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**Congress of the United States**  
**House of Representatives**  
**Washington, DC 20515**

April 9, 1987

The Honorable Lando Zech, Jr.  
Chairman  
Nuclear Regulatory Commission  
1717 H Street, N. W.  
Washington, D. C. 20555

TO: JIM PENNY  
FM: OCA  
11 PAGES

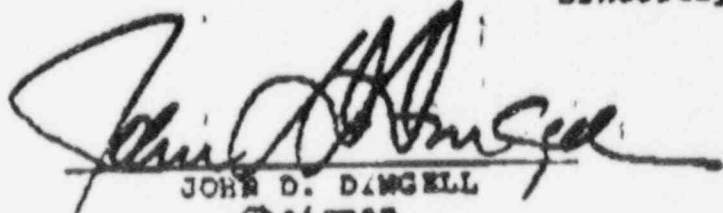
Dear Chairman Zech:

We have received the enclosed letter from Mr. Dallas Hicks, an engineer who once worked in the Tennessee Valley Authority (TVA) nuclear power program. As the materials submitted by Mr. Hicks make clear, he has, since leaving his TVA position, maintained a deep interest in the safety of TVA's nuclear plants.

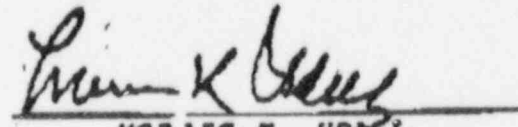
The 28 items presented by Mr. Hicks in the first attachment to his letter have potentially significant implications with respect to whether the Sequoyah reactors comply with the Commission's regulations. Accordingly, in order for there to be public confidence in any Commission decision to allow restart of the Sequoyah reactors, it is important that the Commission state its position with respect to the validity of Mr. Hicks' 28 items. In addition, please provide the Commission's position with respect to which of these items need be resolved prior to restart at Sequoyah, which need be resolved after restart, and the rationale for placing the items in the pre- or post-restart category.

Thank you for your attention to this matter.

Sincerely,



JOHN D. DINGELL  
Chairman  
Committee on  
Energy and Commerce



MORRIS K. UDALL  
Chairman  
Committee on  
Interior and Insular Affairs

Enclosure

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Axelrad

6621 Woodrose Lane  
Knoxville, TN 37912  
March 28, 1987

Hon. John D. Dingell, Chairman  
Subcommittee on Oversight and Investigations  
United States House of Representatives  
Room 2323  
Rayburn HOB  
Washington, D. C. 20515

Hon. Morris K. Udall, Chairman  
Committee on Interior and Insular Affairs  
United States House of Representatives  
1327 Longworth Building  
Washington, D. C. 20515

Gentlemen:

Subject: TVA-SEQUOYAH NUCLEAR PLANT PROBLEMS

Reference: Letter From D. Hicks to Representatives  
J. Dingell and M. Udall and the Nuclear  
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TVA Nuclear Program," dated November 27, 1985.

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TVA-Sequoyah Nuclear Plant problem resolutions and lack  
thereof and the attempt by TVA to restart Sequoyah without  
having done an adequate and thorough job in evaluating and  
fixing problems. The vast majority of these concerns were  
initially highlighted in the Reference and subsequently  
discussed with NRC personnel on February 21, 1986.

At the request of the staff of The Subcommittee on  
Oversight and Investigations, and pursuant to a forthcoming  
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of Special Projects, and Mr. Ben Hayes, Director of The NRC  
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the major items that are being inadequately addressed or  
ignored or misrepresented by TVA at Sequoyah. I am  
enclosing a summary of items discussed in that meeting on  
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problems with current and past TVA plans.

There is a strong need for TVA to truly establish  
Sequoyah's baseline configuration to an acceptable  
configuration that meets NRC Regulations (not TVA's limited  
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Enclosure) in order to assure adequate health and safety for

P4 AxelRAD

the Tennessee Valley residents. As included in the Enclosure, the documents indicate that a case can be made that TVA's original design, construction, testing, and inspection were grossly different from commitments in the FSAR and from acceptable national standards and practices, and the current TVA plans are inadequate to resolve these problems. TVA simply did not implement its commitments to the NRC, thus voiding the very bases for TVA's operating license for Sequoyah.

There is a large gap existing between how TVA built Sequoyah and how TVA committed in the FSAR to build it. A partial fixing (largely based on unacceptable and narrowly scoped sampling techniques with no analytical and/or logical bases) of only changes made to the plant configuration, since the original license, will not bridge this serious gap in work left undone and in problems not being assessed and fixed.

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In summary, the NRC should require TVA to perform a complete (100 percent) verification program and go through the licensing review process again, covering each system in depth, in order to again obtain an operating license for Sequoyah. Additionally, a complete preoperational testing program should be required to shake down the plant systems at Sequoyah because they will have been idle for a long period since they were last operated.

Sincerely,

*Dallas R. Hicks*  
Dallas R. Hicks

Enclosure: TVA-SEQUOYAH PROBLEMS

cc: Mr. James Keppler, Director  
NRC Office of Special Projects

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Axelrad

Enclosure

SUMMARY OF ITEMS DISCUSSED WITH MR. JAMES KEPPLER  
DURING MEETING ON MARCH 23, 1987

TVA-SEQUOYAH NUCLEAR PLANT PROBLEMS

1. INITIAL LICENSING BASES VOID

Sequoyah Nuclear Plant was licensed on the basis that TVA had adequate design and construction practices and that TVA followed NRC requirements. However, it has been found that these assumptions were incorrect, and there are documented findings adverse to these assumptions. TVA misrepresented the quality of its work and has in general not followed requirements for the bases of the initial license. Therefore, the original bases for a license at Sequoyah can be considered void. TVA should not be permitted to continue on the basis of its ongoing "band-aid" approach at sampling and fixing portions of the plant. TVA should be required to go through a thorough licensing review for Sequoyah similar to a new plant in order that the Tennessee Valley residents can be assured that every safety function of the plant will operate and that TVA has not just sampled areas where TVA personnel decided necessary.

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In particular, there is a massive difference between the FSAR and the actual construction configuration. Much of the original design bases had no analytical or logical bases. This further justifies the need for re-licensing efforts.

