TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
6N 38A Lookout Place

MAR 31 1988

Mr. Stewart D. Ebneter, Director
Office of Special Projects
U.S. Nuclear Regulatory Commission
MS 7D24
Washington, D.C. 20555

Dear Mr. Ebneter:

WATTS BAR NUCLEAR PLANT (WBN) COMPLETION PROGRAM PLAN

Enclosed is a revised description of the WBN completion program plan. This revision is in response to your letter dated February 17, 1988. In particular: (1) E. D. Fuller has replaced R. A. Pedde as Chairman of the Watts Bar Program Team, (2) R. E. Lewis has been added as the quality assurance team member, (3) the licensing position remains vacant, (4) an additional position has been added for an electrical/instrumentation and control team member, and (5) the description of the program team operation has been revised slightly to better reflect the relation between the team and me.

Further definition and specific detailed program milestones are being developed and these milestones will reflect early NRC review and involvement in the WBN completion process.

Your NRC staff is already participating in the Watts Bar Program Team activities, and I look forward to your continued involvement and review.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

S. A. White, Manager
Office of Nuclear Power

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

MAR 31 1988

cc (Enclosure):
Mr. K. P. Barr, Acting Assistant Director
Regional Inspections
Division of TVA Projects
U.S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Mr. G. G. Zech, Assistant Director
for Projects
Mail Stop 7E23
Division of TVA Projects
Office of Special Projects
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20814

U.S. Nuclear Regulatory Commission
Watts Bar Resident Inspector
P.O. Box 700
Spring City, Tennessee 37381

ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) COMPLETION PROGRAM PLAN

WBN Licensing Strategy

A large number of issues have been identified at WBN through expressed employee concerns, external reviews, and internal examination by TVA. These issues cover a wide range of activities including design, construction, and quality assurance. The identified problems are in some cases programmatic and in some cases issue specific. A number of activities have been undertaken to identify, investigate, and resolve potential problems including: Watts Bar Employee Concern Special Program is reviewing over 5,000 expressed employee concerns; the Weld Project is examining much of the plant welding; a task force was established in 1986 to review potential problems; and other audits and overviews have been conducted. Before completing the Nuclear Performance Plan (Volume 4) for WBN, the Manager of Nuclear Power (ONP) has decided to establish an independent team consisting primarily of TVA employees to assess and make recommendations regarding the adequacy of the existing Watts Bar design and construction. This Watts Bar Program Team (WBPT) will recommend to the Manager of ONP the program required to ensure that WBN meets TVA's licensing commitments and applicable regulatory requirements. The Manager of ONP will review the recommendation and decide on the program to be implemented at WBN. The results of this program will enable TVA to demonstrate to the NRC that WBN is ready to receive an operating license at the conclusion of necessary corrective programs. Additionally, this program will verify that the required programs are in place to govern operational activities.

Watts Bar Program Team (WBPT)

The WBPT has been established and is reporting to the Manager of ONP. This WBPT is developing a recommended overall plan for WBN units 1 and 2 completion. The recommended plan will include guidelines for determining acceptability of work, requirements for reinspection and rework, and methods for evaluation of safety significance of discovered deficiencies. The current WBPT is composed of both TVA employees and contractors with combined experience in design, construction, quality assurance, instrumentation and control, and licensing.

A systematic evaluation of design and construction will be conducted to demonstrate that WBN has been acceptably designed and constructed to meet licensing commitments and applicable regulatory requirements. The WBPT will recommend evaluation activities and will review results. Resources within TVA and contractor organizations will do the actual conduct of the work. The WBPT will request information and documentation from

responsible line organizations to demonstrate adequacy of work performed and closure of corrective action programs. The WBPT will recommend to the Manager of ONP the scope and content for reports to be developed.

The evaluation program will include in its scope the design and construction of safety-related structures, systems, and components and any other areas as directed by the Manager of ONP after reviewing the WBPT's recommendation. Some areas may not require additional evaluation based on a screening of past evaluations.

To determine the level of effort required in each area, the WBPT will develop a matrix of critical design and construction attributes by engineering discipline and by plant system or hardware type. These attributes will be developed based on industry experience and already identified problems at WBN. In addition, criteria will be proposed for acceptance or rejection of each attribute and for the level of examination to be performed. The Manager of ONP will review and approve the matrix and criteria.

Industry Experience

To develop the design and construction attributes, the WBPT will evaluate industry experience by soliciting assistance of industry experts and personnel involved on other domestic nuclear projects.

