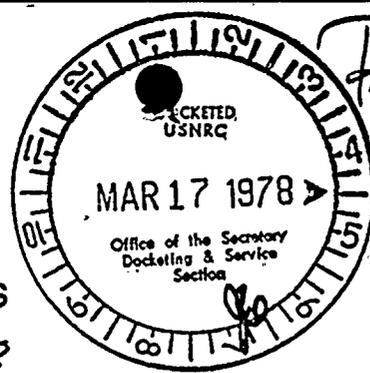


UNION OF CONCERNED SCIENTISTS



Reg. Files

3/20/78

March 16, 1978

Joseph Hendrie, Chairman
Peter Bradford
Victor Gilinsky
Richard Kennedy
Commissioners
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Michael C. Farrar, Esq., Chairman
Dr. W. Reed Johnson
Richard S. Salzman, Esq.
Atomic Safety and Licensing Appeal
Board
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Washington, D.C. 20555

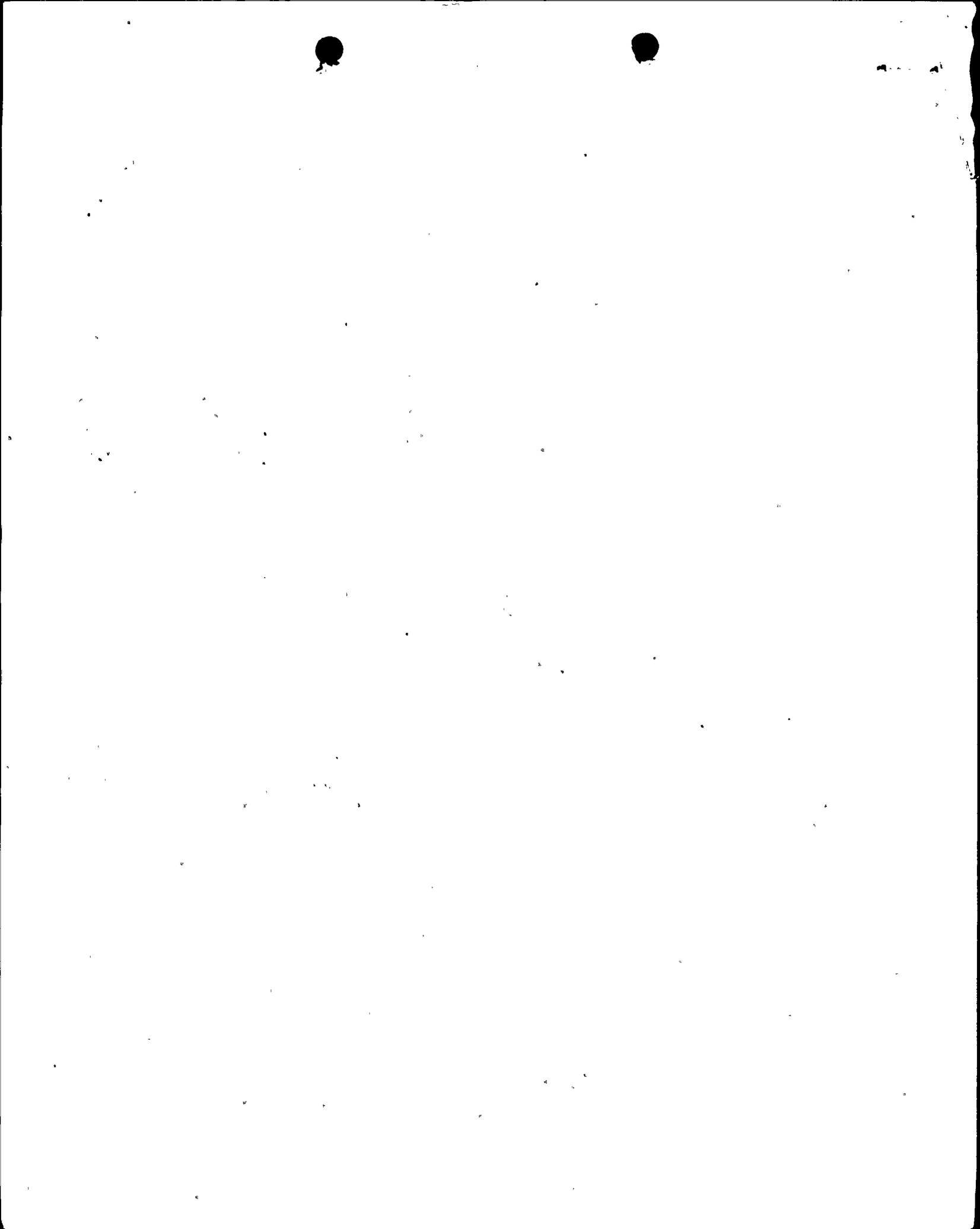
RE: Florida Power and Light Company
(St. Lucie Nuclear Power Plant, Unit 2)
Docket No. 50-389

Gentlemen:

On October 13, 1977, I wrote to Attorney General Bell recommending that the Department of Justice pursue the broader implications flowing from its investigation of official misconduct in the licensing of the North Anna nuclear plants. I offered two specific examples which I believe illustrate a pattern of suppression of information concerning safety hazards at nuclear plants.

In particular, I outlined the Atomic Energy Commission's successful efforts to exclude from the St. Lucie Safety Evaluation Report, and thus from the attention of the public and the Licensing Board, information concerning the chronic grid instability problems in Florida. These problems had caused repeated loss of offsite power to the Turkey Point nuclear facility. In addition, I discussed the design defect in safety systems which results from interaction of control and protection systems. The hazards of this defect were illustrated by an "incident" at the Zion nuclear facility on July 12, 1977, when the disabling of control systems resulted in water being drained from the reactor cooling system and simultaneously disabled all portions of the automatic protection systems capable of detecting the loss of water. I attached AEC/NRC documents to my letter to substantiate both the St. Lucie and the Zion examples.

My letter to the Attorney General was forwarded to the Appeal Board for St. Lucie and to the parties by the NRC staff. I am not a party to these proceedings. On October 28, 1977, the Appeal Board issued an order announcing that it would retain "...jurisdiction over the specific matters raised in Mr. Pollard's letter insofar as they concern this facility [St. Lucie]." On November 3, 1977, the Commission issued an order announcing that it had "...directed its Office of Inspector and Auditor to conduct a thorough investigation into the allegations of



of improper employee behavior." Then in its memorandum of November 25, 1977, the Appeal Board stated that, to avoid duplication of effort, "...pending our receipt of the [Office of Inspector and Auditor] report, we will not proceed further with our own inquiry into those allegations which will be covered by the forthcoming investigation."

I am writing now to bring two matters to your attention. First, I have been interviewed by the Office of Inspector and Auditor (OIA) and have seen the "Memorandum of Interview" prepared by the investigators. I have grave reservations about the OIA investigation and believe it is appropriate to share them with you. Second, I wish to clarify that the design defect illustrated by the Zion incident - interaction of control and protection systems - is a safety problem that is applicable to the Combustion Engineering design as well as the Westinghouse design. Therefore, I believe that the Appeal Board acted prematurely in apparently concluding that this problem does not apply to St. Lucie.

The Investigation of Concealment of Offsite Power Stability Problems During the Licensing of St. Lucie.

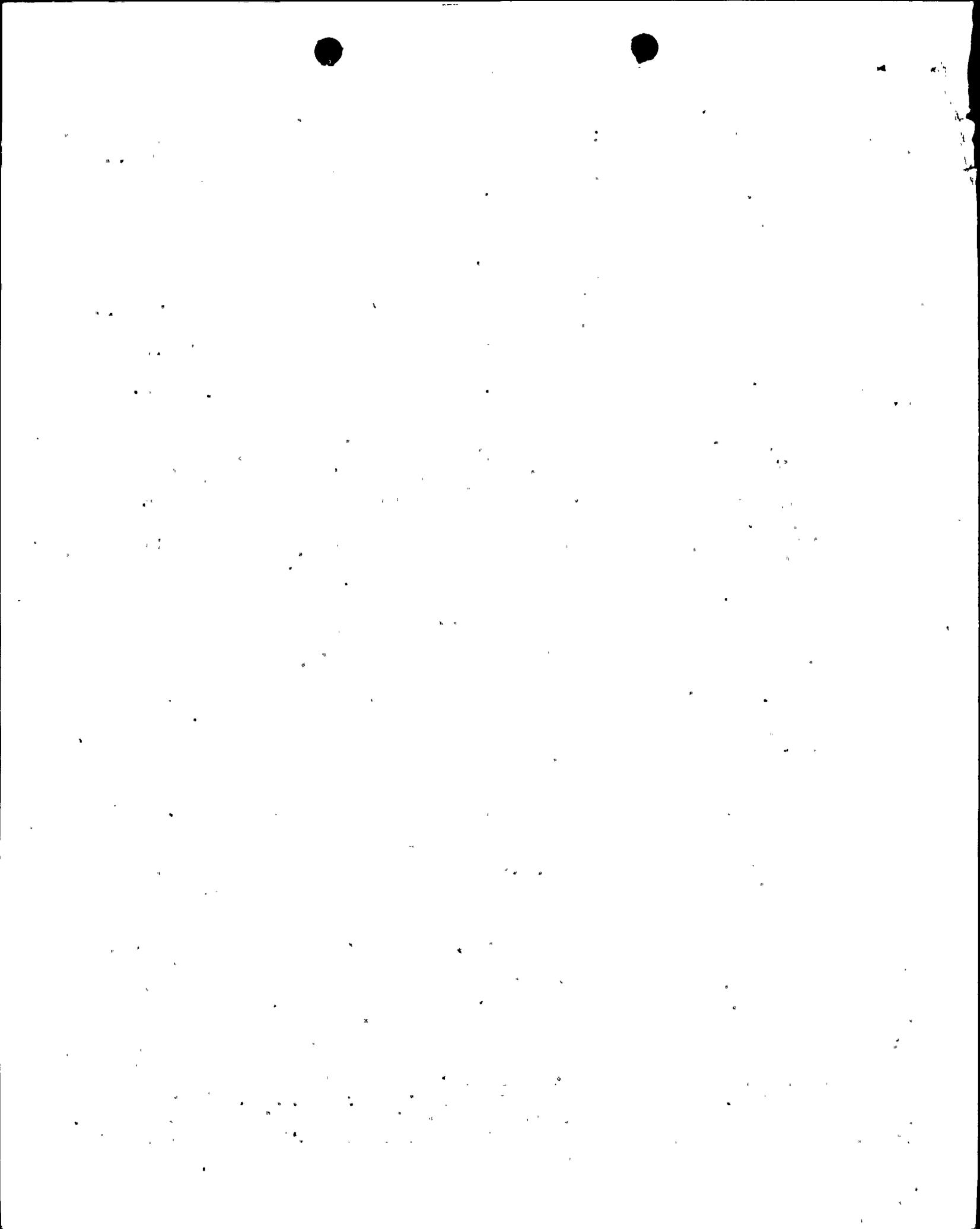
There are two separable issues before the Appeal Board now:

1. Did the staff fail to disclose to the St. Lucie Atomic Safety and Licensing Board information known to it which indicated offsite power reliability problems?
2. Is the electrical grid in Florida adequate to meet applicable NRC regulations concerning offsite power systems?

