



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 16, 1985

Docket Nos: 50-390, 50-391
and 50-438, 50-439

Mr. H. G. Parris
Manager of Power
Tennessee Valley Authority
500A Chestnut Street, Tower II
Chattanooga, Tennessee 37401

Dear Mr. Parris:

Subject: Concerns Regarding TVA Construction Sites

Enclosure 1 lists eleven concerns about your Watts Bar facility that have been communicated to the NRC. We ask that you review these concerns and take appropriate steps to assure that your programs and implementation of those programs in these areas are adequate to meet applicable requirements and to support safe operation of the facility. Furthermore, we ask that you address any generic implications of these issues. We recognize that some of these concerns are not very specific. However, that lack of specificity should not lead you to assume there is no basis for concern. Your review of these matters should be broad enough for you to certify the safety significance of these concerns. Pursuant to Section 182 of the Atomic Energy Act of 1954, as amended, we ask that you provide the results of your review as soon as possible to assist us in our evaluation of these concerns. Enclosure 2 lists a number of questions that we have regarding these concerns. Please provide us with your response as soon as possible.

We also ask that you identify any outstanding cases currently under review by TVA's Office of the General Counsel regarding employee harassment, reprisals or intimidation.

We recently received some additional concerns (see Enclosure 3) regarding both your Watts Bar and Bellefonte facilities. You should review these to determine that no new issues related to safe plant operation have been identified. We regret some omissions occur, but this is how they were received by us.

I suggest we meet as soon as you are prepared to discuss your schedule for responding to this letter. Should you have any questions on this matter, please refer them to E. Adensam of my staff on FTS 492-7831.

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PDR ADOCK 05000390
A PDR

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,



Hugh L. Thompson, Jr. Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosures:
As stated

cc: See next page

WATTS BAR

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ENCLOSURE 1

CONCERNS RELATED TO WATTS BAR

1. A concern has been expressed that there is no material control of ASME bolts smaller than 1"; and, therefore, the bolts <1" are mixed up and no one knows where the good ones are.
2. A concern has been expressed that electrical hangers have been modified after their initial inspection and not reinspected.
3. A concern has been expressed that field modifications have been implemented on components, piping, supports, structures, and embedments that resulted in no accurate records of total loads on these elements.
4. A concern has been expressed that the cumulative effect of tolerances has not been factored into the design and drawings, especially with respect to hanger location.
5. Several concerns have been raised regarding the Independent Design Verification Program conducted by Black & Veatch. These are:
 - a) a concern regarding the close out of about 500 items,
 - b) a concern that only one construction specification was looked at by Black & Veatch in their review,
 - c) a concern that Black & Veatch did not know how the plant was actually built, and
 - d) a concern that Black & Veatch only compared the system's design and construction to its design criteria, not to the underlying regulatory criteria.
6. A concern was expressed with respect to the use of three Q lists that all differ.
7. A concern was expressed that the method of identifying NCR's and the use of the Inspection Rejection Notice (IRN) system effectively negated the NCR process. It was submitted this was so because an NCR was only generated when 1) the equipment/component/system/etc. had been previously inspected and accepted; 2) the records for that inspection were in the vault, and 3) there was a subsequent discovery that something was wrong; however, if there were a problem identified in an initial inspection an IRN is generated.

8. A concern has been expressed with respect to structural steel welding requirements in that TVA is using a different code than the code normally used by the industry for structural steel welding.
9. A concern has been expressed that in FSAR amendment #53 TVA lessened the experience requirements for the plant manager.
10. A concern has been expressed regarding weld filler material control, especially in the area of storage and issuance of materials.
11. A concern has been made that the Quality Assurance (QA) organization at construction sites lacks the independence required by NRC regulations. Also the statement was made that inadequate QA organization independence problems were identified in a Management Analysis Company (MAC) report, "Assessment of Organizational Change in the Tennessee Valley Authority Power Program and the Nuclear Quality Assurance Program."