3. PROBLEM FIXES AT SEQUOYAH POST-RESTART VERSUS PRE-RESTART

There are too many things in all areas that TVA is planning and promising to do after restart. Many of these must be fixed before restart due to their serious impacts. TVA has had a long history of promising the NRC that TVA will do something in the future and TVA has not kept its promises. With these endless unfulfilled promises by TVA, the NRC must not grant permission to restart prior to the fixes.

Refer to Enclosed Item 22, Memo from R. W. Cantrell to Those listed, "SEQUOYAH NUCLEAR PLANT - RESTART REQUIREMENT CRITERIA," dated December 23, 1986.

4. WATTS BAR PROBLEM GENERIC APPLICABILITY TO SEQUOYAH

There must be an understanding of each Watts Bar Nuclear Plant concern and an adequate assessment of its applicability to Sequoyah Nuclear Plant prior to restart. TVA personnel claim that they are concentrating on fixing Sequoyah and will do Watts Bar later. They have bid requests issued to potential contractors for the Watts Bar Recovery Program, to supply personnel (between 900 and 1000) for two and a half years. Until TVA adequately assesses, understands, and addresses the problems at Watts Bar, they are incapable of totally understanding the generic implications of the same kinds of problems at Sequoyah.

5. APPENDIX B

TVA has had and still has a generic problem with its implementation of an acceptable Appendix B Program. Until this issue is resolved, TVA cannot be permitted to operate any plants, including Sequoyah.

6. QUALITY ASSURANCE

A recent TVA Audit Deviation QWB-A-87-0004-D02, reflects much of the same QA attitude as has existed in the past at TVA.

Refer to Enclosed Item 6, "UPGRADING AUDIT DEVIATION QWB-A-87-004-D02 TO TYPE I," and "COMMENTS" on subject document.

7. CALCULATIONS

TVA has only scratched the surface in assuring that calculations are adequate in all disciplines. An acceptable calculational basis for items in all disciplines must be in place prior to restart.

Refer to Enclosed Item 8, Memo from W. S. Raughley to Those listed, "POLICY MEMORANDUM PM86-02R1 (EEB) - REVISION 1 - ELECTRICAL CALCULATIONS," dated February 4, 1987.

Refer to Enclosed Item 9, Memo from C. A. Chandley to Those listed, "POLICY MEMORANDUM (MEB) - MECHANICAL CALCULATIONS - MPM86-04," dated JUNE 25, 1986; Memo from C. A. Chandley to Those listed, "SEQUOYAH NUCLEAR PLANT - REVIEW OF ESSENTIAL MECHANICAL CALCULATIONS FOR TECHNICAL ADEQUACY," dated December 17, 1986; Memo from J. C. Key to C. A. Chandley, "SEQUOYAH NUCLEAR PLANT (SQN) - DESIGN CALCULATION REVIEW," dated October 7, 1986; and individual TVA responses to C. A. Chandley concerning the mechanical calculations.

## 8. ELECTRICAL CALCULATIONS

Many of the electrical calculations are committed by TVA to be completed after restart, but this should not be permitted. Many assumptions were made relative to the fact that Sargent and Lundy were told by TVA that certain calculations were not done because the information was contained in design standards or guides. However, since TVA personnel have had such a blatant attitude about downgrading standards, abusing the intent of such documents, and not following them, the design standards and guides could not be relied on to substitute for calculations in many areas. Further, the results of calculations have not been effectively integrated into design and construction documents and criteria. The subject of ineffective integration of and misuse of calculations has not been evaluated for the degree of problem areas that exist and the magnitude of upgrading required. This should be completed and all fixes made prior to restart.

Refer to Enclosed Item 3, Memo from W. S. Raughley to Those listed, "POLICY MEMORANDUM PM86-02R1" (EES)  
- REVISION 1 - ELECTRICAL CALCULATIONS, dated -  
February 4, 1987.

## 9. MECHANICAL CALCULATIONS

TVA is not taking responsibility for vendor calculations and is not independently reviewing and verifying them. The reviews by mechanical personnel are only paper reviews, not technical reviews and are not independent reviews for adequacy in order to scope the problems and to identify the fixes. An independent review, similar to that done by Sargent and Lundy for electrical calculations, should be done for the mechanical calculations. Many of these calculations are missing and many are committed to be done after restart. All should be independently reviewed for adequacy and fixed or done initially (since it appears that many were never done or done properly and recorded) prior to restart. Since TVA personnel have had such a blatant attitude about downgrading standards, abusing their intent, and not following them, the design standards and guides could not be relied on to substitute for calculations where such is being done. Further, the results of calculations have not been effectively integrated into design and construction documents and criteria. The subject of ineffective integration of and misuse of calculations has not been evaluated for the degree of problem areas that exist and the magnitude of upgrading required. This work should be completed and all fixes made prior to restart.

There is no evidence of TVA's assessing and including mechanical calculations, for non-safety-related systems that could impact safety systems and/or important to safety items that could impact safety systems and/or plant reliability, in their plans for either before or after restart. Calculations for control room filtering (KEPA or other) were not found to be included in TVA's list of calculations.

Refer to Enclosed Item 9, Memo from C. A. Chandley to Those listed, "POLICY MEMORANDUM (MEB) - MECHANICAL CALCULATIONS - MPM86-04," dated JUNE 25, 1986; Memo from C. A. Chandley to Those listed, "SEQUOYAH NUCLEAR PLANT - REVIEW OF ESSENTIAL MECHANICAL CALCULATIONS FOR TECHNICAL ADEQUACY," dated December 17, 1986; Memo from J. C. Key to C. A. Chandley, "SEQUOYAH NUCLEAR PLANT (SQN) - DESIGN CALCULATION REVIEW," dated October 7, 1986; and individual TVA responses to C. A. Chandley concerning the mechanical calculations.

#### 10. ELECTRICAL AND MECHANICAL LOAD CALCULATIONS

TVA's current and past actions have not effectively addressed and solved these serious problems. Solutions and fixes are required prior to restart. TVA has not adequately established the calculated and actual bases for each load and has not established a system with traceability of requirements.

Refer to D. Hicks' letter to NRC on Concerns Regarding The TVA Nuclear Program, dated November 27, 1985, and above calculations.