An industry list of design and construction problem areas will be compiled by the WBPT and provided to the Manager of ONP. It will be used as a checklist for evaluation of WBN. WBN will be examined to determine the applicability of each industry issue at WBN and the results of the examination, recommendations, and support details will be documented. This activity will be coordinated with the overall plan to ensure compliance with licensing commitments.

Overall Plan

Similarly, known problem areas at WBN will be examined by the WBPT to advise whether adequate corrective action programs have been developed and are being executed.

After completing the evaluation of critical attributes, industry issues, and known WBN problem areas, the WBPT will propose to the Manager of ONP a composite corrective action plan for WBN. This recommended plan will, as appropriate, provide for a systematic approach to identify, investigate, and resolve both currently known problems and potential problems identified in the future. The Manager of ONP will review the recommendations and issue a composite corrective action plan. In this way, assurance will be obtained that WBN licensing and industry issues are properly addressed and resolved.

Functions of WBPT

1. General

The WBPT will recommend a program to ensure that licensing commitments and regulatory requirements will be met for WBN startup, to demonstrate this assurance in documented reports, and to manage the certification of the FSAR. A recommended Watts Bar Nuclear Performance Plan, consistent with the TVA Corporate Nuclear Performance Plan, will be developed by the WBPT for approval by the Manager of ONP to guide the efforts for WBN licensing approval.

2. Approach

The WBPT will:

a. Recommend a comprehensive review process including review of issues already identified and review of industry issues that may be applicable at WBN.

b. Propose a documentation process to report on issues including criteria for developing issues.

c. Propose a review program for bounding of issues identified and closure of issues.

d. Propose the documentation and acceptance criteria for closure of issues.

e. Assess the implementation of required actions both hardware and software.

3. Resources

The WBPT initially will consist of six people--the team chairman and five people--each with a different background in engineering, construction, quality assurance, instrumentation and control, or licensing. One of the qualities sought in prospective team members is that their judgment of WBN adequacy not be influenced by prior direct work in TVA WBN quality programs.

The WBPT may draw on any part of the ONP organization, or request that the services of contractors be provided to it, in the conduct of its activities including examinations, inspections, evaluations, and assessments of past work and conduct of corrective actions. Inspection and audit personnel will be trained and certified in accordance with Nuclear Quality Assurance Program requirements.

4. Responsibility

The Manager of ONP has final authority on behalf of TVA, to accept past work and determine requirements for future work at WBN. The WBPT is responsible to the Manager of ONP for the development of a proposed WBN completion program and the recommendation of actions required to assure the licensability of WBN. Corrective action plans will be reviewed by the WBPT and recommendations for closure of corrective actions will be made by the WBPT.

Both WBN units will be covered by this program with the primary focus on unit 1 and the lessons learned from unit 1 to be applied to unit 2 as appropriate. Also, in the event that some issues for unit 2 may be different than for unit 1, these areas may be treated differently for unit 2.

5. Authority

The WBPT reports functionally to the Manager of ONP. Team members report administratively to their respective divisions, (construction, engineering, licensing, and quality assurance). The team will recommend to the Manager of ONP specific work to be conducted by the line organization at WBN for evaluation of potential problems and correction of identified problems. The WBPT will recommend a plan and inform the Manager of ONP whether work has been completed in accordance with the plan. The Site Director will be responsible for implementing the plan as approved by the Manager of ONP.

6. Oversight

Five to eight senior individual, independent advisors will review the program activities periodically and report individually to the Manager of ONP. These individuals will be from outside TVA and will be nationally recognized for their experience with nuclear power programs. Although they meet to discuss their conclusions and recommendations, each shall give his or her conclusions and recommendations independently.

Reports from these advisors will be given to the Manager of ONP for his use in guiding the direction of the WBPT. These oversight advisors will independently judge the completeness of coverage of plant design and construction assurance programs and determine the adequacy of defined corrective action programs to ensure licensability. They will examine the methodology applied to problem identification, root cause analysis, and problem corrections. If investigations are limited in scope, the oversight advisors will independently consider the acceptability of less than full reverification. The oversight advisors will review material prepared by the WBPT, and records of the reviews will be kept by the WBPT including recommendations made by the advisors to the WBPT.

Each oversight advisor will meet regularly with the WBPT to review the WBPT activities. The review by advisors will include methodology, criteria, documentation, and resolution of issues. The oversight advisors will each make recommendations to the WBPT and directly to the Manager of ONP for enhancements to the program.