ENCLOSURE 2

QUESTIONS ON WATTS BAR CONCERNS

1. With respect to concern 1 our initial inspection during the week of April 29, 1985, identified instances where unmarked bolts were installed in the facility on ASME components and supports. In addition, the staff also learned that two NCRs (1979 and 1981) have been issued regarding the purchasing and installation of bolts without required markings. Describe the reasons for the apparent QC breakdown in bolt control, the reason for the repeated NCR in 1981 and your evaluation of whether this occurred in other QC areas. In view of the above, what is your basis for determining compliance with criterion VIII of Appendix B to 10 CFR 50? If documentation does not exist which demonstrates compliance with this regulation, describe the process and provide sample documentation which leads you to conclude that you comply with this regulation. Demonstrate that bolts less than 1", which have been installed, comply with all applicable ASME Code requirements related to identification and control.
2. With respect to concern 2, please review your records to determine if such modifications have occurred and, if they did, what assurance you have that the modifications have been properly reinspected. This review should include applicable work requests. Verify that documentation exists to demonstrate that modified electrical hangers were designed and constructed pursuant to applicable FSAR commitments. To the extent such documentation does not exist, what is the basis for concluding that electrical hangers, as currently installed, comply with 10 CFR 50, Appendix B, Criterion X?
3. With respect to concerns 3 and 4, 50.55 Interim Report No. 1 on NRC WBNCB8419 states that TVA's drawing series 47A050 includes several tolerances (e.g., location of concrete anchorages, movement of attachments, and modification of baseplates) such that the cumulative effect of these tolerances may result in significant increases in baseplate stresses and anchor bolt loads. Interim Report No. 1 also states that there is no evidence that these potential increases due to cumulative effects were considered in the design of various supports and that the cumulative effect of these tolerances could increase baseplate stress by 150% and anchor bolt load by 50%. Provide the TVA engineering specifications establishing acceptable dimensional installation tolerances for supports, baseplates, and anchorages. Provide the analytical bases for establishing the above procedures which demonstrate that the effect the tolerances have on the stresses on loads in interfacing components and structures will cause these values to exceed their allowable limits. Provide the process used when field modifications are made and confirm that each modification exceeding TVA engineering specification installation tolerances has been analyzed to demonstrate continued compliance with design allowable parameters. Provide sample documentation which demonstrates how this process has been used.

4. With respect to concern 5, please review this concern to determine no new issues are raised which would impact your assurance that the Black & Veatch review was properly designed and conducted and that TVA's close out of identified open items was consistent with your licensing commitments and safe operation of the plant.

In addition, please address the following questions:

The NRC staff can identify only one General Construction Specification (GCS-G-32) in the documents reviewed by B&V. How many other General Construction Specifications are applicable to the auxiliary feedwater system? If you identify other applicable General Construction Specifications that were not reviewed by B&V, how could TVA use B&V to support a conclusion that construction complied with the FSAR commitment? What corrective actions (i.e., design, hardware, procedural modifications) have been taken as a result of the B&V review? Does B&V agree that these actions resolve the concerns expressed in the B&V findings? What specific actions have been taken in systems other than the Auxiliary Feedwater System to determine the extent to which deviations found by B&V in the AFW system existed in other systems? How have such actions been documented?

5. With respect to concern 6, identify the documents that demonstrate your compliance with Criterion II, Appendix B, 10CFR Part 50, for maintaining a Q list from the date of the construction permit (CP).
6. With respect to concern 7, is this a proper description of the NCR process? Please verify and certify that reporting of deficiencies meets your licensing commitments and the regulations and that IRN's and NCR's are properly controlled. Is there a master file of IRN's and their resolutions? You may wish to consider having your Quality Technology Company Employee Response Team solicit employee views regarding improper use of the IRN process in lieu of the NCR process.
7. With respect to concern 8 please verify your code use for this welding to assure regulations and licensing commitments have been met. Verify your implementation of other types of welding conformed to the accepted standards. Please provide memoranda or other documents indicating problems with TVA's AWS welding program not previously provided to NRC.
8. With respect to concern 10, how does your program assure the ASME Code requirements of 10 CFR 50.55a are met and 10 CFR Part 50, Appendix B Criterion VIII traceability requirements are met. To what version of the ASME Code was TVA committed in the CP? Did this version of the ASME code require traceability of filler material to welds by heat and lot numbers? What internal or external approvals for your program were required and received?

What version of the specification GCS-G29M, Process Specification 1.M.3.2(R0) & 1.M.3.1(R7) was used prior to 1/12/83 and 1/13/83? There appears to be an inconsistency between these two process specifications in that 1.M.3.2(R0) for power boilers is more stringent than 1.M.3.1 (R7) for nuclear plants. Describe how TVA is implementing these process specifications in the current version of GCS-G29M in the field?

9. With respect to concern 11, describe the adequacy of the independence of the QA organization as it applies to Watts Bar. In addition, describe actions taken by TVA to resolve problems identified in the MAC report and actions TVA is taking with respect to the report's recommendations. Provide any analysis which has been conducted by TVA to determine the extent to which Watts Bar design and construction quality may have been compromised as a consequence of deficiencies enumerated by the MAC report. If no analysis has been conducted, do you intend to conduct such an analysis? If not, why not?