#### 11. MARGINS IN CAPACITY FOR DIESEL GENERATORS AND BATTERY SYSTEMS

TVA's current and past actions have not effectively addressed and solved these serious problems. TVA must complete Items 8, 9, and 10 above and integrate actual data from vendor information and from vendor and TVA testing to establish a controlled and traceable load list, clearly identifying margins that exist. Until this is done and TVA corrects deficiencies in these areas and justifies to the NRC that adequate capacity margins do exist in the diesel generators and battery systems, TVA must not be permitted to operate Sequoyah.

Refer to D. Hicks' letter to NRC on Concerns Regarding The TVA Nuclear Program, dated November 27, 1985, and above calculations.

Refer to Enclosed Item 11, "Reportable Event Number 05098," concerning inadequate diesel generator capacity for Sequoyah due to "DESIGN DEFICIENCY," dated June 17, 1986.

12. DESIGN BASELINE AND VERIFICATION PROGRAM

This program only assesses the adequacy of past modification work. One cannot establish the plant configuration, as claimed by TVA, by only assessing modifications and by ignoring the unknown and original base configuration and its problems.

Refer to Enclosed Item 12. Excerpt from "TVA's Nuclear Performance Plan, Vol. II, Section III."

This program does not assess the technical adequacy of the plant systems, but is depending on the calculation reviews for assurance of adequacy. This is a gross fallacy since those reviews are in many areas only a review of paper, not reviews of the technical content of the calculations (example: mechanical calculations).

13. DESIGN CRITERIA

TVA has been in a mode of evaluating against lesser criteria than standard acceptable criteria and lesser than some of their original criteria. Has the NRC approved less stringent requirements? If so, why?

14. INDEPENDENT NUCLEAR SAFETY REVIEW

TVA claims that the current Nuclear Safety Review Board (NSRB) replaces the functions of the abolished Nuclear Safety Review Staff and that the NSRB chairman has excellent credentials. Enclosed is a news article quoting his philosophy and feelings, as follows:

- TVA's nuclear plants "are really very nice plants."
- "As a matter of fact, Sequoyah probably is cursed by being too nice a plant. It is so well built that people have tended to become a little complacent, that this is such a nice plant that it is not going to get into any trouble."
- Watts Bar Nuclear Plant, southwest of Knoxville, does have "specific, isolated" problems in some areas such as welding, he said. "Some of those need to be fixed. Watts Bar is an extremely stout plant, very well designed and in virtually every instance, very well built. From a simple, direct safety point of view, I wouldn't have any particular qualms about starting that plant up today and running it," he said.

CONCLUSION ON THIS ATTITUDE: How can the current chairman of the NSRB, W. Hannum, with the above attitude, be of use to TVA? How could he give the citizens of the Valley any good feeling that problems



would be viewed realistically and fixed? Is he totally out of touch with reality when there is overwhelming evidence in the hands of investigators and the NRC to refute his beliefs? The problems associated with these plants are widespread.

Refer to Enclosed Item 14, The Knoxville News-Sentinel article, by Laura Simmons, dated March 9, 1987.

15. VOLTAGE PROBLEMS

TVA has not adequately handled impacts of voltage degradation on utilization buses and the problems caused by unacceptable fixes.

Refer to D. Hicks' letter to NRC on Concerns Regarding The TVA Nuclear Program, dated November 27, 1985, and above calculations.

Refer to Enclosed Item 15, NRC Branch Technical Position PSB-1 and TVA NCR BLNEEB0505.

16. CABLING PROBLEMS

All cable calculations and installations need to be verified to be acceptable in areas such as ampacity, insulation types, raceway fills, derating, sidewall pressures, etc. Sampling should not be permitted. Every single cable should be verified and done prior to restart. TVA has only scratched the surface in assessing and fixing these problems and it appears that TVA learned very little from the Browns Ferry fire.

17. TVA'S SAMPLING PHILOSOPHY IS TOTALLY UNACCEPTABLE

For any given type of task, more than one group of people may have done the work in different areas of the plant. Some crews were better than others. A sampling in an area of the plant may cover only one crew's work and not the other crews' work. This and other reasons (such as varying degrees of QA/QC inspection competency, TVA's widespread harassment and intimidation and firing of QA/QC personnel, and the fact that TVA has claimed to be using statistical sampling but has neither substantiated the bases of statistical sampling nor have they used statistical analysts trained in these areas) are sufficient enough to disallow sampling of any item for fixes. Sample looking and sample fixing are not acceptable to assure the public that a plant is safe.

18. INTERFACE CONTROL

TVA has had shoddy and informal control of interfaces between plant systems and the current program has not

effectively addressed this problem and has not fixed the problems that have resulted from this lack of control for many years. This work must be done prior to restart.

19. ENVIRONMENTAL QUALIFICATION

TVA has not and cannot do justice to fixing all problems that exist in this area at Sequoyah. Every single safety-related item must be verified that it is adequately qualified and TVA must not just do a sampling. This must be done prior to restart. Much of TVA's efforts have been spent in fixing paper and not in fixing hardware. Why is TVA not being required to test the majority of items that have not been qualified? The limited testing that has been done only scratches the surface of the total scope of problems.

20. PHYSICAL AND ELECTRICAL SEPARATION OF REDUNDANT SYSTEMS AND COMPONENTS

Every system must be evaluated and fixed to an acceptable level regardless of any "grandfathering" allowed at the time of the original license since TVA's gross negligence and misrepresentation should have voided any "grandfathering" and paved the way for a total realistic look at what is acceptable.

21. TREATMENT OF FIRE ZONES AND FIRE PROTECTION

In conjunction with separation, fire zones and fire protection should be reviewed totally for Sequoyah for an acceptable implementation of today's requirements. This should be completed prior to restart. "Grandfathering" should be avoided to maximum extent possible.

22. TVA'S DEFINITION OF REGULATION

TVA's definition and manipulation of the definition of the word, "regulation," to satisfy its needs and to justify allowing many resolutions to serious problems after restart are unacceptable and should be rejected by the NRC.