As to the first issue, I do not believe that there is room for reasonable doubt. The internal NRC memorandum from Mr. Parr to Mr. Giambusso of August 14, 1974, was sent with my letter to the Attorney General and is attached here for your convenience. This memorandum makes it abundantly clear that the staff had reason to believe that the grid instability experienced at Turkey Point could affect the St. Lucie site as well. The memorandum also makes it clear that, because of upcoming contested hearings on St. Lucie, the staff deliberately undertook "...to restrict the investigation [of electrical grid problems] to Turkey Point 3 and 4 if at all possible." No mention whatsoever of the grid problems appeared in the St. Lucie Safety Evaluation Report issued by the staff in November 1974. Finally, on May 16, 1977 ^{1/}, the St. Lucie site experienced a total loss of offsite power which, according to Florida Power and Light Company, "...was associated with a FP&L grid disturbance." ^{2/}

^{1/} The date (May 12, 1977) specified in my letter to the Attorney General is incorrect.

^{2/} Licensee Event Report, Reportable Occurrence 335-77-26, Florida Power and Light Company letter to NRC dated June 16, 1977.



Stability of the offsite power supply in the event of a "grid disturbance" is precisely the issue that the staff had deliberately failed to bring to the attention of the Licensing Board and the public during the contested hearings.

On January 12, 1978, I was interviewed by two investigators from OIA. I requested permission to record the interview. A few weeks later I received a copy of their "Memorandum of Interview." So that you may compare the investigators' report of the interview with what actually took place, a copy of their "Memorandum of Interview" and a transcript of the recorded interview are attached. I apologize for the poor recording equipment that made portions of the discussion inaudible.

As you will note from the transcript, I made the following points, among others, during the interview:

1. I have no documentation concerning St. Lucie other than that which I referenced in my letter to the Attorney General or others referenced in the 1976 hearings and correspondence with the Senate Government Operations Committee. In the latter case, some of the referenced documents are not in my possession because NRC denied Freedom of Information Act requests for them.
2. It is clear on the face of the AEC documents I sent to the Attorney General that the staff deliberately restricted its investigation of FP&L grid instability to avoid involving St. Lucie, which was then in the licensing process.
3. Based on my personal knowledge of staff procedures, the staff's statements in safety evaluation reports to the effect that it has evaluated offsite power reliability are misleading. The staff does not perform an independent evaluation. The routine procedure is simply to parrot back the assertions of the applicant and the requirements of the regulations and then "conclude" that the regulations are met.
4. Mr. McDonald and Mr. Srinivasan, the staff members now assigned to write affidavits on the subject of the offsite power for St. Lucie, have little if any expertise to evaluate grid stability.

You will also note that the investigators' report of the interview is incomplete, attributes statements to me which I did not make and evidences a knowledge of NRC regulations which is at best superficial. For example, the "Memorandum of Interview" is devoid of any mention of the discussion concerning staff members' lack of trust in OIA and its Director, Thomas McTiernan, and concerning other investigatory avenues such as the timing of the technical assistance contract with Oak Ridge National Laboratory concerning offsite power systems. The interview report also claims that I "indicated that no one in the NRC was qualified to look at Offsite Power Systems...." From page 4 of the transcript it can be seen that I modified this statement by saying,



"other than Mr. [Evangelos] Marinos and maybe one other person." Neither Mr. McDonald nor Mr. Srinivasan, is the other person I had in mind. Furthermore, you should be aware that Mr. Marinos was summarily reassigned to another division when, in accordance with the ethics of the engineering profession and the Code of Ethics for Government Service, he expressed his professional views on technical matters such as offsite power systems. As a final example of the inadequacies evidenced by the OIA interview report, consider the statement that begins "Mr. Pollard stated that both the Regulations and GDC 17 have requirements....." First of all, I did not make that statement. Secondly, only persons with either no knowledge or superficial knowledge of NRC regulations would refer to GDC 17 as if it were not part of the regulations.

Aside from the information I provided, the interview transcript contains information from which you can gain some insight concerning the scope and adequacy of the OIA investigation. You will note that the investigators had been previously told, apparently by someone within NRC, that evaluation of offsite power reliability is not a function of the staff—that the staff simply accepts the word of the Federal Power Commission. The investigators kept coming back to this theme of non-responsibility. This is a particularly pernicious distortion of the facts. None of the technical staff, including myself when I was a Reactor Engineer and later a Project Manager with NRC, were ever informed that the staff had any less legal responsibility in this area of the technical review than any other. Furthermore, the safety evaluation reports submitted to Licensing Boards have never claimed that NRC had delegated its authority and responsibility. Safety evaluation reports simply state that the staff concludes that the offsite power system design meets the regulations.

You will further note that the investigators were also very interested in what the procedures were in 1974 for submitting information to Licensing Boards. The investigators appeared to be completely unaware of a decision by the Appeal Board on September 6, 1973 in the proceeding for McGuire nuclear plants in North Carolina. By that decision, the staff was admonished to notify Licensing Boards promptly of any information that is relevant and material so that the decisionmaking process would be based on evidence accurately reflecting existing facts. The investigators also seem unaware of the fact that the testimony of Mr. Lee Gossick, Executive Director for Operations, before the Senate Committee on Environment and Public Works on October 13, 1977, concerning staff procedures allegedly used following the 1973 McGuire decision is directly contradicted by the staff's conduct in 1974 during the St. Lucie licensing process. OIA does not appear to grasp the overriding significance of the fact at that very time the St. Lucie Safety Evaluation Report was being prepared, Mr. Parr was recommending restriction of the grid stability investigation. Thus, what is involved is clearly not a misapprehension of the staff's relationship to Licensing Boards, but a deliberate action to subvert the review. The investigators appear determined to locate "evidence" suggesting that withholding relevant and material information from the St. Lucie Licensing Board and the public was proper conduct.



11

In summary, I am disturbed by the direction, or lack thereof, of the OIA investigation. It seems to me to be infected from the outset by preconceived notions and a misunderstood mission. That is the charitable interpretation.

I believe that the investigation should be conducted by the Justice Department rather than NRC, particularly in this case where the Commission acknowledges that the investigation may reveal "criminal violations." ^{3/} However, if the Appeal Board and the Commission have decided to have the agency investigate itself, I respectfully suggest that there are far superior investigatory methods that should be used instead of those being used by OIA.

Each person on the distribution list for Mr. Parr's memorandum, each person who concurred in the memorandum and each person who wrote, approved, or was otherwise responsible for the part of the St. Lucie Safety Evaluation Report concerning offsite power should be questioned orally under oath. This includes former employees of the AEC/NRC. The individuals should be questioned along the following lines and should not be permitted any access to the other individuals' answers until all depositions are completed:

1. Why did you concur in or approve Mr. Parr's memorandum?
2. Did you have any reservations about the action recommended in that memorandum? If so, to whom did you communicate them and what was the result? If you did have reservations and did not express them, explain why.
3. Why did you not take steps to see that the offsite power system was evaluated by the staff or at least take steps to assure that the instability problem was identified in the Safety Evaluation Report given that there was "reason to believe" that it "could very well involve the St. Lucie site?"

Other obvious lines of questioning will occur to anyone genuinely interested in determining whether criminal violations occurred.

With respect to the technical issue of whether the Florida grid meets the Commission's regulations, any investigation must consider the following possibilities:

1. The testimony of staff's witnesses as well as the applicant's may be self-serving.
2. Even if one assumes that the staff's testimony represents the whole truth to the best of the affiant's knowledge, the witness may have inadequate expertise in the area of large power system analyses.

^{3/} Commission Order in the matter of Florida Power and Light Company, St. Lucie Unit 2, Docket No. 50-389, November 8, 1977.



Examination of the AEC/NRC documents concerning St. Lucie which I attached to my letter to the Attorney General and the documents which the staff sent to the Appeal Board after my letter shows that these are real and not fanciful possibilities. For example, the statements of professional qualifications submitted to the Appeal Board by M. Srinivasan and Daniel G. McDonald, Jr. in support of their report, "A Further Evaluation of the Florida Power and Light Company Electric Power System," show their lack of expertise on this subject. A substantial part of the qualification statements discusses only the responsibilities of the NRC branches to which the affiants are or were assigned. What little specific information is provided concerning their formal education and previous work experiences does not concern analysis of large power networks such as the Florida grid. I reiterate that, based on their recent Professional Qualifications statements and the personal knowledge I gained working in the same AEC branch with the affiants, it is my belief that they are not expert in the subject of grid analyses and that their testimony should not be the basis for a conclusion by you that the grid stability problems have been solved. I further believe that Mr. McDonald's assignment as Task Manager for Task Action Plan A-35, "Adequacy of Offsite Power Systems", which is a category 'A' unresolved safety problem 4/, is indicative of the staff's lack of commitment to thorough, competent appraisal and resolution of serious safety hazards before licenses are issued.

Mr. McDonald's and Mr. Srinivasan's joint report which was submitted to the Appeal Board by staff counsel on October 25, 1977, consists mainly of generic or background information. Their "Preliminary Assessment" 5/ of the loss of offsite power "event" which occurred on May 16, 1977, is at best indefensible and at worst disingenuous. They conclude that the loss of Turkey Point Unit 3 caused a temporary 6-minute grid instability condition from which the system recovered. The transmission line failure 10 minutes later which resulted "in the breakup of the FP&L system" and the loss of offsite power is treated as a separate, unrelated event. On this basis they conclude that the system satisfies the regulations. This is analogous to a situation where the regulations require a man survive a fall from the top of a 30-floor building. When the man fails to do so, the regulator replies that the regulations are nevertheless met. He survived the fall; it was the impact on the ground that killed him.

4/ See NUREG 0410, "NRC Program for the Resolution of Generic Issues Related to Nuclear Power Plants," a report to Congress dated January 1, 1978.

5/ See "A Further Evaluation of the Florida Power and Light Company Electric Power System," Pages 18-19.



