

Official copy

December 22, 1994

Tennessee Valley Authority
ATTN: Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: STAFF'S ASSESSMENT OF TVA'S PROBLEMS AT WATTS BAR NUCLEAR PLANT

Gentlemen:

In management meetings on October 19, 1994, and numerous recent inspection reports, the staff described deficiencies in TVA's implementation of various corrective action programs (CAPs) and special programs (SPs), and gave several examples of inadequate implementation by TVA of specific corrective actions. These deficiencies have raised concerns about TVA's ability to correct problems that must be resolved before Watts Bar can be licensed to operate. The staff has conducted an independent assessment of the problems. Our assessment, which is enclosed for your information, generally agrees with the assessment that you sent to us in your letter dated November 14, 1994.

We believe that your current efforts to address the root causes of these problems must be pursued vigorously in order for the NRC to develop confidence that TVA has institutionalized management expectations concerning quality and accountability at all levels within the Watts Bar organization.

Sincerely,

ORIGINAL SIGNED BY
LUIS A. REYES/for

Stewart D. Ebnetter
Regional Administrator

Docket No. 50-390
License No. CPPR-91

Enclosure: NRC Staff Assessment

cc w/enclosure: (See page 2)

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STAFF ASSESSMENT OF WATTS BAR PERFORMANCE

AREAS OF CONSTRUCTION PERFORMANCE

There are three main functional areas that define construction performance at Watts Bar: site management, engineering and modifications (or craft), and quality assurance/quality control (QA/QC).

1. Site Management

The staff believes that at Watts Bar, both site and corporate management placed disproportionate emphasis on the rate of work accomplishment as compared to the emphasis it placed on quality verification. This imposes a scheduler pressure, which although a normal aspect of construction completion, must be controlled to ensure that quality is not compromised. In several instances, TVA declared that major construction activities such as corrective action programs (CAPs) and special programs (SPs) were ready for inspection in accordance with a scheduled date, only to be later found deficient either by the NRC during the inspection or by TVA just prior to the NRC inspection.

The staff concluded that the TVA management's disproportionate emphasis on work performance resulted in some degradation of long-term quality accountability on the part of the TVA staff at the site. Short-term goals and tasks were emphasized by TVA management, but a sense of individual or personal responsibility seemed lacking at many points in the organization. Such activities as CAPs, SPs, and systems had "groups of owners," resulting in diffused responsibility and lessened accountability.

Continual turnover at the middle management and supervisory levels has contributed to the lack of accountability. It has meant a lack of continuity and a change of direction, which have not been conducive to consistency of purpose and can result in mixed expectations at the line level. Most TVA managers lack longevity at Watts Bar. Since the construction restart in 1991, with the exception of the Vice President, New Plant Completion, all senior managers have changed. These changes include, but are not limited to, the Site Vice President, Startup Manager, Plant Manager, Licensing Manager, QA Manager, Modification Manager, and Projects Manager. The ability to license Watts Bar depends largely on TVA successfully implementing the numerous corrective action commitments made between 1986 and 1989. Implementation of these corrective actions, in turn, depends on management's detailed awareness of and strong commitment to these requirements. The continuing management changes have contributed to instances wherein the same mistakes have been repeated and original problems have not been corrected. As management at the site has changed, the reasons for some corrective actions and programs appear to be no longer well understood. This has made successful completion of the older corrective actions and prevention of recurrence very difficult.

Enclosure

Site management in some cases has limited its perspective to immediate construction issues and does not consider the long-term effects on operations. Noted hardware deficiencies have been routinely challenged by TVA management as not being important to safety unless the hardware has actually failed. With this view, site management perspective has limited the boundary of problems and determinations of root causes to very narrow corrective actions.

An observed weakness was the failure of construction and engineering management to establish, communicate, and enforce appropriate quality standards for construction. Management's expectation appeared to be based on its perception of the minimum quality level that might be acceptable to the NRC.

TVA's narrow view of root cause is responsible for ineffective corrective action such as counselling its staff rather than retraining it, and using engineering rationale to accept as-installed or as-constructed work that varies from drawings.