TVA personnel continue to claim that they do not have to follow design criteria, Regulatory Guides, TVA Engineering Guides and Standards, national codes and standards, and the FSAR, even though TVA committed to do so and did not seek nor get approval of alternatives. This attitude has been a major contributor to TVA's problems for many years and it can be seen clearly to exist currently. Until this attitude and mode of operation is gone from TVA, TVA can never be expected to correct its massive problems. TVA should never be

allowed to operate any nuclear units until this philosophy is changed.

Refer to Enclosed Item 22, Memo from R. W. Cantrell (attachment principally prepared by T. A. Ippolitto), "SEQUOYAH NUCLEAR PLANT - RESTART REQUIREMENT CRITERIA," dated December 23, 1986.

Refer to Enclosed Item 22, Memo from M. R. Harding to L. M. Nobles and D. W. Wilson, "SEQUOYAH NUCLEAR PLANT - 10 CFR 50.59 EVALUATIONS," dated January 28, 1987.

Refer to Enclosed Item 22, TVA'S "GUIDELINES FOR POTENTIAL OPERABILITY DETERMINATIONS."

23. LACK OF ACCEPTANCE CRITERIA FOR INSTALLATION AND TESTING OF EQUIPMENT AND OTHER ITEMS

Has TVA assured that each test was done properly or redone to acceptable criteria? Are there test records substantiating such? This verification must be done prior to restart and no sampling should be permitted.

24. SEISMIC CALCULATIONS

Seismic hold-down forces for equipment and other items are not addressed in any detail in electrical and mechanical calculations.

There is a major question as to whether these have been verified and calculated and/or recalculated to acceptable criteria. 100 percent verification must be done prior to restart.

25. AS-CONSTRUCTED DOCUMENTATION

There is conflicting information given in presentations and in written material as to TVA's intent on as-constructed versus as-engineered drawings. This documentation should be completed prior to any restart and the control room/shift engineer/operators must have documentation that is per the construction configuration and per the available drawings stored in all plant and central office files.

TVA has failed to independently review and adequately challenge vendor calculations and design drawings and documents. TVA has failed to take responsibility for vendor work. TVA must take this major responsibility regardless of whether TVA or a contractor does work.

26. INVENTORY CONTROL AND IMPROPER STORAGE

How have these issues been addressed? It appears that inadequate inventory control in the past and at present has not and is not getting proper attention. Further, it appears that the serious impacts of mismanagement in these areas and the deleterious impacts on equipment and components resulting from improper storage and inventory control is not even being addressed to either assess the extent of impacts or to fix all problems resulting from a lack of adequate inventory control and proper storage environments. This must be done prior to restart.

27. G-SPECS

The impacts caused by deficient and misused TVA G-SPECS has not been adequately addressed by TVA's current and past actions. Assessments and fixes are required prior to restart.

Refer to Enclosed Item 27, Memo from G. W. Killian to E. A. Merrick, "AUDIT DEVIATION QBP-A-85-0008-D10, APPLICABILITY OF G-SPECS TO OPERATING PLANTS," dated March 13, 1987.

28. ADMINISTRATIVE/PERSONNEL PROBLEMS

Key TVA positions are still filled with personnel who were involved in the forgone problems and some persons have been promoted within the past year after it was known that they have been involved in these activities.

NRC personnel have been protecting status quo and displaying incompetence in understanding and/or believing problems at TVA.

SUMMARY

TVA has done and is doing a lot of work to fix Sequoyah problems, but the scope of that work is not nearly sufficient to address the major concerns revealed by detailed reviews of TVA's past and current practices. With such a large number of deficiencies (such as melted and charred cable insulation, inadequate diesel generator power capability to shut down the plant safely, and hundreds of other problems) existing at Sequoyah while it was operating, it was lucky it did not require some of the critical safety systems and components that are so grossly different in configuration from that which TVA committed to design and construct. Confirmations of shoddy engineering and construction practices, an ineffective quality assurance/quality control program, and TVA's misrepresentations of the plant configuration to the NRC should be grounds to void any initial licensing bases. With

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the items addressed herein and elsewhere, TVA should be required to relicense Sequoyah similar to a new plant, and the NRC should not allow TVA to restart the plant with only commitments to assess and fix problems after restart.

Axelrad  
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ENCLOSURE

ENCLOSED DOCUMENTS

The enclosed documents are numbered with Item Numbers corresponding to the Item Numbers in the preceding summary of TVA-Sequoyah Nuclear Plant Problems.

NOTE: DOCUMENTS NOT RECEIVED BY NRC

6621 Wachese Lane  
Knoxville, TN 37912  
March 28, 1987

Hon. John D. Dingell, Chairman  
Subcommittee on Oversight and Investigations  
United States House of Representatives  
Room 2323  
Rayburn HOB  
Washington, D. C. 20515

Hon. Morris K. Udall, Chairman  
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United States House of Representatives  
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Miss F. - Hermann -  
Person -  
Memoranda -

Please Study them,  
we will need to  
respond. A schedule  
is currently being  
developed -

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Return -

the Tennessee Valley residents. As included in the Enclosure, the documents indicate that a case can be made that TVA's original design, construction, testing, and inspection were grossly different from commitments in the FSAR and from acceptable national standards and practices, and the current TVA plans are inadequate to resolve these problems. TVA simply did not implement its commitments to the NRC, thus voiding the very bases for TVA's operating license for Sequoyah.

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*Dallas R. Hicks*  
Dallas R. Hicks

Enclosure: TVA-SEQUOYAH PROBLEMS

cc: Mr. James Keppler, Director  
NRC Office of Special Projects



Enclosure

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DURING MEETING ON MARCH 23, 1987

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OSP-87-A-0044  
BD/SMITH

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These items  
are not  
license  
not complete

2. FSAR PROBLEMS

OSP-86-A-0062  
BD/PAULITZ

In particular, there is a massive difference between the FSAR and the actual construction configuration. Much of the original design bases had no analytical or logical bases. This further justifies the need for re-licensing efforts.

3. PROBLEM FIXES AT SEQUOYAH POST-RESTART VERSUS PRE-RESTART

OSP-86-A-0039  
JZ/DONOHGW

There are too many things in all areas that TVA is planning and promising to do after restart. Many of these must be fixed before restart due to their serious impacts. TVA has had a long history of promising the NRC that TVA will do something in the future and TVA has not kept its promises. With these endless unfulfilled promises by TVA, the NRC must not grant permission to restart prior to the fixes.