Interaction Between Control and Protection Systems

The interaction between control systems and protection systems is a complex subject, but the substantial hazards to public health and safety posed by such interactions are well known. The term "control systems" refers to non-safety systems that are used during normal operation of a nuclear plant. The term, "protection systems" refers to safety systems that are used in an emergency such as would arise if the control systems failed to keep plant operation within safe limits. The possible causes of unacceptable interactions between control and protection systems are innumerable.

As one clear example, consider a design where the same equipment is used for both systems. A failure in the common equipment can cause the control system to place the plant in an unsafe condition and simultaneously prevent the protection system from correcting that unsafe condition. This is precisely what caused the Zion "incident" on July 12, 1977. Dummy (false) signals were fed into equipment used for both control and protection. The signals indicated there was more water in the reactor cooling system than there actually was. These false signals caused the control system to reduce the rate of water addition to the reactor cooling system but the rate of water removal from the system remained constant. The same false signals were fed to the protection system, preventing detection of the net loss of water from the cooling system. Compounding the problem, the same false signals were also fed to the water level meters in the control room. Fortunately, the operators detected and corrected the situation in time, but it took three licensed reactor operators over half an hour to do so.

The preceding is not intended to be a complete discussion of the hazards of interaction between control and protection system. More information is contained in the documents attached to my letter to the Attorney General. It should also be noted that "Systems Interactions in Nuclear Power Plants" is a category 'A' unresolved safety problem for which no solution is anticipated before December 30, 1978. ^{6/} The time required to implement the solution and the feasibility of implementing the solution in a partially or completely constructed plant are of course unknown.

In order that you may have the benefit of another view on this subject, I am enclosing a copy of a memorandum dated August 30, 1977, by Elbert P. Epler, a nuclear systems consultant to the Advisory Committee on Reactor Safeguards (ACRS). Mr. Epler treats the problem of interaction between control and protection systems in detail and concludes that "[t]he true nature of the problem is so little understood that we can not be assured of an adequate defense." It is also important to note that Mr. Epler believes that the present regulatory requirements are inadequate.^{7/} He recommends that "... the applicant be required to

^{6/} NUREG-0410, op. cit.

^{7/} The principal regulatory requirements are the Institute of Electrical and Electronics Engineers Standard, IEEE 279, which is incorporated in 10CFR 50.55a and General Design Criterion 24 (GDC 24) of Appendix A to 10 CFR Part 50.



provide evidence that precautions beyond the requirements of IEEE 279 and GDC 24 have been given consideration." This is almost identical to the conclusion reached by Dr. Hanauer: "I also don't know (and don't much care) whether the interaction, whatever its nature, is allowed by the various meticulously crafted clauses in IEEE-279." 8/ In view of these two opinions, among other things, I respectfully suggest that the Appeal Board and the Commission require the staff to address itself to the following questions:

1. Is conformance with the current regulations sufficient basis for concluding that the public health and safety is adequately protected?
2. Are the scope and timing of the staff's plans for resolution of this safety problem appropriate?

In my considered judgement, the answer to both questions is "no". I agree with the opinion Dr. Hanauer held before his memorandum of August 18, 1977 to Mr. Case became available to the public - the present designs are unsafe. 9/

Regarding the relevance of this problem to the St. Lucie plant, I stated above my belief that the Appeal Board had acted prematurely in apparently concluding that it does not apply to St. Lucie. In its order of October 28, 1977, the Appeal Board stated:

"The other specific allegation in Mr. Pollard's letter pertains to aspects of 'Westinghouse-designed' plants. The St. Lucie facility is of Combustion Engineering design. *** ...our decision of October 7, 1977 (ALAB-435, 6 NRC _____), affirming the Licensing Board's decision authorizing a construction permit for Unit No. 2 of the St. Lucie facility... is amended to reflect our retention ...of jurisdiction over the specific matters raised in Mr. Pollard's letter insofar as they concern this facility." (emphasis added)

8/ Memorandum from Stephen H. Hanauer to E.G. Case, "Interaction Between Control System and Protection System", August 18, 1977. (A copy of this memorandum was attached to my letter to the Attorney General.)

9/ I have difficulty accepting that the staff's Task Action Plan for resolving this generic safety problem, which has concerned Dr. Hanauer for years, first came to Dr. Hanauer's attention when he received Mr. Case's reply dated September 23, 1977. In any case, I believe that the soothing reassurances and abrupt change in outlook evidenced by Mr. Case's memorandum of September 23, 1977, and Dr. Hanauer's subsequent memorandum of September 28, 1977, are largely the result of the staff becoming aware that I had Dr. Hanauer's memorandum of August 18, 1977. (All these memoranda were attached to my letter to the Attorney General.)



In my letter to the Attorney General I used the term "Westinghouse-designed" because my summary of the documents attached to that letter focused on the Zion "incident". The Zion plant is of Westinghouse design. However, you will note that in Dr. Hanauer's memorandum of August 18, 1977, he stated:

"The acceptability of all systems, Westinghouse and non-Westinghouse, old and new, needs to be reviewed in the light of the Zion event and any unacceptable interactions removed."

In my letter to Dr. Hanauer dated September 16, 1977, I stated:

"After reviewing the licensee's Reportable Occurrence Report dated July 25, 1977, I agree with your conclusions that the design is unsafe and that the acceptability of all systems in all plants needs to be reviewed in the light of the Zion event."

Finally, you will note from the enclosed memorandum that Mr. Epler expresses his particular concern with interactions between control and protection systems in the Arkansas Power and Light Company's nuclear plant. That plant is of Combustion Engineering design. Therefore, I do not believe the Appeal Board can dismiss this problem on the basis that it does not concern the St. Lucie facility.

If the staff of Florida Power and Light Company seeks to dismiss this issue from consideration in the St. Lucie proceeding on the basis that the particular design proposed for the Arkansas plant has not been proposed for St. Lucie, you should be aware of the following facts. The design for the Arkansas plant was changed after the construction permit was issued. The staff member assigned to review the new design was restricted to evaluating the design against criteria approved at the construction permit stage, when it was not known that the design would include such an extensive potential for adverse control-protection interactions.^{10/}

I suggest that the Appeal Board can determine the extent of the problem in the St. Lucie plant by requiring the staff to address itself to the following questions, with opportunity for the parties to comment as appropriate:

1. How are the current regulations concerning the separation of protection and control systems met in the St. Lucie design?
2. If the detailed design is not available, what is the basis for concluding that conformance with the current regulations will provide adequate protection of the public health and safety?

^{10/} There are persons who will disagree that this statement is a fact. You can refer to the information produced and referenced in the hearings before Senate Government Operations Committee in 1976.



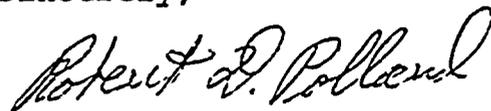
3. The final design for St. Lucie may not yet be available or may be changed following the Appeal Board's affirmation of the decision authorizing the construction permit. What specific criteria will be used to determine whether the design, when it becomes available or is changed, constitutes a change to the "principal architectural and engineering criteria" on which issuance of the construction permit was authorized?

I wish to alert the Appeal Board to the potential pitfalls of a staff response to such questions along the following lines: "Whatever is required on the Arkansas plant [or some other plant] will also be required on the St. Lucie plant." Without prejudging future staff action on the Arkansas plant or any other, I can state my past observations and experiences as a staff member. The staff has frequently approved features during an operating license review that it would not have approved during the construction permit review. Unless one has personally experienced them, it may be difficult to appreciate the pressures brought to bear on the staff by a completed plant which is awaiting an operating license and which is costing hundreds of thousands of dollars a day in interest charges alone. The time to settle safety questions on St. Lucie is now, before construction proceeds any further. In this regard, the St. Lucie parties and, if the Appeal Board remands this proceeding, the Licensing Board should find the Appeal Board's decisions in River Bend (ALAB-444, November 23, 1977) and Midland (ALAB-458, February 14, 1978) instructive.

I am sending copies of this letter to the parties in this proceeding. If I have inadvertently omitted any, I trust the Appeal Board will take steps to rectify my error.

I am willing to assist the Appeal Board and the Commission in the resolution of the problems discussed here. Their resolution is not only vital to protecting the public health and safety, but also to earning the public's confidence in the regulatory process.

Sincerely,



Robert D. Pollard
Nuclear Safety Engineer

Enclosures and cc:

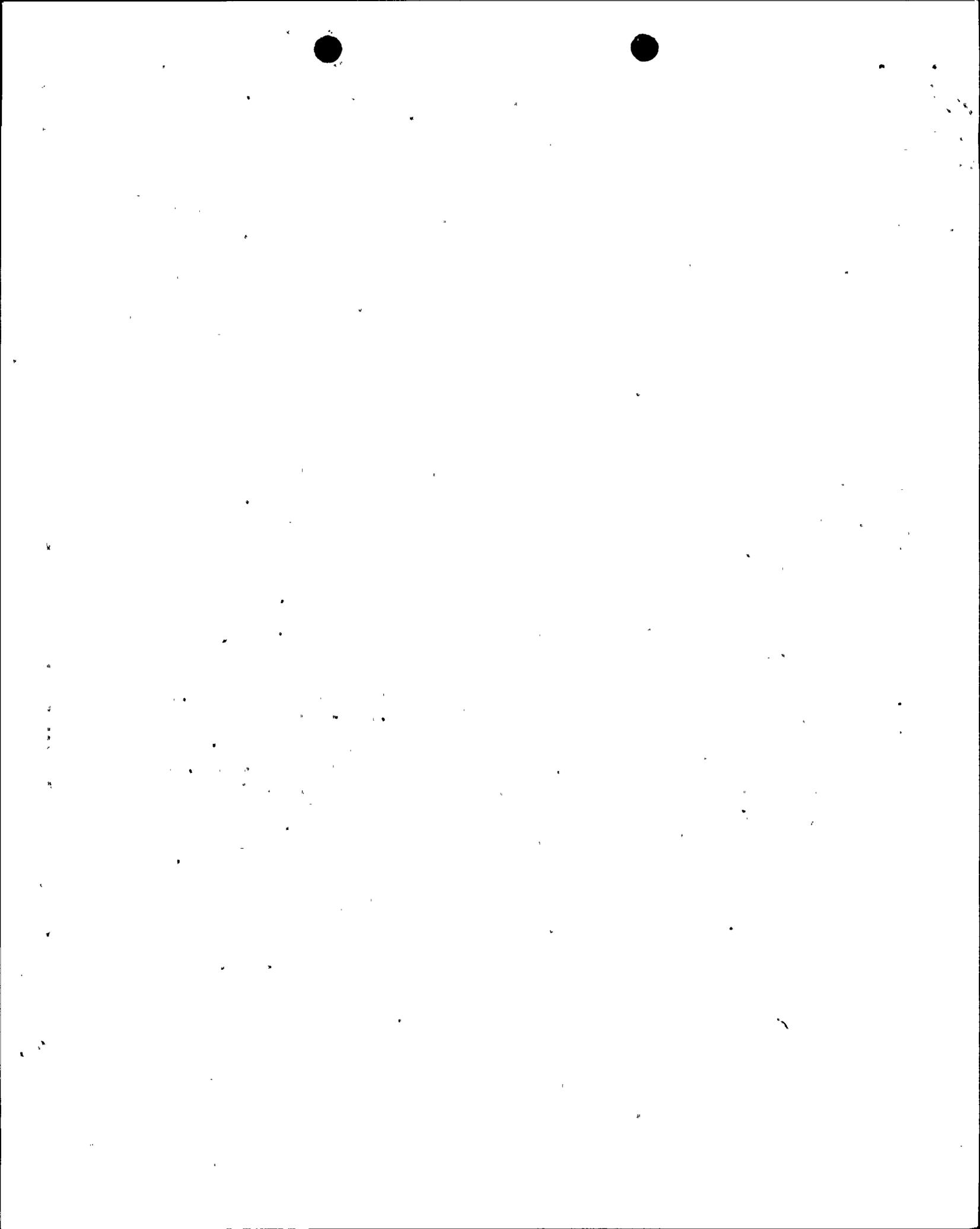
SEE PAGE 11

Enclosures:

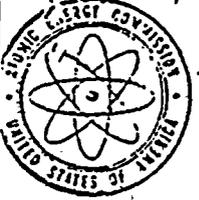
1. AEC Memorandum from Olan D. Parr to A. Giambusso, "Electrical Grid Stability in State of Florida", August 14, 1974.
2. Transcript of January 12, 1978 Interview of Robert Pollard, UCS, by NRC Office of Inspector and Auditor.
3. "Memorandum of Interview", NRC Office of Inspector and Auditor, undated. (Received by R. Pollard on February 1, 1978)
4. Memorandum to William Kerr, ACRS, from Elbert P. Epler, nuclear systems consultant, August 30, 1977.

cc w/enclosures:

Norman A. Coll, Esq.
Martin H. Hodder, Esq.
William D. Paton, Esq.



Supp



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

AUG 14 1974

Docket Nos. 50-335
and 50-389

Tonki
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replied?
2/13/74

A. Giambusso, Deputy Director for Reactor Projects, L
THRU: R. C. DeYoung, Assistant Director for Light Water Reactors Group 1, L

ELECTRICAL GRID STABILITY IN STATE OF FLORIDA

I understand that Mr. Muntzing has requested the staff to investigate electrical grid problems that have been experienced by Florida Power and Light Company (FP&L), including those affecting Turkey Point 3 and 4. The EI&CS Branch will be conducting the investigation under the direction of Vic Stello and has made initial contacts with FP&L. It is not clear as to the extent of the instability; however, there is reason to believe that it may have been experienced further north. The investigation could very well involve the St. Lucie site. This concerns us as our St. Lucie 1 (OL) and St. Lucie 2 (CP) reviews are nearing completion and we have a contested LWA-1 and LWA-2 hearing scheduled to begin on October 15, 1974. OGC suggests and we concur that if the St. Lucie site becomes involved, the St. Lucie 2 intervenor should be notified of subsequent meetings and that the establishment of the ongoing investigation should be noted in the St. Lucie 1/2 SERs. We would like to restrict the investigation to Turkey Point 3 and 4 if at all possible.

Dr. Robert Uhrig, Vice President of FP&L, has expressed concern as to the scope and direction of the investigation as he is also concerned with the St. Lucie hearing. He noted that even though only FP&L will be involved initially, other Florida utilities could become involved and possibly other regions. The Florida Power Corporation is of particular interest due to its interties with FP&L and Georgia Power. An interface with the Federal Power Commission interests could also evolve. Dr. Uhrig suggested that there are published reports which discuss the FP&L grid stability and that perhaps the staff might wish to become familiar with this information before meeting with FP&L.





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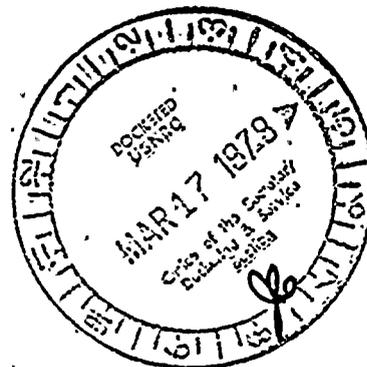
Based on the above, I would like to suggest the following two steps:

1. That Mr. Muntzing be made aware of our concern with regard. to the St. Lucie hearing and of our desire to restrict the EI&CS investigation to Turkey Point 3 and 4.
2. That the EI&CS Branch review the available information with regard to FP&L grid instability before meeting with FP&L.

Olan D. Parr
Olan D. Parr, Chief
Light Water Reactors
Project Branch 1-3
Directorate of Licensing

cc: E. G. Case
R. S. Boyd
F. Schroeder
V. Stello
V. Moore
K. Goller
T. Ippolito
C. Miller
P. Seiffert

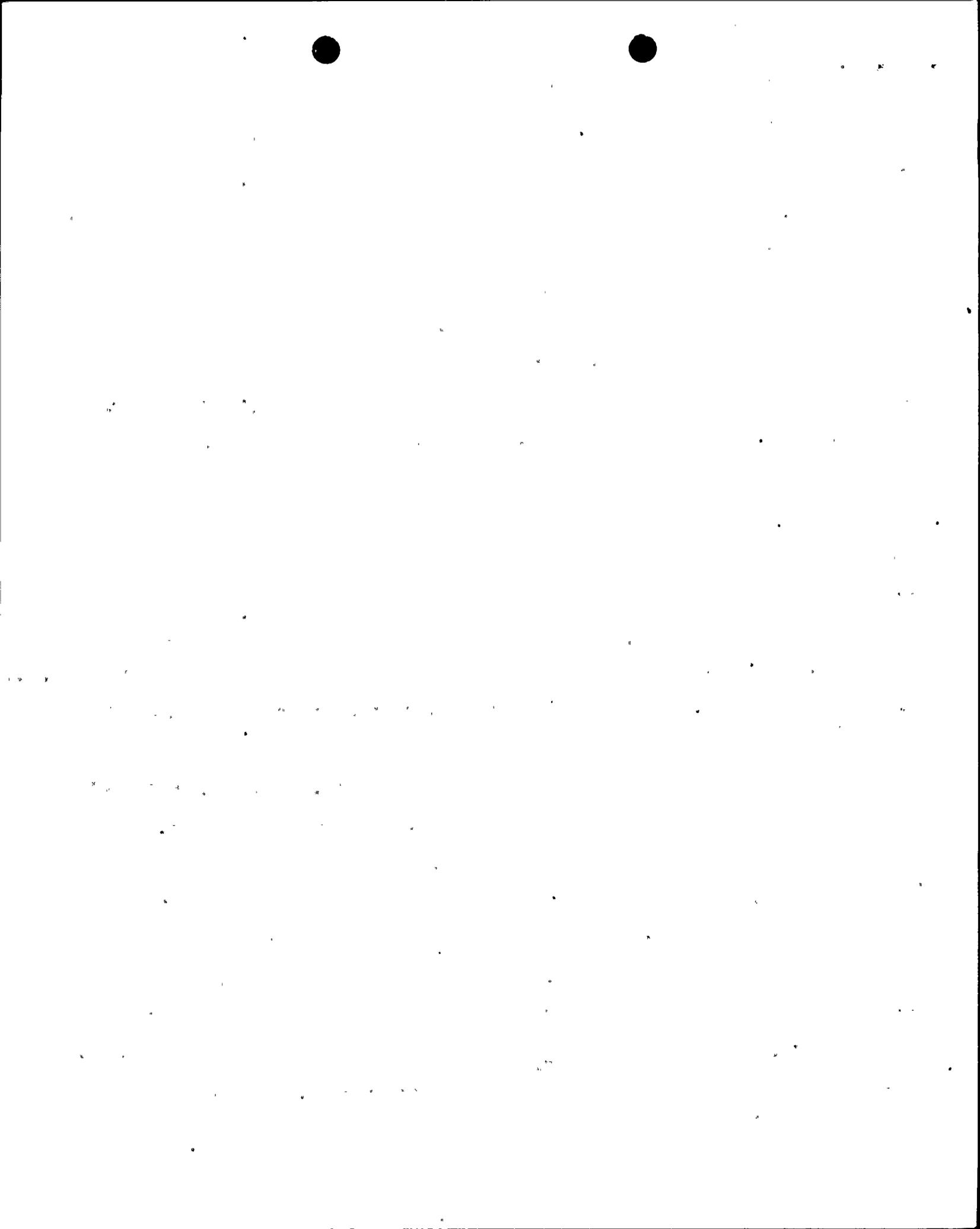




Transcript of January 12, 1978 Interview of
Robert D. Pollard, Union of Concerned Scientists

by

NRC Office of Inspector and Auditor



POLLARD:(inaudible).. investigating a chicken house, you know so.....

DONOVAN: Well--the only thing that I think we wanted to cover is just that in your letter to the Attorney General, you stated that you thought there was a ... might be additional cause for... to look into the problems at Turkey Point or St. Lucie, in the licensing of St. Lucie, there were certain problems there and that this was just an extension of the overall problems of the whole licensing problem with AEC/NRC. And in using that example of St. Lucie, talking about accommodating problems at Turkey Point and that you felt that this being part of the same utility(inaudible).. may not... whatever, you know, that they didn't do all that was necessary to satisfy the, I guess the regulatory requirements in licensing St. Lucie. My only point would be is to, other than that August memo that you submitted I guess along with thewith your letter, if you had any other evidence or knowledge as to any.. any kind of improprieties as might have occurred in the licensing of St. Lucie?

POLLARD: I don't know if my writing is that bad, but I don't get that impression from my letter. What I was saying to Attorney General Bell first of all started from North Anna, where they concluded that the staff's conduct bordered on criminal negligence and other such things. What my statements were it seems to me that these conclusions would be equally applicable in many other instances and I provided two examples, one dealing with St. Lucie and one dealing with the generic problem. I didn't mean to imply nor I don't think I said anywhere that you could claim that that I knew of other instances on the St. Lucie plant.

DONOVAN: Well, okay, I mean in the sense that you provided there an example and... I just may be inferring, or based on the knowledge you might of had in regard to St. Lucie, there might be something that should be investigated or looked into.

POLLARD: In particular on St. Lucie?