7. NRC Involvement

TVA will continue to keep NRC informed on the development of this program. NRC interaction will be maintained through the Division of Nuclear Licensing and Regulatory Affairs. It is important that early and frequent involvement of the NRC with the WBPT be achieved in order that TVA programs not get too far ahead of NRC review and that NRC is fully aware of TVA program plans and status.

The WBPT will seek frequent interaction with the NRC to maintain NRC concurrence with the activity of the WBPT. Briefings will be provided to the NRC frequently, and the NRC may opt to participate in meetings conducted by the WBPT. Reports and records prepared for and by the WBPT will be available to NRC.

8. Members of WBPT

The current members of the WBPT have been selected based on their ability to act independent of the existing WBN organization, prior demonstrated management ability to make sound decisions, and specific experience in designated functional areas of engineering, construction, quality assurance, instrumentation and control, and licensing. The team members are:

- Edward D. Fuller	Team Chairman
- P. R. Mandava	Engineering
- Walter V. Horn	Construction
- Robert E. Lewis	Quality Assurance
- Vacant	Instrumentation and Control
- Vacant	Licensing

Resumes for each are included in the attachment.

9. Licensing

The WBPT will consider the following concepts when recommending an overall strategy of how to verify and document that Watts Bar meets TVA commitments and NRC requirements.

a. Existing Special Programs

A number of special programs have been developed to address previously identified problems at WBN. These programs will be independently assessed for adequacy by the WBPT. The WBPT will

review the identified problems, examine the root cause analyses, evaluate the corrective action plans, and make a recommendation regarding the priority for completion of the programs. Results of each special program will be reviewed by the WBPT for a recommendation regarding acceptance before closure and a proposal to incorporate the programs into the overall licensing plan for WBN.

In order to allow currently planned work to continue, the WBPT will review currently planned corrective action programs and make recommendations regarding which work should proceed now and which work should be delayed pending further examination. The Manager of ONP will review and decide the team's recommendation.

b. Vertical Slice

The WBPT will evaluate and make a recommendation regarding the desirability and timing for a vertical slice evaluation of the plant design and construction process.

c. Systematic Evaluation

The WBPT will propose to the Manager of ONP a systematic evaluation program to ensure licensing commitments associated with design, construction, quality assurance, testing, inspection, operation, maintenance, and training have been appropriately implemented. The program will include plans for licensing commitment verification, design basis verification, design review, and construction review. The WBPT will recommend acceptance criteria and functional areas for full verification and verification by sampling. Industry experience and results of existing programs at WBN will be factored into selection of sampling plans.

ATTACHMENT

Resumes for
Watts Bar Program Team Members

E. D. Fuller, Chairman

Walter V. Horn

Robert E. Lewis

P. Rao Mandava

NAME: Edward D. Fuller

SUMMARY: Twenty-seven years in nuclear power plant engineering, licensing, operation, and consulting.

EDUCATION:

B.A., Physics
San Jose State University, 1962
M.S., Nuclear Engineering
Stanford University, 1964

EXPERIENCE:

ASSOCIATED PROJECT ANALYSTS

May 1986 - Present

President and founder

Worked primarily in direct support of TVA in developing and maintaining Nuclear Performance Plans and review of related programs. Also consulted with GPU Nuclear Corporation on TMI-2 Recovery Program and Carolina Power and Light on their Nuclear Safety Review Board.

S. LEVY INCORPORATED

October 1978 - April 1978

Vice President, General Manager, Nuclear Applications Division

Consulted on Braidwood Project on Material Traceability Verification Program and Safety Related Equipment Installation Retrofit Program, on South Texas Project on Licensing Program Assessment, on Clinton Project on Results of Quality Programs for Construction. Consulted with Carolina Power and Light on Corporate Nuclear Safety Review program, served on the Iowa Electric Safety Committee for Duane Arnold, developed the integrated schedule programs for Brunswick Station and Rancho Seco. Served as BWR Users Group Coordinator for EPRI Reactor Analysis Support Package and represented Near-Term Construction Permit Applicants in developing response to TMI Lessons Learned.

GENERAL ELECTRIC COMPANY (GE)

April 1976 - October 1978

Manager BWR Licensing

Responsible for GE licensing support to all domestic BWRs. Included FSAR development, resolution of BWR Generic Issues and resolution of plant-specific licensing issues as requested by BWR plant owners.