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OSP-87-A-0042  
JZ/DONOHUE

There must be an understanding of each Watts Bar Nuclear Plant concern and an adequate assessment of its applicability to Sequoyah Nuclear Plant prior to restart. TVA personnel claim that they are concentrating on fixing Sequoyah and will do Watts Bar later. They have bid requests issued to potential contractors for the Watts Bar Recovery Program, to supply personnel (between 900 and 1000) for two and a half years. Until TVA adequately assesses, understands, and addresses the problems at Watts Bar, they are incapable of totally understanding the generic implications of the same kinds of problems at Sequoyah.

5. APPENDIX B

OSP-86-A-0161  
BD/GILRAY

TVA has had and still has a generic problem with its implementation of an acceptable Appendix B Program. Until this issue is resolved, TVA cannot be permitted to operate any plants, including Sequoyah.

6. QUALITY ASSURANCE

OSP-86-A-0161  
D/GILRAY

A recent TVA Audit Deviation QWB-A-87-0004-D02, reflects much of the same QA attitude as has existed in the past at TVA.

Refer to Enclosed Item 6, "UPGRADING AUDIT DEVIATION QWB-A-87-004-D02 TO TYPE I," and "COMMENTS" on subject document.

7. CALCULATIONS

OSP-86-A-0046  
BD/GOODWIN

TVA has only scratched the surface in assuring that calculations are adequate in all disciplines. An acceptable calculational basis for items in all disciplines must be in place prior to restart.

Refer to Enclosed Item 8, Memo from W. S. Raughley to Those listed, "POLICY MEMORANDUM PM86-02R1 (EEB) - REVISION 1 - ELECTRICAL CALCULATIONS," dated February 4, 1987.

Refer to Enclosed Item 9, Memo from C. A. Chandley to Those listed, "POLICY MEMORANDUM (MEB) - MECHANICAL CALCULATIONS - MPM86-04," dated JUNE 25, 1986; Memo from C. A. Chandley to Those listed, "SEQUOYAH NUCLEAR PLANT - REVIEW OF ESSENTIAL MECHANICAL CALCULATIONS FOR TECHNICAL ADEQUACY," dated December 17, 1986; Memo from J. C. Key to C. A. Chandley, "SEQUOYAH NUCLEAR PLANT (SQN) - DESIGN CALCULATION REVIEW," dated October 7, 1986; and individual TVA responses to C. A. Chandley concerning the mechanical calculations.

## 8. ELECTRICAL CALCULATIONS

OSP-86-A-0040

BD/GOODWIN

Many of the electrical calculations are committed by TVA to be completed after restart, but this should not be permitted. Many assumptions were made relative to the fact that Sargent and Lundy were told by TVA that certain calculations were not done because the information was contained in design standards or guides. However, since TVA personnel have had such a blatant attitude about downgrading standards, abusing the intent of such documents, and not following them, the design standards and guides could not be relied on to substitute for calculations in many areas. Further, the results of calculations have not been effectively integrated into design and construction documents and criteria. The subject of ineffective integration of and misuse of calculations has not been evaluated for the degrees of problem areas that exist and the magnitude of upgrading required. This should be completed and all fixes made prior to restart.

Refer to Enclosed Item 8, Memo from W. S. Raughley to Those listed, "POLICY MEMORANDUM PM86-02R1 (EEB) - REVISION 1 - ELECTRICAL CALCULATIONS," dated February 4, 1987.

## 9. MECHANICAL CALCULATIONS

OSP-86-A-0040

BD/GOODWIN

TVA is not taking responsibility for vendor calculations and is not independently reviewing and verifying them. The reviews by mechanical personnel are only paper reviews, not technical reviews and are not independent reviews for adequacy in order to scope the problems and to identify the fixes. An independent review, similar to that done by Sargent and Lundy for electrical calculations, should be done for the mechanical calculations. Many of these calculations are missing and many are committed to be done after restart. All should be independently reviewed for adequacy and fixed or done initially (since it appears that many were never done or done properly and recorded) prior to restart. Since TVA personnel have had such a blatant attitude about downgrading standards, abusing their intent, and not following them, the design standards and guides could not be relied on to substitute for calculations where such is being done. Further, the results of calculations have not been effectively integrated into design and construction documents and criteria. The subject of ineffective integration of and misuse of calculations has not been evaluated for the degrees of problem areas that exist and the magnitude of upgrading required. This work should be completed and all fixes made prior to restart.

There is no evidence of TVA's assessing and including mechanical calculations, for non-safety-related systems that could impact safety systems and/or important to safety items that could impact safety systems and/or plant reliability, in their plans for either before or after restart. Calculations for control room filtering (HEPA or other) were not found to be included in TVA's list of calculations.

Refer to Enclosed Item 9, Memo from C. A. Chandley to Those listed, "POLICY MEMORANDUM (MEB) - MECHANICAL CALCULATIONS - MPM86-04," dated JUNE 25, 1986; Memo from C. A. Chandley to Those listed, "SEQUOYAH NUCLEAR PLANT - REVIEW OF ESSENTIAL MECHANICAL CALCULATIONS FOR TECHNICAL ADEQUACY," dated December 17, 1986; Memo from J. C. Key to C. A. Chandley, "SEQUOYAH NUCLEAR PLANT (SQN) - DESIGN CALCULATION REVIEW," dated October 7, 1986; and individual TVA responses to C. A. Chandley concerning the mechanical calculations.

#### 10. ELECTRICAL AND MECHANICAL LOAD CALCULATIONS

OSP-86-A-0040  
BD/GOODWIN  
TVA's current and past actions have not effectively addressed and solved these serious problems. Solutions and fixes are required prior to restart. TVA has not adequately established the calculated and actual bases for each load and has not established a system with traceability of requirements.

Refer to D. Hicks' letter to NRC on Concerns Regarding The TVA Nuclear Program, dated November 27, 1985, and above calculations.