DONOVAN: Yes.

POLLARD: No, I never worked on St. Lucie so I wouldn't have a basis for knowing that.

DONOVAN: No, but I mean that at least your relationship and the fact that I guess that you included this memo from Parr using that as a basis for probably, you know, possibly inferring that there was a problem there because of what they state in here.

POLLARD: My purpose for using the letter is as I summarized it in the cover letter. What the document indicates is that the Staff deliberately withheld information on the St. Lucie case, dealing... having to do with offsite power systems.

DONOVAN: Would that be the basis of... I mean the full extent of your knowledge of any what you feel might be wrong-doings in the St. Lucie? Just this..this letter?

POLLARD: Well, simply not just that one letter - no. And I think if you see the testimony given before the Senate Government Operations Committee last fall, when they are discussing the generic problem of power grid stability, I think then there they are referring to several documents some of which I've tried to get through FOIA and have been denied. So there are other documents then besides this one that I think were referenced either directly in the testimony or in subsequent correspondence between the people who testified and the committee.

DONOVAN: Last year? When?

POLLARD: It was last fall when Basdekas, Marinos, Calvo...

I don't know, there were six or so.

DONOVAN: Okay

POLLARD AND DONOVAN:(inaudible).

POLLARD: I think there.... I don't believe I have any other documents other than those listed in the testimony and correspondence. It's true that I did not forward all the documents I have relating to this incident to Bell, if that's what your question was.

DONOVAN: No, it...not specifically. I just... we are trying to look into to see if...looking at the licensing of St. Lucie and that whether or not you might have had any other additional information that might help us, you know if-----if this thing got to any greater extent that what it is already, now if it goes to the Justice Department or something like that--I'm sure you're aware, you know, you have to have a lot of evidence to prove that there was something.....(inaudible).. I'm just trying to make sure we get it.

POLLARD: You're getting off to a pretty good start with Parr's memo. Myself--and that's what I've tried to interest the Justice Department into looking into more than just St. Lucie and more than just this one incident. I think for your investigation of this incident, a couple things have occurred to me since the letter--not occurred to me--have developed. One was the affidavits that have been filed with the Board by McDonald and Srinivasan with both of them--well, one's now in Power Systems Branch and the other one's in still the electrical branch.

POLLARD AND DONOVAN: ..(question and answer inaudible)..



POLLARD: Now, part of my problem in general with McTiernan's organization.....(inaudible)..is to just try and track down who did what to whom and when, misses some of the points. For example, if you look into those affidavits of Srinivasan and McDonald particularly at the content of the affidavit with respect to any statements about an actual evaluation of this Florida power grid, you'll find the ponderance of the discussion is of a generic nature. The second point about this, if you look at the qualification statements of McDonald and Srinivasan, you will find that at best in McDonald's case, his only qualification for doing this is that he has been assigned to do it. He has no training in power systems evaluation. Srinivasan apparently has some stronger training with respect to looking at the distribution of power within industrial factories, which at least is close, but I'm not sure in any sense of the word you could say that that experience would necessarily qualify him to evaluate offsite power systems.

Another thing you ought to look into, I think, is the relationship between the people speaking out at the Senate Government Operations Committee and the timing of initiating the contract with Oak Ridge National Laboratory to develop computer models for offsite power analysis. I think what you'll find is, other than Mr. Marinos and maybe one other person, from my experience in that Branch there was no one there qualified to evaluate offsite power systems, including myself.

As far as withholding information, throughout the years that we were there, basically what happened on evaluating offsite power systems...if you read the last paragraph of General Design Criterion 17 to see specifically what is required by law or by regulation,



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and then compare that with the information that's contained in the FSAR for St. Lucie I and the PSAR for St. Lucie II, and...I have not done this, so much, but from my experience on my own plants that I reviewed, generally you may have nothing more than one or two sentences from the utility that more or less paraphrases the regulation saying, in a positive sense, "we have evaluated the system for loss of the largest power generating station and conclude that the system remains stable." That was the end of the review. You simply took that statement and repeated it again in your safety evaluation report. There was never any evaluation, generally, as to the adequacy of offsite power systems and I think this is because nobody knew how to do it. In fact, I noticed in some of Mr. Marinos' testimony he made references to supervisors who told him not to look into information about offsite power systems because we wouldn't know what to do with it. That's almost my exact words to him. When he first came there, he was assigned to me for, I guess you'd call it, orientation training, to try to help him along. I was not a supervisor. But I remember this came up on one of his plants. He wanted to write a question getting the details of the offsite power system analysis and I kept saying "no, we don't know what we were going to do with the answer." That's more or less what I told him, because up until that time nobody had ever looked at offsite power systems.

DONOVAN: I think that's pronounced, the name, Srinivasan.

POLLARD: I think it's Srinivasan is how I used to pronounce it when I was there. Anyway there is only one of them.

DONOVAN: Yes. I think in that affidavit he stated something to the extent that the Federal Power Commission or the Southeastern Reliability Council are the ones who actually make the analysis.

Based on this to the whole question about who actually makes the analysis, and it's apparently not NRC, it's the utility, I guess with the aid of Southeastern Reliability Council which is one of nine Councils of FPC, I guess it is... They actually make this analysis, but I think by law they are responsible for determining the reliabilities. But I'm not sure to what extent that NRC is supposed to evaluate that analysis to ...I guess they're supposed to evaluate it to make sure that it does meet the intent of the General Design Criteria.

POLLARD: Well that's certainly what they say in the safety evaluation report--they have done that evaluation. If you look at the... I mean, they've concluded, the NRC Staff has concluded, without mentioning somebody else's analysis other than utilities, that the system meets the regulation. From the...for the record of Florida, it appears that it doesn't. That's just the point.

DONOVAN: Do you know how far back that this whole thing about grid analysis was required?

POLLARD: Well, the GDC that are now in existence were formalized in 1971. And prior to that, I think in 1968, they had what were called proposed General Design Criteria and we had been using those from the time I came there until the other ones were published in '71. And there were some changes in wording between the proposed version and the adopted version of '71, but the thought was still there. I remember one of the significant changes we made in the original draft wording more or less required power availability. We reworded it to require the availability of transmission lines, because there's no way you can legislate that the transmission lines would be energized. So, I mean that kind of wording changes occurred, but the criteria have been around a long time.



DONOVAN: ... (inaudible) ... way back in '71, it was the intent of the regulation to have some kind of an analysis made of that grid stability?

POLLARD: Yes. Now, I was looking over again this morning to refresh my memory, what does the standard review plan require the applicants to send in and what does the--I mean the standard format-- and what does the standard review plan require the staff to do? And your suggestion that this evaluation is done by some other organization is definitely not part of what the standard review plan says the staff is doing or supposed to be doing.

AUERBACH: The intent... Well, I won't say the intent. Our understanding, by getting some background knowledge, is that the NRC, their legislative or their jurisdictional area is not power grid systems or bulk power grid systems and that the Federal Power Commission, that's their charter, and they would have information concerning.. they gather information concerning the reliability of bulk grid systems and things of that nature. The NRC will request this information from the licensee but that the NRC itself does not concern itself with possessing that fact.

POLLARD: It sounds to me as if somebody's trying to explain away a bad situation because this was never told to any of the people like me who review plants. The law says the NRC is responsible for assuring that it's stable enough. Now if they decide it's not stable enough, it's probably true they don't have the power to tell them to reroute transmission lines, but they do have the power and the responsibility to deny the license.



AUERBACH: I'm not stating that point.

POLLARD: Okay, well as long as we understand who's playing for who. But, I mean all of these statements that you are saying are probably true now, but that was certainly was not the understanding that we were operating under and it's certainly not what's stated in safety evaluation reports and besides all that's got nothing do with whether or not the Staff withheld information from that Board.

AUERBACH: Okay, I'd like to ask you a question on that. Now not pertaining just to St. Lucie, but generically while you were employed with the Commission, was it standard operating procedure or would the Board have been notified of issues such as these, not necessarily pertaining to offsite power, but any issue that the Staff came up with and had a question on? Or would the Staff wait until it was resolved and then tell the Board one way or the other? Or if it was resolved to the satisfaction of both the Staff and the utility, would the question not have been brought up to the Board at all?

I think Dick and I have been a little unclear of how information was always transmitted to the Board by the Staff.

POLLARD: Here I have to divide my answer into two parts. One when I was working in what is now called the Division of Systems Safety and then when I was in the project management branch. As a general matter, when I was in the technical review area, had little or no idea what the purpose of the hearing board was. I mean it was all sort of something strange that had nothing to do with my work. And so when I saw Mr. Case's letter of October 25th, asking the Staff to tell us things that may have been withheld from hearing boards, I suspect most of people



who got that letter said, "I don't even know what we're supposed to tell the hearing boards. How am I supposed to know whether or not we have withheld anything from them?" Because, as a matter of practice, most of the people in the technical area, unless they have to go and testify, never see the actual filings that go to the board. It was only after I became project manager that I came to understand the relationship between the boards and the whole licensing process and, as a routine matter, saw all of the documents submitted to the board. So in the first area, I couldn't tell you what happens to issues with respect to the board, and I suspect most of the people in the technical area can't answer the question either.

In the project management side, I think there's no one answer as to how issues were handled. It may be best to stick to my own experiences primarily with Catawba and McGuire. McGuire was in for an operating license; Catawba was in for a construction permit. Take McGuire first.

When McGuire called me up, Duke Power Company, to let me know a whole new building was being...a whole extension was being added to the building, auxiliary building, for storage of new fuel in a dry condition, and they were trying to check on criteria that they would have to use, and so on. After reading the construction permit, it was my conclusion that construction of the building was not authorized. And so I checked with the inspector to ask him what was going on and his response, he didn't know anything about it. And he says, "you can't expect me to check everything," and here was a whole new building going up that he didn't even know about. So I wrote some internal memos trying to figure out what to do about this. It was my feeling, reading the



regulations that they would have to apply for an amendment to the construction permit. What happened inside at first--Oh, I wish I could remember his name. Maybe if I look through the phone book I can remember but the attorney assigned to McGuire at the time originally agreed with me, that it appeared that they were not authorized to undertake this work and needed to have amendment to the construction permit. Subsequently, because of a decision that was made on another plant, the idea...it fell back upon the letter of the regulation that said you do need not apply for a amendment unless you change the principal architectural and engineering design criteria. Now what that phrase means, I don't know. I'm not sure anyone in the Commission knows, but in any case it was decided not to require any changes. And so what we did with McGuire was simply let the whole thing go through the process of the operating licensing review. Now I presume, and I don't know because I left in the interim, that in the safety evaluation for McGuire, they never pointed out to the Board this was a change from the construction permit.