2. Engineering and Modifications

Engineering and Modifications are the major line organizations working to complete construction at Watts Bar. Although the majority of CAPs and SPs have been conducted acceptably at the 75 percent goal and are proceeding on track toward completion, several failures to achieve required quality levels have occurred, especially in the implementation of electrical CAPs. The fact that NRC inspections reveal any significant problems in what is essentially corrective action work is disturbing. Some specific electrical work has been poorly implemented.

Most of the recent construction work at Watts Bar involves correcting preexisting problems. Because TVA devoted inadequate attention to the identification of root causes and implementation of effective recurrence controls, TVA has had to develop and implement additional corrective actions to ensure that design output will be met. The cable splice issue, the Kapton insulation of electrical penetrations issue, and the essential raw cooling water (ERCW) pump drain line problem are specific examples of ineffective rework. TVA personnel exhibited little sense of ownership and accountability for the quality of plant construction. Independent reviews of Engineering and Modifications activities have demonstrated that management expectations have not reached the working level uniformly, and assumption of responsibility by the lower levels of the line organization has not been universal. This is compounded in the electrical area by a tendency to focus on the completion of specific subtasks, while neglecting to view the actions of plant personnel as a part of the whole to resolve the fundamental problem. If a sense of ownership were instilled in the line organization, people involved with work would ensure that problems were solved.

3. Quality Assurance and Quality Control

Quality assurance (QA) and quality control (QC) should serve as the safety net at Watts Bar that ensures quality levels have been achieved. However, the recently identified hardware problems cast doubt on recent performance of QC, because NRC uncovered the problems after QC failed to find the inadequate implementation of the electrical and cable CAPs and some other defects.

TVA management has not effectively utilized the Quality organization and its role in ensuring that Watts Bar is constructed in accordance with applicable standards and commitments. The Watts Bar Quality organization has not been given a commanding, visible role in setting the standards and ensuring quality performance at Watts Bar. As a result, the Quality organization has lacked aggressiveness in ensuring that appropriate QC or line verification activities are specified for important, safety-related work. The staff noted, during several CAP and SP inspections, that QA reviews had been inadequate.

Watts Bar is extensively inspected by the NRC staff. One unfortunate aspect of such extensive inspection is that the NRC staff has tended to become the mechanism for setting quality standards for Watts Bar, to varying degrees supplanting TVA's Quality organization.

RECENT IMPROVEMENTS IN CONSTRUCTION PERFORMANCE

As a result of the assessment described in TVA's letter dated November 14, 1994, TVA has implemented changes at Watts Bar to correct the deficiencies identified by the staff.

Notwithstanding the additional deficiencies discussed above, the staff found some areas in which TVA's programmatic corrective actions related to quality issues have improved since the July 1994 corrective action inspection. TVA's recognition, identification, and documentation of adverse conditions on corrective action documents has improved. This improvement is evidenced by the number and type of issues now being documented on various corrective action vehicles. Discussions with line personnel indicate that TVA's new CAP guidance documents, training, and rigorous screening of closure packages have improved its understanding of the importance and value of properly and fully implementing the CAP. The staff recognizes site management's acknowledgement that specific discrepancies (whether hardware, performance, or documentation) are often symptoms of larger programmatic and cultural issues that must be resolved before an operating license is issued.

OVERALL ASSESSMENT AND RECOMMENDATIONS

TVA management must exercise adequate control to ensure that work priorities to complete construction do not override quality. The staff concludes that the recent issues in the electrical construction area at Watts Bar are

directly related to a lack of management oversight, management expectations that have not been transmitted to the line organization, and inadequate quality assurance. Management oversight has been ineffective because of the lack of accountability and weak utilization of such feedback systems as quality control. The frequent changes in management and leadership with the attendant confusion in expectations and standards have contributed to the problem. TVA must improve accountability throughout the organization. The sense of ownership and the pride of workmanship should be woven into the fabric of the Watts Bar organization. TVA management must establish quality standards and use the QA organization proactively to verify that these expectations are met.

In addition to short-term improvements, TVA needs to demonstrate sustained, satisfactory performance.