#### 11. MARGINS IN CAPACITY FOR DIESEL GENERATORS AND BATTERY SYSTEMS

OSP-86-A-0075  
Zech  
TVA's current and past actions have not effectively addressed and solved these serious problems. TVA must complete Items 8, 9, and 10 above and integrate actual data from vendor information and from vendor and TVA testing to establish a controlled and traceable load list, clearly identifying margins that exist. Until this is done and TVA corrects deficiencies in these areas and justifies to the NRC that adequate capacity margins do exist in the diesel generators and battery systems, TVA must not be permitted to operate Sequoyah.

Refer to D. Hicks' letter to NRC on Concerns Regarding The TVA Nuclear Program, dated November 27, 1985, and above calculations.

Refer to Enclosed Item 11, "Reportable Event Number 05098," concerning inadequate diesel generator capacity for Sequoyah due to "DESIGN DEFICIENCY," dated June 17, 1986.

12. DESIGN BASELINE AND VERIFICATION PROGRAM

This program only assesses the adequacy of past modification work. One cannot establish the plant configuration, as claimed by TVA, by only assessing modifications and by ignoring the unknown and original base configuration and its problems.

OSP-86-A-0042  
BD/GOODWIN Refer to Enclosed Item 12, Excerpt from "TVA's Nuclear Performance Plan, Vol. II, Section III."

This program does not assess the technical adequacy of the plant systems, but is depending on the calculation reviews for assurance of adequacy. This is a gross fallacy since those reviews are in many areas only a review of paper, not reviews of the technical content of the calculations (example: mechanical calculations).

13. DESIGN CRITERIA

OSP-86-A-0042  
BD/LOMBARDO TVA has been in a mode of evaluating against lesser criteria than standard acceptable criteria and lesser than some of their original criteria. Has the NRC approved less stringent requirements? If so, why?

14. INDEPENDENT NUCLEAR SAFETY REVIEW

TVA claims that the current Nuclear Safety Review Board (NSRB) replaces the functions of the abolished Nuclear Safety Review Staff and that the NSRB chairman has excellent credentials. Enclosed is a news article quoting his philosophy and feelings, as follows:

- OSP-86-A-0006  
ZEC4
- TVA's nuclear plants "are really very nice plants."
- OSP-86-A-0072  
ZEC4
- "As a matter of fact, Sequoyah probably is cursed by being too nice a plant. It is so well built that people have tended to become a little complacent, that this is such a nice plant that it is not going to get into any trouble."
  - Watts Bar Nuclear Plant, southwest of Knoxville, does have "specific, isolated" problems in some areas such as welding, he said. "Some of those need to be fixed. Watts Bar is an extremely stout plant, very well designed and in virtually every instance, very well built. From a simple, direct safety point of view, I wouldn't have any particular qualms about starting that plant up today and running it," he said.

CONCLUSION ON THIS ATTITUDE: How can the current chairman of the NSRB, W. Hannum, with the above attitude, be of use to TVA? How could he give the citizens of the Valley any good feeling that problems

would be viewed realistically and fixed? Is he totally out of touch with reality when there is overwhelming evidence in the hands of investigators and the NRC to refute his beliefs? The problems associated with these plants are widespread.

Refer to Enclosed Item 14, The Knoxville News-Sentinel article, by Laura Simmons, dated March 9, 1987.

#### 15. VOLTAGE PROBLEMS

TVA has not adequately handled impacts of voltage degradation on utilization buses and the problems caused by unacceptable fixes.

OSP-86-A-0062

BD/PAULITZ

Refer to D. Hicks' letter to NRC on Concerns Regarding The TVA Nuclear Program, dated November 27, 1985, and above calculations.

Refer to Enclosed Item 15, NRC Branch Technical Position PSB-1 and TVA NCR BLNEEB0505.

#### 16. CABLING PROBLEMS

OSP-86-A-0062

BD/PAULITZ

All cable calculations and installations need to be verified to be acceptable in areas such as ampacity, insulation types, raceway fills, derating, sidewall pressures, etc. **Sampling should not be permitted.** Every single cable should be verified ~~and done prior to~~ restart. TVA has only scratched the surface in assessing and fixing these problems and it appears that TVA learned very little from the Browns Ferry fire.

#### 17. TVA'S SAMPLING PHILOSOPHY IS TOTALLY UNACCEPTABLE

OSP-87-A-0044

BD/SMITH

For any given type of task, more than one group of people may have done the work in different areas of the plant. Some crews were better than others. A sampling in an area of the plant may cover only one crew's work and not the other crews' work. This and other reasons (such as varying degrees of QA/QC inspection competency, TVA's widespread harassment and intimidation and firing of QA/QC personnel, and the fact that TVA has claimed to be using statistical sampling but has neither substantiated the bases of statistical sampling nor have they used statistical analysts trained in these areas) are sufficient enough to disallow sampling of any item for fixes. Sample looking and sample fixing are not acceptable to assure the public that a plant is safe.

#### 18. INTERFACE CONTROL

TVA has had shoddy and informal control of interfaces between plant systems and the current program has not

effectively addressed this problem and has not fixed the problems that have resulted from this lack of control for many years. This work must be done prior to restart.

#### 19. ENVIRONMENTAL QUALIFICATION

OSP-86-A-0028  
BD/HUBBARD  
TVA has not and cannot do justice to fixing all problems that exist in this area at Sequoyah. Every single safety-related item must be verified that it is adequately qualified and TVA must not just do a sampling. This must be done prior to restart. Much of TVA's efforts have been spent in fixing paper and not in fixing hardware. Why is TVA not being required to test the majority of items that have not been qualified? The limited testing that has been done only scratches the surface of the total scope of problems.

#### 20. PHYSICAL AND ELECTRICAL SEPARATION OF REDUNDANT SYSTEMS AND COMPONENTS

OSP-86-A-0062  
BD/PAULITZ  
Every system must be evaluated and fixed to an acceptable level regardless of any "grandfathering" allowed at the time of the original license since TVA's gross negligence and misrepresentation should have voided any "grandfathering" and paved the way for a total realistic look at what is acceptable.

#### 21. TREATMENT OF FIRE ZONES AND FIRE PROTECTION

OSP-86-0056  
ZCH  
In conjunction with separation, fire zones and fire protection should be reviewed totally for Sequoyah for an acceptable implementation of today's requirements. This should be completed prior to restart. "Grandfathering" should be avoided to maximum extent possible.