April 1972 - April 1976	Manager Proposal Engineering Responsible for engineering development of GE's BWR NSSS and Fuel Product Line offerings including customer unique design features.
April 1970 - April 1972	Nuclear Fuel Specialist Responsible for engineering development of GE's Nuclear Fuel Proposals.
April 1968 - April 1970	Technical Leader Core Management Services Responsible for Core Management Services to GE BWR's world-wide.
June 1966 - April 1968	Supervisor, Engineering Training Program Responsible for recruiting and training all new engineering college graduates for GE's Nuclear Division and supervising Advanced Engineering Courses.
June 1962 - June 1966	Engineering Physicist Worked on conceptual reactor physics design of BWR fuel.
July 1960 - June 1962	Engineering Assistant - Conceptual Fuel Design

PROFESSIONAL AFFILIATIONS:

Professional Engineer, California
Member, American Nuclear Society (ANS)
Twice elected Treasurer of ANS
Past Chairman, Fuel Cycle Division of ANS
Past Vice-Chairman, Power Division of ANS
Past Chairman, Public Policy Committee of ANS
Past Chairman, Professional Divisions Committee of ANS
Twice elected to the Board of Directors of ANS

NAME: Walter V. Horn

SUMMARY: Thirty years of engineering construction experience including field service and project management in the nuclear energy field with emphasis on construction management. Managed A/E projects as senior company representative at project sites, provided technical direction to field engineering staff, and managed both union and non-union personnel up to 1,200 craft workers, 3,500 contractors, and 700 non-manual workers.

EDUCATION: B.S., Civil Engineering
University of California, Berkley

EXPERIENCE:

TENNESSEE VALLEY AUTHORITY

February 1987 - Present: Deputy Modifications Manager, Sequoyah Nuclear Plant

Responsible for assisting the construction management of plant modifications and Sequoyah for the Division of Nuclear Construction.

BECHTEL CORPORATION

December 1985 - February 1987: Site Manager, Hope Creek and Salem Nuclear Generating Stations, Hancocks Bridge, New Jersey

Closed out construction completion work and managed operating plant support services including maintenance, plant betterment, and site support.

March 1984 - December 1985: Site Manager, Washington Nuclear Project, Unit 2 Richland, Washington

Closed out construction completion work and managed operating plant support services including maintenance, plant betterment, and site support.

September 1983 - March 1984: Construction Manager/Operating Plant Services, San Francisco, California

Coordinated field services support for operating plant services, staff management and training, and proposal work for various recirculating pipe change-out and operating plant services projects.

July 1982 - September 1983	Project Manager, San Clemente, California Responsible for San Onofre unit 1 Retrofit Project including design/project engineering, procurement, and construction. Brought plant up to present day seismic standards.
August 1981 - July 1982	Project Superintendent, Washington Nuclear Project units 1 and 4, Richland, Washington Coordinated field activities of 45 contractors. Supervised shifting of project to a holding status.
April 1969 - August 1981	Field Construction Manager, Arkansas Nuclear One, units 1 and 2, Russellville, Arkansas Functioned in increasingly responsible positions, starting as Lead Civil Engineer, became Field Construction Manager responsible for all construction activities through project completion and startup, and established and managed operating plant services for 2-unit generating station.

GENERAL DYNAMICS

July 1986 - April 1969	Associate Staff Member Responsible for project schedule control of Ft. St. Vrain and 1,000 MW HTGR development program.

BECHTEL CORPORATION

1957 - 1966	Field Engineer/Senior Field Engineer Increasingly responsible positions at Canadian and U.S. sites.
PROFESSIONAL AFFILIATIONS:	Member, American Society of Civil Engineers Registered Civil Engineer, California

NAME: Robert E. Lewis, Jr.

SUMMARY: Twenty years of engineering experience in research and development, design, construction, maintenance, and operation of various power and industrial facilities. This includes fifteen years of experience in the nuclear power industry, principally in the area of quality assurance management and consulting.

EDUCATION: B.S., Mechanical Engineering, Drexel University, 1968
Graduate study, Business Administration, University of Hawaii, 1973

EXPERIENCE: GILBERT/COMMONWEALTH, INC.

1987 - present — Manager, Quality Assurance Service Development

Guide and direct the development of new, innovative applications for quality management and quality assurance in various industries. Provided consulting in quality assurance and quality management to various clients including applications in laboratory experimental work in the nuclear industry and in the chemical processing industry.

1983 - 1987 — Manager, Division Program Management

Direct QA program management activities for projects in the U.S. as well as overall direction of QA activities in international offices and projects. Direct Internal Corporate QA activities and QA Division Contract and Administrative services. Assist in the development of new service areas and the marketing of all Quality Assurance Division services.