In the Catawba case, almost 30 days to the day after they received their construction permit, they told us about the discovery of a geologic fault on the site. That as far as I know, and I could be wrong, was never brought to the attention of the Board, because at that point the Board had already issued its decision and a construction permit had been issued. What bothered me about the circumstances was that Duke Power Company had known about the situation for something like two months before the construction permit and some three months before they bothered to tell us about it. And I think I even talked about that subject before in my testimony before Joint Committee when I



resigned. Because we tried to draft a letter then to send to Duke to investigate this and it was all changed, somewhere up near Rusche's level, to make it a very mild letter and not take any action. As far as I know, it was not brought to the attention of the Boards.

AUERBACH: Well, were there any routine documents that the Boards would get distribution of other than like the SERs and the very you know, big formalized documents that came in? Were there things that occurred in NRR, documents that would be generated within, or that float into-or out of NRR that would....

POLLARD: That routinely go to Boards?

AUERBACH: That routinely go to the Boards?

POLLARD: Not that I know of. Generally if something happened.. I'm trying to remember. One good thing I think you could look into to answer this question--maybe my memory is getting bad as to which documents went to Boards and which didn't--but you can look into the discovery of the problem on the reactor vessel supports. That first came up, I believe, on Beaver Valley and that was the subject of the hearing on Beaver Valley and so that the Board, I'm sure, was notified. It might be interesting to find out, if at that time, whether all licensing boards were notified of this problem with the reactor vessel supports. I think they now have been, but you could look at the time period between when it first came up and when it went to the Boards, maybe that would give you some indication....

DONOVAN: As I said, our main purpose was really just see if maybe we could get the same amount of insite into the extent of the problem of approval, this feasibility problem, specifically I guess related with St. Lucie.



POLLARD: Not all the other documents that have already been mentioned in testimony.

DONOVAN: Well, that's really about it. I guess we just felt it necessary to come down and maybe touch base with you, and that.....

POLLARD: I am becoming a little cynical. My feeling is you came down just to make... to be sure you said you came down.

DONOVAN: No.

POLLARD: I have trouble with this agency at this point, and one of the problems I have-----and I know it's unrelated to your current investigation..... I have people coming to me with information, not just from NRC, from the industry, which is one of the reasons I wrote to Bell because there is no place I know of in the Nuclear Regulatory Commission where I can take the information to and have sense of confidence at all that anything is going to be done about it. And I've mentioned this to Mr. Bradford and I am here sitting waiting to know how I can work with this agency without going through headlines. Because it's particularly troublesome to me when people bring me information about safety hazards and then turn around and (not) use the documents for fear it will get back to them. I don't like sitting on those documents, but on the otherhand, I can't use them for two reasons: one, the guy who gave them to me may deny it, if it does get traced back to him and then I'll look like a fool, and of course nobody else is going to come forward after that either.

DONOVAN: Well, I guess in a similar sense I think that's part of the problem we sometimes run into.

POLLARD: I think you will because of the investigations that have already gone on in the past, people are not going to talk to you.

They don't trust the organization. I mean McTiernan.

DONOVAN:(inaudible)..concrete evidence to say that this was in fact the situation. It's very clever to get anybody to really state adequately this was the case; it's more by inference. I'm not a lawyer either so I don't know just how much of a ...hard evidence you really need to say that "this was or this wasn't".

POLLARD: Well, I don't know if you're looking for evidence to prosecute somebody. But the trouble is, this kind of evidence is enough to destroy public confidence in the regulatory agency.

DONOVAN: Yes.

POLLARD: And that's what's got to stop. The whole attitude there is "we know we are here to fight off any public that has any questions about nuclear power", and that is why this kind of memo has been written. If they would ever just adopt the attitude to do their regulation job and not worry if experts sometimes disagree on technical matters, I think that they would be quite surprised how smooth things would go along. It's some attitude held over from the past, I guess. Well I think that's really the fundamental problem--to have plants licensed that never should have been licensed and they are never going to admit that. And until they do, they have no power to force utilities to do the next plants better.

AUERBACH: I think you have indicated in this letter that the offsite power system is the preferable or sort of, if I might say, the first line of defense in the event the plant itself closed down.

POLLARD: Well, you mean, where I say that offsite electrical



power is the preferred source of energy?

AUERBACH: Right.

POLLARD: That comes from the documents themselves. 'I' triple 'E' Standard 308 calls it the preferred source of power and the other one is called the standby source of power. Now I think anybody will agree that, even in the common usage of the word, it is the preferred source, because its capacity is just huge compared to the diesel generators. When you are on the diesel generators, you are on a shoestring. You just run with bare minimum. And if you have offsite power you can do a lot of... take a lot of other actions that you are not able to take if you are on the diesels.

AUERBACH: If you know this, and I don't know that my question is going to be phrased properly, but in all the analyses and probabilistic analyses that are done, is it always assumed you will--- what is the assumption made concerning the availability of offsite power? (inaudible). I know you have two generators and I know you have battery rooms and things like that.

POLLARD: That's a point you can't get confused with. First let's start backwards. With respect to the batteries, don't count those as an independent source of power, because if you lose your batteries, you will have neither offsite power or the diesels. Because without the batteries, you can't control either source, therefore you don't have it. So it's not really a separate source. In the evaluation of the safety design, you make the assumption, first that you have no offsite power and see if the diesels can perform a safety function, and then you make the opposite assumption that the diesels are not



working and see if the offsite power system is enough. That comes from GDC 17 which requires this. In practice of course, what it turns out is loss of offsite power is the more severe case and so most of your evaluation is done, and it generally turns out if the diesels can handle it, there's no question that offsite power system is probably adequate.

With respect to a probability analysis, as to what are you likely to encounter, that's what Rasmussen tried to do with the Reactor Safety Study and he has in there figures for probability of loss of offsite power, probability of loss of diesels, and then the probability of restoring offsite power within X amount of time. And you'll see from his probability analyses, one of the contributors to the meltdown accident is total loss of electric power, both offsite and onsite. I don't know if that answered your question but.....

AUERBACH: I think it did..I was not interested so much in I guess the true probabilities of the accident occurring, as how the NRR Staff approached the safety evaluation.

POLLARD: The NRR Staff approaches the review, the safety evaluation, by assuming you don't have offsite power, and then you see if the diesels are adequate.

AUERBACH: Well, I know that from my experiences of being with inspectors at plants and talking with inspectors that, I guess, the plant itself when it is either brand new and starting up for the first time, or has gone down for refueling or gone down for some reason and starting back up needs the capacities to start itself up; it needs the capacity to draw offsite power.

POLLARD: Oh, that's true, but that's not a safety thing. It's



needed to start the plant back up, but it's not...I mean it's safe to stay shut down.

AUERBACH: Would that be the same amount of power, the same type of requirement that would be needed in the case of an accident?

POLLARD: Yes, I think the amount of power is roughly comparable. Generally you assume somewhere around five percent of the rated station output is needed for in-house loads. It's probably true that during startup those loads are somewhat, perhaps significantly, I don't really know, smaller during startup than they would be during normal operation, but I should also be able to say they are large compared to the power needs of a safety situation. Because you have huge pumps like the reactor cooling pumps, have to be running for startup and operation and they have no safety function. The same thing with the circ. water for the condenser. They are very huge motors that you don't need for startup and safety.

AUERBACH: Well, I guess, again to reiterate what Dick said, I guess the primary purpose of coming down was not to harass you or anything, but to get any other, I hate to use the word specific but any other information that might help us in tracking down and verifying or denying there was or wasn't a problem.

POLLARD: All I can say is that I don't know of any other specific problems on St. Lucie and I don't know of any other documents relating to the specific problem I did talk about other than the one I used plus all those that are in the testimony of the Government Operations Committee. My purpose in the letter was to tell to Bell I have lots of instances on other plants that I want to talk to the Justice Department about.

DONOVAN: Of the same nature you mean?



POLLARD: Yes.

DONOVAN: Of offsite power?

POLLARD: No. All across the spectrum.

AUERBACH: With regards to you seeing our writeup, what we'll do is, we'll write it up and we'll get in touch with you by telephone and we'll either send it down or bring it down and you are welcome to read it. If we've misunderstood you, just make corrections.

POLLARD: Sure. Fine.

AUERBACH: I have no problem with that at all. So we'll just get in touch with you by telephone and tell you when we finish writing it. (inaudible)...tomorrow or what not. We'll send you down a copy and you can perhaps....(inaudible)...send it back.

DONOVAN: Let me just make one more---Am I to understand that you say that when you were there as either a tech reviewer or a project manager that NRC at that time did make the---or at least, was required to make the analysis of the reliability of the offsite power?

POLLARD: Let me see if I can explain it again. The regulations have a requirement placed upon offsite power systems. All it says is that offsite power systems shall be designed so that upon loss of largest single generating station you don't result in loss of offsite power to the station. The regulations don't say anything about who is supposed to do that evaluation. It's just a requirement, just like it says you shall have two emergency core cooling systems to meet single failure. The point I was trying to make is that in the safety evaluation reports sent to boards or to the public, sometimes the Staff will say, "the applicant says....," and repeat back the words of the regulation, "that the system will remain stable and we find this acceptable." This is the Staff's statement. Sometimes they are honest and they don't try to pretend they have evaluated it. In fact I can't even



recall now what they specifically said about St. Lucie. All they said-- probably said--"we conclude that it meets General Design Criterion 17". They didn't say how did they make that conclusion, and the subsequent documents indicate to me, they didn't have a basis for making that conclusion and in fact they had information to the contrary. The regulations themselves don't say who's supposed to do the evaluation, but the whole licensing process, in general, amounts to the licensee making sure the plants are safe, or the applicant, and the staff spot-checking. The Commissioners have said this before Congress several times. It's generally an audit process. The other point I was trying to make was if somebody by magic ordered the Staff to confirm the adequacy of the offsite power system, they'd be hard pressed to do it, because I don't know if they have anybody qualified to do it or very few people. Which is probably why they put this contract out to Oak Ridge and whether or not Oak Ridge has somebody assigned to it that's qualified, I have no idea. I also know they already have fallen behind schedule in their--the other document I didn't mention which you can look at is, what are they planning to do now to resolve this problem-- they call it--of these Generic Problems it's number A-35 and they have a Task Action Plan dated October 12, and here again the Task Manager is Don McDonald--Dan McDonald. And, if you read through here, what needs to be done now, I think it's quite clear that in the past they had no basis for ever saying that they had evaluated the offsite power system. And there is nothing in here that says they are going to rely on the Federal Power Commission to do this. The whole tone is that it's the Staff's responsibility to be able to confirm the licensee's statements.