Enclosure 3

Electrical, I&C and Diesel Generators

- ° Electrical and I&C Regulations (Reg. Guides, NUREGs, Bulletins and Notices) have been ignored and violated to a very large degree at all plants.
 - Caused by a lack of knowledge by personnel
 - Caused by a poor attitude toward safety and regulations by personnel
 - Caused by a lack of knowledge of industry positions on regulations

- ° 5% voltage drop at each plant causes problems
 - Cycles diesel generators unnecessarily, degrading reliability
 - Too many plant shutdowns
 - TVA compensates by operating buses at higher than normal voltage ratings, anticipating voltage reductions, stressing equipment and components unnecessarily and reducing their lives and reliabilities
 - Inadequate voltage regulation for buses

- ° Diesel Generator margins inadequate
 - TVA has added DGs to BF, Sequoyah and Watts Bar
 - Each time a question is raised, TVA must conduct another study
 - TVA adds [illegible] without upgrading licensing documentation

- ° Diesel generator reliability problems
 - Requires reliability upgrading program
 - Requires reduction in number of starts
 - Requires much attention given to testing program
 - Requires preventative maintenance upgrading program
 - Requires more interaction with INPO and other utilities, as well as vendors, to establish resolutions to problems

- ° Electrical separation and physical separation of redundant wiring and cabling and for equipment and components are all inadequate at all plants
 - Detailed reviews need to be made (They are so extensive that a consultant probably should be used, providing independence from TVA)
- ° Environmental Qualification of electrical and I&C equipment and components is inadequate at all plants
 - Qualification was often not done
 - If done, records do not exist in many cases, resulting in requalification or replacement of items
 - Current upgrade programs needs scrutiny
- ° WBN - (maybe other plants) Class 1E and Non-Class 1E Batteries are unacceptably supported (no battery tie-downs)
 - Unistrut supports unacceptably used
- ° Human Factors engineering and/or reviews have not been implemented for control panels and stations at WBN (possibly other plants also) - Violation of intent of NUREG-0700
 - Too many poor engineering practices in this area
- ° Out of service tags for valves, electrical equipment, etc., at Bellefonte have been violated everywhere
 - Extremely serious personnel safety problem
- ° Thermal overload bypass and indication problems at WBN - probably have similar problems meeting Reg. Guide 1.97 at other plants
- ° There are cable ampacity problems at WBN where derating was not properly considered
 - Probably problems at other plants
- ° Inadequate management, control and status listing of a.c. and d.c. electrical loads, including diesel generator loads

- Inadequate control of or preparation of calculations for loads
- Inadequate management and control of load margins, including electrical loads and mechanical loads (heat, BHP, etc) that translate into electrical loads
- ° Cable tray fill criteria of 60% for I&C cables is inadequate
 - National Electrical Code allows 40% and 50% on exception basis. TVA violates code
 - Industry practice is 40%
 - The situation is even worse with the addition of spray-on fire retardent materials which take up space in trays
- ° Cable pull tension monitoring is lax
- ° Cable bending radii problems
- ° Computer cable routing program inadequate and its status system is inadequate
- ° Cable trays are too heavily filled; cables [illegible]
- ° Cable megger readings are not stored as QA records, losing traceability
- ° Construction Test and Installation Specs (Called General Construction Specs with G- numbers) are often incomplete and inadequate
- ° Electrical testing and planning inadequate
 - Engineering either does not address testing or does so inadequately
 - Acceptance criteria is inadequate to nonexistent
- ° Electrical Standards and Guides are treated as guides and are not adequately incorporated in design criteria as requirements
- ° Electrical design criteria, where it exists, is not complete, is vague, and in general is inadequate