#### 22. TVA'S DEFINITION OF REGULATION

OSP-86-A-0060  
BD/GILRAY  
TVA's definition and manipulation of the definition of the word, "regulation," to satisfy its needs and to justify allowing many resolutions to serious problems after restart are unacceptable and should be rejected by the NRC.

TVA personnel continue to claim that they do not have to follow design criteria, Regulatory Guides, TVA Engineering Guides and Standards, national codes and standards, and the FSAR, even though TVA committed to do so and did not seek nor get approval of alternatives. This attitude has been a major contributor to TVA's problems for many years and it can be seen clearly to exist currently. Until this attitude and mode of operation is gone from TVA, TVA can never be expected to correct its massive problems. TVA should never be

allowed to operate any nuclear units until this philosophy is changed.

Refer to Enclosed Item 22, Memo from R. W. Cantrell (attachment principally prepared by T. A. Ippolitto), "SEQUOYAH NUCLEAR PLANT - RESTART REQUIREMENT CRITERIA," dated December 23, 1986.

Refer to Enclosed Item 22, Memo from M. R. Harding to L. M. Nobles and D. W. Wilson, "SEQUOYAH NUCLEAR PLANT - 10 CFR 50.59 EVALUATIONS," dated January 28, 1987.

Refer to Enclosed Item 22, TVA'S "GUIDELINES FOR POTENTIAL OPERABILITY DETERMINATIONS."

23. LACK OF ACCEPTANCE CRITERIA FOR INSTALLATION AND TESTING OF EQUIPMENT AND OTHER ITEMS

OSP-86-A-004<sup>8</sup>  
BD/PAULITZ Has TVA assured that each test was done properly or redone to acceptable criteria? Are there test records substantiating such? This verification must be done prior to restart and no sampling should be permitted.

24. SEISMIC CALCULATIONS

OSP-86-A-0004  
BD/CHENG Seismic hold-down forces for equipment and other items are not addressed in any detail in electrical and mechanical calculations.

There is a major question as to whether these have been verified and calculated and/or recalculated to acceptable criteria. 100 percent verification must be done prior to restart.

25. AS-CONSTRUCTED DOCUMENTATION

OSP-86-A-0063  
BD/PERSON There is conflicting information given in presentations and in written material as to TVA's intent on as-constructed versus as-engineered drawings. This documentation should be completed prior to any restart and the control room/shift engineer/operators must have documentation that is per the construction configuration and per the available drawings stored in all plant and central office files.

TVA has failed to independently review and adequately challenge vendor calculations and design drawings and documents. TVA has failed to take responsibility for vendor work. TVA must take this major responsibility regardless of whether TVA or a contractor does work.



26. INVENTORY CONTROL AND IMPROPER STORAGE

How have these issues been addressed? It appears that inadequate inventory control in the past and at present has not and is not getting proper attention. Further, it appears that the serious impacts of mismanagement in these areas and the deleterious impacts on equipment and components resulting from improper storage and inventory control is not even being addressed to either assess the extent of impacts or to fix all problems resulting from a lack of adequate inventory control and proper storage environments. This must be done prior to restart.

OSP-86-A-0056  
zsch

27. G-SPECS

The impacts caused by deficient and misused TVA G-SPECS has not been adequately addressed by TVA's current and past actions. Assessments and fixes are required prior to restart.

8D

Refer to Enclosed Item 27, Memo from G. W. Killian to E. A. Merrick, "AUDIT DEVIATION QBF-A-85-0008-D10. APPLICABILITY OF G-SPECS TO OPERATING PLANTS," dated March 13, 1987.

28. ADMINISTRATIVE/PERSONNEL PROBLEMS

Key TVA positions are still filled with personnel who were involved in the forgone problems and some persons have been promoted within the past year after it was known that they have been involved in these activities.

OSP-86-A-0001  
OSP-86-A-0003  
RD/GOODMAN

NRC personnel have been protecting status quo and displaying incompetence in understanding and/or believing problems at TVA.

SUMMARY

TVA has done and is doing a lot of work to fix Sequoyah problems, but the scope of that work is not nearly sufficient to address the major concerns revealed by detailed reviews of TVA's past and current practices. With such a large number of deficiencies (such as melted and charred cable insulation, inadequate diesel generator power capability to shut down the plant safely, and hundreds of other problems) existing at Sequoyah while it was operating, it was lucky it did not require some of the critical safety systems and components that are so grossly different in configuration from that which TVA committed to design and construct. Confirmations of shoddy engineering and construction practices, an ineffective quality assurance/quality control program, and TVA's misrepresentations of the plant configuration to the NRC should be grounds to void any initial licensing bases. With

the items addressed herein and elsewhere, TVA should be required to relicense Sequoyah similar to a new plant, and the NRC should not allow TVA to restart the plant with only commitments to assess and fix problems after restart.

ENCLOSURE

ENCLOSED DOCUMENTS

The enclosed documents are numbered with Item Numbers corresponding to the Item Numbers in the preceding summary of TVA-Sequoyah Nuclear Plant Problems.

10/13  
\$20

To: June 2 Incident  
From: CIA  
3 pages

copy to  
Steve  
Return  
my Co  
me

July 21, 1987

To Harold Denton  
From Henry Myers HM

RE: NRC ACTIONS CONCERNING RESTART OF SEQUOYAH

The following questions pertaining to the NRC's review of Sequoyah have emerged from our inquiry into NRC's regulation of TVA's nuclear program.

SFE  
ATTACHED

1. On March 28, 1987 Mr. Dallas Hicks sent to Chairmen Udall and Dingell a letter enumerating 28 items pertaining to Sequoyah. On April 9, the Chairman transmitted Mr. Hicks' letter to the Commission requesting the Commission's position with respect to the items in Mr. Hicks' letter. To which of the 28 items enumerated in Mr. Hicks' March 28 letter to Chairmen Udall and Dingell will there be a substantive response prior to Sequoyah restart?

BD

2. Which of the issues enumerated in Commissioner Asselstine's March 18, 1987 memo to Mr. Stello does the NRC staff consider adequately addressed by TVA in its June 10, 1987 response to the NRC? With respect to each such issue, what is the nature of analysis, inspection, and/or hardware modification that will be required prior to restart of Sequoyah?