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DONOVAN: I might make a statement about the Federal Power Commission. It is my understanding or at least one of the explanations that we received as to

POLLARD: My experience is that whenever something goes public and they're being questioned, they can invent all kinds of rationalizations as to why things were done a certain way in the past, but it doesn't conform to my experience, as to what was suppose to have been done.

DONOVAN: (inaudible)..hopefully to gather information as to what actually was required back in 1971 through '74 period.

POLLARD: Well, '71 is easy because it's still the same regulation.

DONOVAN: The Standard Review Plan...I'm not sure if that includes...(inaudible)

POLLARD: No, but what the Staff has said, which I don't think is completely honest, is that the Staff...is that the Standard Review Plan was to assist licensees in understanding how did the Staff evaluate their application and that this was the process that had been going on for a long time; it was only then documented in the Standard Review Plan. I know this is not--this type of implications are not true. When we first started writing the Standard Review Plan, we were instructed to write down how it was we in fact did our reviews. When they got themselves in trouble before the Joint Committee, when they started being questioned about, well, "how do you have any control over the review and how do you know how anybody does it?" "Oh, well we are writing a Standard Review Plan." Well right after that time, then the task got changed into, "write the Standard Review Plan to specify how you should review the plants." And I really wish I had saved some of the early drafts. You could



see the difference between when we were told to write how we did the review versus how we should do the review.

There was quite a stark difference. Because it said right in the Standard Review Plan originally, "Well, we just accept whatever the applicant says,"---when offsite power systems fail.....because that was what was going on. But that was originally not intended to be a public document. Probably the idea was to have some of the management try and get some hold at to what in the devil was going on inside the agency. The whole thing changed of course once the ...Joint Committee... ..(inaudible)..

DONOVAN: Hopefully,..some of the other people from NRR.:

..(inaudible)

POLLARD: When you do your investigations: in the house, you generally don't...you don't take depositions like the FBI might do or something, do you?

DONOVAN: I'm not sure at this stage what our approach will be. We're just gathering information to find out how many facts there are, until we find out how much information is available and then....

POLLARD: Because the thing which keeps coming to me from various people in the agency is the statements that," if I would ever have this under oath, because I'm not going to lie, I'd have to tell the truth then and I'd be willing to do it." But if they don't have that protection, and I call it protection myself, just as when I was testifying under oath in hearings, you are allowed to say things that you really believe, that if you just said normally might subject you for a court suit for libel or something, and that's when I said to the



North Anna Board that really you ought to make everybody testify under oath because then not only are they...you have enforcement against them later. but also offers the person making the statement some protection against them going back to reprisals later.

DONOVAN: So you feel it would be better to have a.....

POLLARD: Yes, plus I don't of course-well I don't know, I don't have any investigative training, but I have the feeling that when you go around with this so-called background information, it gives everybody the chance to make sure that their final story all fits together and is consistent, instead of getting one guy in a room unannounced and say, "alright, here's what we are going to ask you, these questions, what is your answer?" and do the same thing with another guy without letting them talk in the first place. It's the only way you are going to pick up these contradictions because the agency is out to defend itself, no question about it. The people who you are talking to, although they might want to tell you the truth, they don't have any protection against reprisals later, from the same management officials who weren't listening to their complaints in first place. You have a very tough job. That's why I don't believe the way the internal shop is now set up is ever going to work.

DONOVAN: Hopefully we can be of some assistance. I don't know.

POLLARD: Oh, I'm sure. You can give it a try. It's good the Commission said it's going to be public.

DONOVAN: Well listen, thanks. We sure appreciate your taking the time.

(Meeting ended.)

(Discussion about the weather and questions about frequency of traveling to Cambridge were not transcribed.)



MEMORANDUM OF INTERVIEW

DATE: 1/12/78

PLACE: UNION OF CONCERNED SCIENTISTS
1025 15th Street, N.W., Washington, D. C.

TIME: 10:00 a.m.

PARTICIPANTS: Robert Pollard - UCS
Richard Donovan - OIA
Michael Auerbach - OIA

SUBJECT: ST. LUCIE 1 INVESTIGATION



On January 12, 1978, Robert Pollard was interviewed by Richard Donovan and Michael Auerbach regarding his allegations concerning grid instability in the Florida Power and Light (FP&L) Grid System. Mr. Pollard requested that he be allowed to tape our interview and that he be able to see a copy of our interview write-up. Both requests were granted. After we identified ourselves as OIA employees, we informed Mr. Pollard that the purpose of our interview was to obtain any additional information which would help expand or clarify his allegation(s) concerning St. Lucie 1.

Mr. Pollard commented that he did not do any work on St. Lucie and had no personal or additional knowledge of events relating to the St. Lucie plant, other than the copy of the August 14, 1974, memorandum submitted with his letter to the Attorney General. He mentioned, however, that if we reviewed transcripts of the testimony given before the Senate Operations Committee (Fall 1976), we would find references to several documents relating to grid stability. Mr. Pollard indicated that during his tenure with the AEC/NRC no analytical work on grid analysis was done, because no one knew what to do with the information. He indicated that no one in the NRC was qualified to look at Offsite Power Systems with respect to meeting the criteria in General Design Criteria (GDC) 17.

Mr. Pollard stated that both the Regulations and GDC 17 have requirements that the power grid withstand the loss of the largest single generating unit on the grid system. He indicated, however, that the requirements themselves do not address who is responsible for making the grid stability evaluation. Mr. Pollard also commented that the FSARs often simply state that the offsite power will remain stable and offer little or no substantiation for concluding this. He said the SERs usually restate the conclusion of the FSAR and only sometimes infer that the staff made some type of an analyses or evaluation.

*Received from R. Donovan
on February 1, 1978.
R. Pollard
2/1/78*



ELBERT P. EPLER
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RECEIVED

Enclosure 4



Aug 30 1977

77 SEP 1 Pm

U.S. NUCLEAR REGULATORY COMMISSION
ADVISORY BOARD ON REACTOR SAFETY GUARDS

Wm Keyr

Chairman Electrical Systems, e&I Subcommittee.

Four recent events have revived interest in a problem of long standing.

1. Arkansas Power and Light is appealing the NRC staff Position 20 concerning the data link between the Core Protection Calculator and the plant computer. It is the staff position that the data link compromise the independence of the protection system.
2. In a recent letter I pointed out that the failure of a d.c. bus would cause impairment of residual heat removal systems and at the same time cause a scram which in turn, would cause d.c. to be needed for residual heat removal.
3. In a recent event at Three Mile Island, four neutron flux power level channels were miscalibrated by 8 to 10% for an unspecified length of time as a result of the failure of a single instrument that provided data for the thermal power computer calculation.



4. At Zion in a recent event, dummy signals inserted into the system for test, disabled the shared sensors for protection and control. As a result the vessel water level was lowered by the control, while at the same time the protection against the event was disabled.

Each of these comes under the heading of Separation of Protection and Control, which is poorly understood and in need of attention.

The principle of Separation of Protection and control was established many years ago during the design of the MTR, which was the forerunner of all LWRs. For that reactor a high performance power level controller was applied which was capable of very fast response. A failure of the controller could put the reactor on a severe power excursion and for that reason a high performance protection system was applied. As a minimum the protection system would be required to protect against any event which might be caused by failure of the control. It was perfectly obvious that the systems must be completely separate and independent. Failure of both as the result of a single event would be intolerable.



The principle of separation was clearly logical and sound and continued to be applied to ORNL systems. About 1950 another important reason for separation made an appearance.

An in-pile experiment was presented for review which proposed to use a single instrument both for data collection and for protection of the experiment and the reactor. A high degree of accuracy was desired for the data collection which would require frequent calibration of the instrument. During calibration it would be disconnected from the protective feature in order not to scram the reactor. To calibrate the recorder door would be opened which operation would disconnect the scram feature and at the same time start a timer. The operator would as a result be allowed a limited amount of time for calibration with the experiment and the reactor unprotected. Closing the door would restore the protection.

It was immediately clear that in using the same instrument, or set of instruments, for both functions. The protection would be degraded to obtain accuracy for the experiment, which was totally unnecessary for protection. We should be grateful to the experimenter for recognizing the significance of this and leveling with us.



In 1958 an event at HTRE 3 further confirmed the importance of separation. A set of three ionization chambers served both the protection and control systems. At some time R.C. noise filters were inserted in the chamber power supply circuits which inadvertently limited the available current to an amount insufficient to produce a scram. It is not known whether this filter was intended to improve the performance of the protection or of the control. In either case the filter limited the current thereby causing the controller to see a low power level and dutifully withdraw rods to increase the power. At the same time the protection also saw the low power level and did nothing. As a result core melting occurred.

The above illustrates the need for separation to prevent a common mode failure from causing both protection and control to fail. Above all the common mode failure must not result from improvements made to the control system which would cause failure to protect.

The Standard IEEE 279 addresses the problem but fails in an important respect. The same devices may be used for both protection and control providing "the remaining redundant protection channels shall be capable

of providing the protective action even when degraded by a second random failure." This position was adopted to accommodate industry practice where the same devices in two of four logic, were invariably used for both protection and control. As a result protection is provided against random failure, which has never been a problem, and no protection is provided against common mode failure which is the real problem.

The CRBR took refuge behind the shelter of IEEE 279 in spite of the prohibition contained in RDD standard C16-1. In the primary protection system the same ionization chambers were used for both protection and control. The "diverse" secondary system also measured neutron flux by means of fission counters. For each channel both the chambers and counters were mounted behind a single moderator block which could become contaminated and at the same time cause the failure of the control system and both protection systems. Neither system contained a truly diverse thermal power measurement to protect against this event.

The Westinghouse product line routinely uses the same instruments for both protection and control. This practice was challenged in 1967, but because of the large amount of diversity in these systems no case could be made for

correction. The following however is contained in my
Jan 24, 1969 letter to the ACRS.

"The use of the same or identical but separate equipment for protection and control tends to degrade the protection function and at the same time prevents the use of diversity in control and protection. The use of separate and diverse systems is clearly needed to obtain the required performance.

.... It is the current practice in PWRs to cut off system letdown flow on occurrence of low pressurizer level. Thus a spurious indication of low pressurizer level will be the cause of overpressurizing the system. In this kind of situation where information is contradictory, correct operator response cannot be counted on.

It is concluded on the basis of the assumed tolerable frequency of uncontained excursions and the estimated excursion rates, that existing techniques are adequate to produce protection features satisfactory for the infrequent primary rupture, that dual and diverse reactor protection systems will be required, and since all protective features are at best, marginal in failure probability, interactions between protection and control must be minimized."