- Cabling is routed outside trays, coiled on tray supports or floors, tied on sides of trays and supports, tied on bottoms of trays, etc. All this and more exists at WBN, where extremely bad cable practices exist such as the above and 90° wire bends [illegible]
- Between 400 and 500 breakers were unacceptably set at WBN. EN DES practices and attitudes concerning these were poor. The National Electrical Code and good engineering practices were violated.
- Many cable trays at WBN are full, some exceeding 100% tray capacities, and they are not identified at site or in computer status as full
- Wall penetrations of cable trays are not identified by name and/or number at WBN
- Lighting fixtures at WBN are not properly restrained and caged to prevent them from becoming missiles or swinging missiles during seismic events
- WBN - (and Possibly other plants) - Unistrut material is used to support instruments, pipes, conduit, control stations and panels, fluid piping on skids, instrument lines, CO₂ fire protection piping, fire protection water piping, lighting, etc.
 - All unacceptable use for Seismic Category 1 support
 - Items supported as such may either fail or become missiles to cause other [illegible]
- TVA commitments in FSAR, SER, and NRC Question Responses are treated lightly and are not being met in a wide number of areas
 - Personnel do not follow regulations and commitments, and do not think they even need to report deviations or change commitments and obtain NRC acceptance
- TVA safety and licensing evaluations by EN DES (Including NEB) are inadequate and appear too much in cover up mode
- TVA personnel have attitude problems in meeting regulatory commitments

- Too many crafts and others on site at WBN
- Gross lack of knowledge of regulations and their seriousness by TVA personnel at all levels
- Lack of frequent visits to sites by Designers
- Communications problems among designers, constructors and operation personnel
- Procurement specs, drawings and vendor supplied documents not per as-built and/or as delivered configurations
 - TVA inadequately reviews vendor work
 - TVA receipt and inspection of equipment are inadequate (Example: TVA in many cases does not inspect until ready to install - not when received)
- Construction process does not always follow EN DES requirements documents or vendor requirements/instructions
 - These do not always get included on as-built documents
 - Too much after-the-fact approval
 - QC inspection is often inadequate - (It only takes a walk thru a plant such as WBN to see examples everywhere)
- Engineering (EN DES) inadequately addresses and considers operation, maintenance, testing and construction requirements and general industry practices, in the design process
 - There are no forced interactions with other utilities
 - There is no formal system to track and assign commitments for problems identified to INPO
 - There is poor tracking of NRC experience information
- Improper reporting of events at operating plants or in design/construction
 - TVA personnel are inadequately trained and not knowledgeable in what is reportable

- Lack of adequate (or any) configuration control (management) in EN DES or at sites
 - Poor interface control between systems
- Lack of traceability of design requirements
 - Standard answer is "Its TVA Practice"
- Design/installation drawings do not always represent or include design requirements
 - Design guides or standards are utilized only when designer wants to use them
 - Design guides/standards inadequate in many areas
 - These are misused - applicable parts are [Illegible]
- Material control is poor
 - Traceability of requirements, paperwork, and materials are inadequate
 - Paperwork for quality records is poor
 - Storage requirements implementation is poor
 - Handling of equipment in storage and during and after construction is poor. WBN equipment in many cases is in poor condition and filthy dirty inside and outside
 - Equipment receipt and inspection is inadequate (identified previously)
 - These problems exist at Bellefonte and WBN (probably elsewhere)
- Lack of adequate tracking for EN DES commitments and design changes
- Lack of good status system (punch lists) for completion of commitments and completion of NRC actions, and completion of work at sites. Plant construction, pre-op, etc. status is poor
- Project Engineering inadequate (or nonexistent) to incorporate TVA and industry operating [Illegible]

- Calculation Problems
 - Some are not ever prepared
 - Some are inadequate in scope and quality
 - Some are not stored as quality records, but are destroyed
 - Traceability of design requirements is impacted due to above problems
 - There is inadequate interface control and control of calculations
- TVA has set up design criteria (WBN) and, after the fact, have inactivated a large percentage of criteria
- As-Built drawings and documents are nonexistent or in poor condition in many cases
- TVA does not adequately (or at all) independently verify vendor calculations or designs.
 - There are no design reviews of vendor design
- TVA does not conduct independent design reviews of its work
- QA has not effectively audited the design and construction process
- Lack of coordination of effects of upcoming (near or long term) design changes with all disciplines and site construction
 - inadequate evaluation of impacts (not under configuration control)
- Lack of accountability of TVA personnel and management for not following procedures, regulations, etc. and for not doing adequate and acceptable job
- Too much blame on QA for quality problems versus emphasizing and demanding an ethic to do it right the first time. Put quality into design and construction

- Commitment (action) system in TVA nonexistent
 - No action party and schedule
- Lack of effective communications and interface control among organizations with EN DES - Branches, Projects, Procurement, etc.
- Protective and defensive attitudes of NEB and various Branch/Project groups concerning problems rather than an attitude to admit [Illegible]
- Lack of proper environments and fire protection in equipment storage areas
- Lack of knowledge (on site and in EN DES) as to status of QCIRs and IRNs
- Untimely closeout of ECNs
 - Lack of knowledge of status of ECNs or designs affected