GZ

3. TVA has underway an upgrading of design criteria, standards, specifications, G-Specs, procedures, and other documents that govern plant operations, maintenance and modification. Certain plant modifications will result from this upgrading of such criteria, etc. To what extent does the NRC intend to develop a comprehensive check list of items required for completion prior to restart?

BD  
C. H. H. H.

4. Following the "vertical slice" independent review of the Sequoyah ERCW System, what criteria will the NRC use in determining which problems, identified as a result of this review, shall be corrected prior to Sequoyah restart? What criteria will the NRC apply in determining whether the results of the ERCW review indicate the necessity of additional reviews prior to Sequoyah restart?

JZ

5. Which of the items designated by TVA as Conditions Adverse to Quality (CAQs) will be required to be resolved through inspections and/or hardware modifications prior to restart of Sequoyah?

JZ

6. Has NRC evaluated the adequacy of TVA's program for addressing employee concerns? What is the result of that evaluation? What criteria will the NRC apply in determining whether, prior to Sequoyah restart, TVA will be required to resolve specific employee concerns?

L-6

BD 7. Prior to Sequoyah restart, what will the NRC require with respect to a determination of the applicability to Sequoyah of deficiencies identified at Watts Bar through the Black & Veatch review, NSRS reviews, INPO and NRC inspections, and the employee concerns program? What criteria will the NRC apply in determining whether items, identified at Watts Bar and having generic applicability at Sequoyah, will need to be resolved prior to Sequoyah restart through design modifications, inspections, and/or hardware modifications?

JZ 8. Prior to Sequoyah restart, will the NRC require that TVA certify that Sequoyah complies with licensing commitments and all applicable Commission requirements?

BD 9. Given the history of TVA failing to comply with the requirements of 10CFR50, what actions will the NRC take prior to Sequoyah restart in order to determine that adherence to Appendix B has been achieved at Sequoyah and within other TVA organizations upon which the safe operation of Sequoyah depends?

BD 10. What will the NRC require with respect to recalculations and/or review of calculations for safety-related items, associated Class IE items, and nonsafety-related items that could impact safety-related items? What criteria will the NRC apply with respect to determining what plant modifications will be required as a result of recalculations and/or review of calculations?

GE 11. To what extent will the NRC review the acceptability of TVA's revised diesel generator load sequencing calculations and operating modes to assure sufficient diesel generator system capacity margin to shut down the plant during a plant emergency? To what extent will the NRC review the acceptability of TVA's battery systems to assure sufficient battery system capacity margin to shut down the plant during a plant emergency?

BD 12. To what extent does the NRC intend to verify that problems identified by the DBVP have solutions and that necessary modifications have been made prior to Sequoyah restart? Which of the programs, enumerated in the NRC handout (attached hereto) at the July 8, 1987 NRC/TVA meeting in Chatanooga, will be required by NRC to be completed prior to Sequoyah restart?

BD 13. What does the NRC plan to require from TVA to assure that the new design change control system is in place and working properly? Is the NRC aware of the number of design changes and field changes that were made during the period ranging from mid-1986 through mid-1987 on the basis of waivers and/or variances from the new design change control program? Will the NRC require prior to Sequoyah restart that TVA (A) verify that these changes are consistent with the plant baseline configuration, (B) assure that all impacts resulting from these reviews are assessed, and (C) assure that any resulting plant modifications are completed?

14. Does the NRC plan to require TVA to complete ongoing assessments and corrective actions concerning cables prior to Sequoyah restart?  
BD

15. What NRC actions are underway for the purpose of resolving questions concerning what constitutes acceptable sampling techniques? What is the nature of outstanding questions regarding the adequacy of TVA's sampling practices? When will any such questions be resolved?  
BD

16. Will the NRC require that testing of Sequoyah systems and components, undertaken between shutdown and restart, be conducted in accord with standards, guides, test procedures, etc. that will be in effect at the time of restart?  
GZ

17. What is the impact upon the Sequoyah restart schedule of the deficient conditions described in TVA's report, "A REVIEW OF CAQ PROGRAM IMPLEMENTATION AT SEQUOYAH NUCLEAR PLANT?" This report concluded:  
JZ

The corrective action program is not being adequately implemented at SQN and could not withstand an NRC inspection. Unless expeditious corrective action is taken, the unit 2 startup schedule may be affected.

Copy #3  
# 20

Copy #3  
F. L.  
T. J. Johnson  
Banner  
before Tri TVA mtg

August 13, 1985

To Bill Dircks, Carl Kammerer  
From Henry Myers

DE  
8/15

Re: TVA

I am enclosing herewith a series of memoranda I have sent NRC staff on June 3, June 10, June 24 and July 1 concerning the Black & Veatch (B&V) review of Watts Bar. These memoranda convey a sense of the issues not resolved by B&V and TVA's response thereto.

I want also to urge that the report of the ongoing NRC staff review of TVA's welding program include a full listing of documents that were analyzed in the course of this review including TVA audit reports, TVA nonconformance reports, 50.55e reports pertaining to TVA welding and/or weld program deficiencies, NRC inspection reports containing welding related items, Nuclear Safety Review Staff reports pertaining to TVA weld programs, reports based on welding-related allegations made to the Quality Technology Company (QTC), and miscellaneous documents related to welding. Without such a document listing it will be impossible to assess the validity of the staff's findings.

I would appreciate your providing me all reports made by staff to the Commission and/or EDO with respect to the following:

-NRC staff review of TVA NSRS reports on cable installation and procurement.

-NRC staff's monitoring of the weekly logs produced by QTC and reports resulting from inquiries into allegations made to QTC.

-50.55e reports resulting from the QTC activity. (For example, how many such reports have resulted from the QTC effort?)

Our ongoing inquiry raises the following questions:

-Does there exist a process that assures that the Commission and the Directors of NRR and I&E and their principal deputies receive accurate and comprehensive information concerning the TVA situation?

-What plans exist to determine which TVA personnel have been subject of discriminatory personnel actions as a consequence of advocacy of compliance with NRC regulations? What actions are planned to insure that persons subject to such discriminatory action will receive appropriate compensation; e.g. promotion to grade levels which would have been achieved had the discrimination not occurred; award of compensatory damages, etc?

L-7  
~~Handwritten signature~~