Although the "spurious indication of low pressurizer level will be the cause of overpressurizing the system" was seen as a possible result of using the same devices for protection and control, it was not foreseen that a similar condition could be brought about by the use of dummy signals, as was the case at Zion.

Largely as a result of the weak requirements of IEEE 279, the principle of separation has now degenerated to no more than the use of light pipes as evidence of concern. Modern solid state devices are susceptible to stray voltages and precautions are taken to transmit all signals between protection and control through light pipes. In older systems the conventional relays and switches were adequate as isolating devices. No failure is known ever to have occurred because of this problem although it is now receiving attention to the exclusion of the real problems.

In the matter of the data link between the CPES and the plant computer, I had not taken a position in opposition. It is indeed true that signals taken from the protection system to the plant computer can be quite useful in enhancing safety. There is of course the concern that the safety function could be degraded as the result of changes to hardware, or software intended to improve the quality

of the data transmitted to the plant computer. It would seem reasonable that suitable precautions could be taken to prevent this and that the advantages might outweigh the disadvantages.

Recent events however have convinced me that we are virtually without protection against the ill effects of interconnecting the CPCs and the plant computer. The true nature of the problem is so little understood that we can not be assured of an adequate defense. We are at the mercy of a few highly specialized computer technicians for assurances that harmful interactions will not result; we have no assurance that they are acquainted with the true nature of the problem. This is borne out by the following taken from the attachment to the letter J. D. Phillips to R Boyd, 7/29/77.

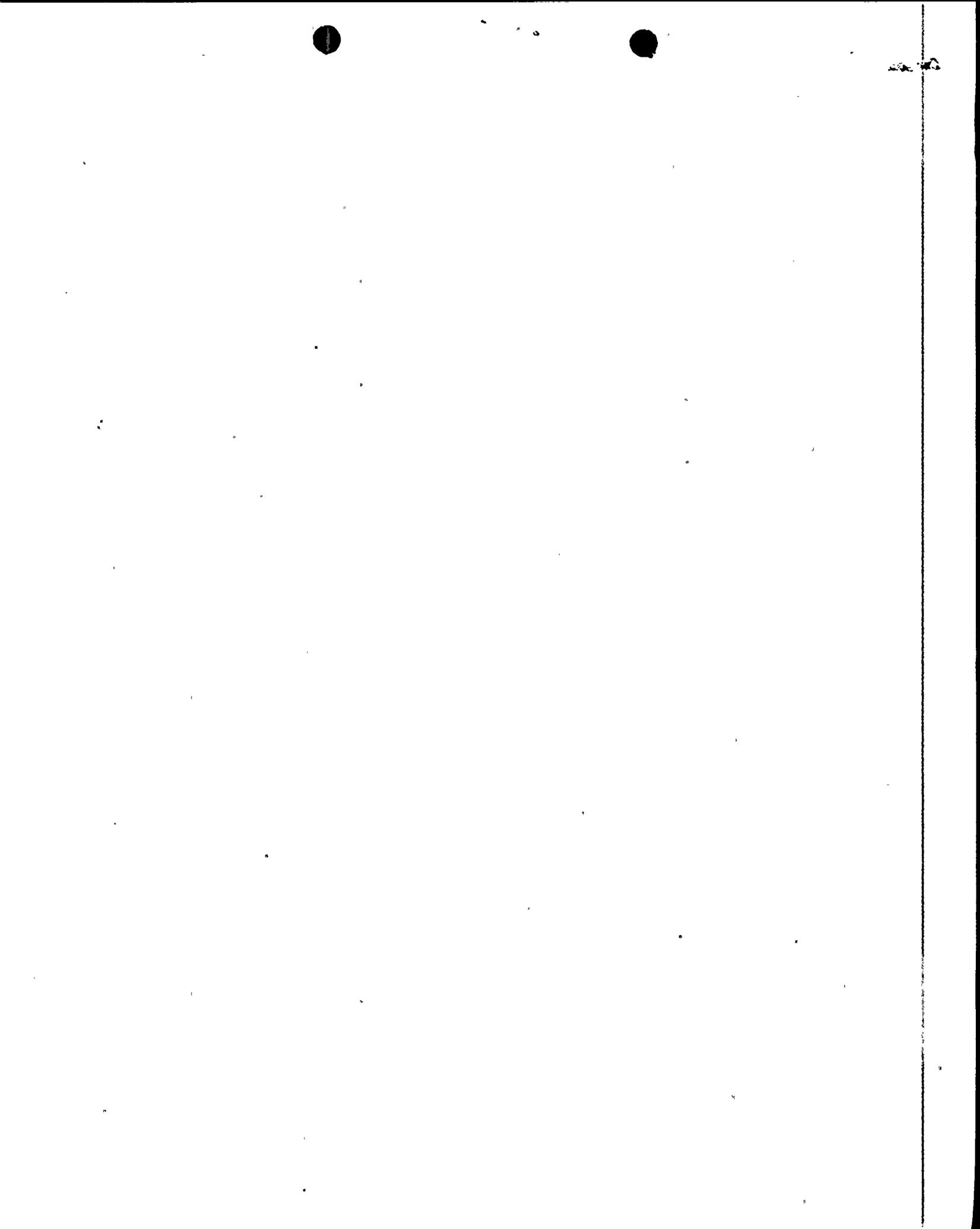
"The data links between the DMBR/LPD calculator system and the plant computer satisfy the requirements of GDC 24 and IEEE 279-1971, section 4.7, regarding independence of protection systems. IEEE 279 requires that the transmission of signals from the protection system be through isolation devices. Optical isolators at both sending and receiving ends of the plant computer data links meet this requirement. These optical isolators ensure that no credible event at the plant computer can degrade

the protection system. GDC 24 requires separation of protection and control systems to the extent that failure or removal of common equipment leaves intact sufficient equipment to meet all protection system requirements.

This paragraph provides ample evidence that no effort is contemplated to ensure against more subtle interactions such as harmful alterations to the CPCs hardware, which might be made in order to enhance the quality of data transmitted to the plant computer.

Other vendors will shortly be proposing similar systems having similar problems. I propose that the applicant be required to provide evidence that precautions beyond the requirements of IEEE 279 and GDC 24 have been given consideration.

R P Egan



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

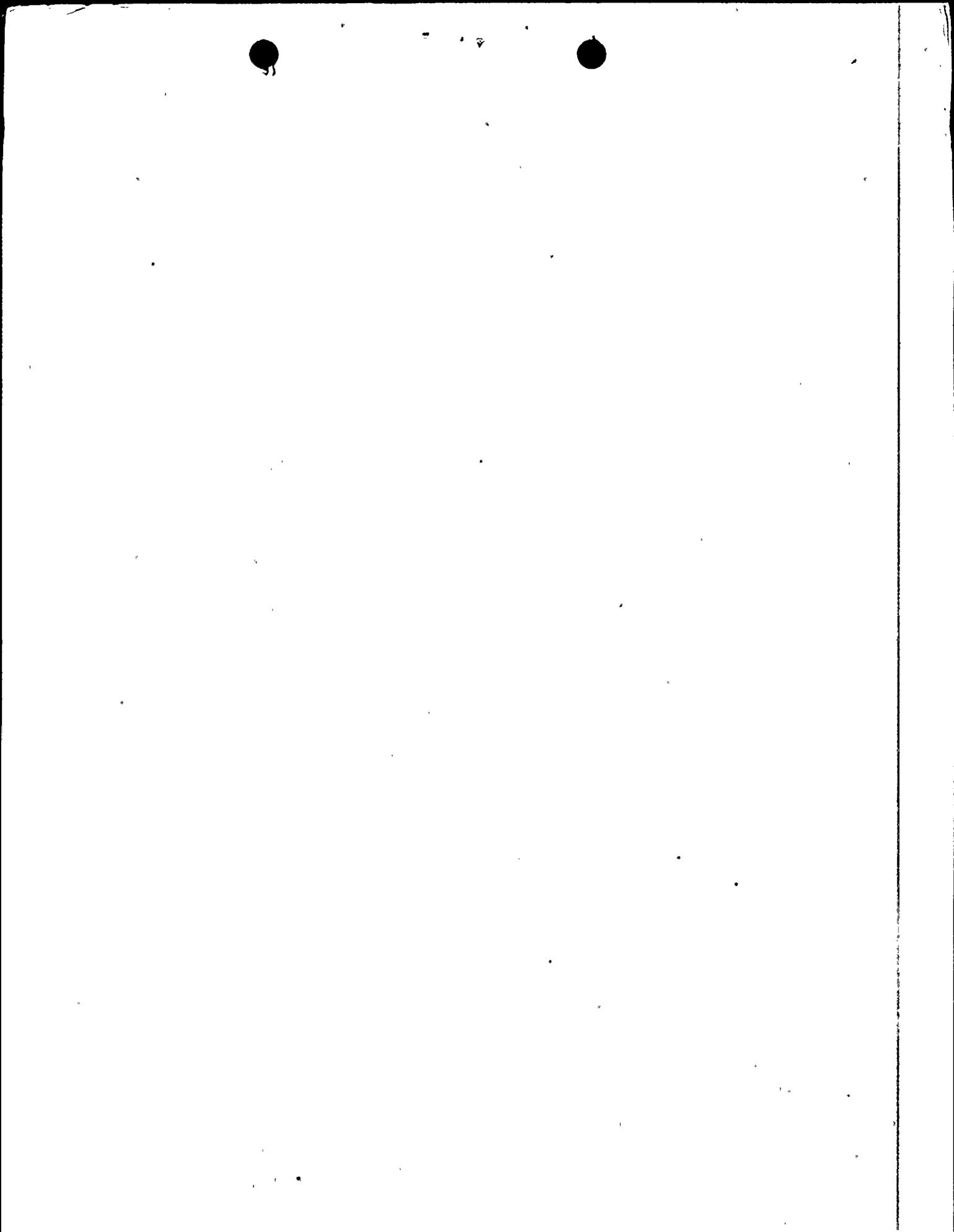
In the Matter of)
)
FLORIDA POWER AND LIGHT COMPANY) Docket No.(s) 50-389
)
(St. Lucie Plant, Unit No. 2))
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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document (s) upon each person designated on the official service list compiled by the Office of the Secretary of the Commission in this proceeding in accordance with the requirements of Section 2.712 of 10 CFR Part 2 - Rules of Practice, of the Nuclear Regulatory Commission's Rules and Regulations.

Dated at Washington, D. C. this
11th day of March 1978.

Deary T. Downing
Office of the Secretary of the Commission



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)

FLORIDA POWER AND LIGHT COMPANY)

(St. Lucie Plant, Unit No. 2))
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Docket No. (s) 50-389

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