1982 - 1983 — Manager of Programs

Responsible for QA program management activities for several projects. Maintained communications with client management to assure that services provided were satisfying client expectations. Provided consulting services to clients in areas related to quality assurance. Assessed and evaluated the effectiveness of quality assurance programs over which G/C QAD had cognizance.

Robert E. Lewis

1979 - 1982

Senior Quality Assurance Program Manager

Guide and direct QA program management activities for several projects. Directed preparation of project schedules and budgets and coordinated efforts for staffing to meet project requirements. Performed liaison with clients and other GAI project organizations to assure the effective operation of quality assurance programs.

1975 - 1979

Quality Assurance Program Manager

Responsible for the development and organization of a foreign utility's nuclear quality assurance program including planning and directing the quality assurance program performed by personnel at the utility's headquarters and the project construction site. Responsibilities included liaison and coordination with architect/ engineers, NSSS suppliers, construction management, vendors and contractors, and supporting utility's interface with the National Regulatory Agency and the International Atomic Energy Agency.

1973 - 1975

Quality Assurance Mechanical Engineer

Responsible for mechanical engineering assignments in the execution of quality assurance programs for nuclear power and fossil fuel generating stations. Assignments included reviewing specifications, vendor's proposals, quality assurance manuals, and related manufacturing test and inspection procedures. Also responsible for reviewing procurement documents and site construction and quality control procedures, performing vendor evaluation surveys, inspecting vendor equipment, and providing liaison with site inspectors to resolve vendor and site problems.

1970 - 1973

STANDARD OIL COMPANY OF CALIFORNIA
HAWAIIAN REFINERY, BARBERS POINT, HAWAII

Refinery Engineer

Plant engineer for operating refinery. Responsible for condition monitoring for all

refinery equipment and subsequently making recommendations for maintenance and repair work.

Also developed feasibility studies and cost estimates for new and replacement equipment including estimates for a complete Crude Distillation Unit. Performed studies to control refinery corrosion including use of cathodic protection on pipelines and tanks.

1968 - 1970

U.S. NAVAL SHIPYARD, NUCLEAR POWER DIVISION
PEARL HARBOR, HAWAII

Nuclear Engineer

Prepared engineering documents for performing modification work on nuclear reactor plant systems for submarines. Prepared bills of materials, manufacturing and inspection procedures. Resolved discrepancies found in purchased equipment and shipyard workmanship.

1967 - 1968

SELAS CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Research Engineer

Research and development in applications of heat transfer theory to practical furnace and burner design. Application of digital computer programs to design of furnaces fired by gas and oil burners.

1964 - 1967

Research Technician

Assisted in design of experimental furnaces and burners. Set up experiments for study of flame properties. Programmed digital and analog computers for solution of heat transfer problems in industrial furnace applications.

PROFESSIONAL AFFILIATIONS:

Professional Engineer - Hawaii (1970) and Pennsylvania (1974)
American Society of Mechanical Engineers
American Society of Quality Control

NAME: P. Rao Mandava

SUMMARY: Seventeen years of project management, design, and licensing of nuclear power plants. Engineering analysis and design, specifications, field engineering resolutions, planning, cost control, configuration management, safety analysis reports, application of codes and standards, and coordination with regulatory authorities.

EDUCATION:

B.S., Mechanical Engineering, Government College of Engineering, Kakinada, India, 1964
M.S. Mechanical Engineering, Oklahoma State University, 1966

EXPERIENCE:

TENNESSEE VALLEY AUTHORITY

July 1987 - Present

Engineering Manager, Watts Bar and Bellefonte Nuclear Plants, Division of Nuclear Engineering (DNE)

DNE Management sponsor for project engineering at Watts Bar and Bellefonte. Responsible for interdivisional and DNE coordination in support of project engineering and for providing guidelines, priorities, and methodologies in accomplishing project engineering function.

WESTINGHOUSE ELECTRIC CORPORATION

September 1986 - July 1986

TVA Licensing Support Manager, Nuclear Safety Department, Knoxville

Responsible for management coordination of all nuclear safety-related activities in support of achieving TVA's licensing objectives. The primary objective is to assist TVA in an optimum manner in addressing their schedules and efforts to restart their nuclear program.

March 1986 - August 1986

Project Manager - Standard U.S. two-loop turnkey nuclear plant project, Pittsburgh, Pennsylvania

Responsible for a study that produced a cost effective, up-to-date and efficient standard two-loop turnkey power plant that is licensable in the U.S. under the current NRC regulations. Project included upgrading reference design, licensability review with the NRC, including a one-step licensing methodology, constructability review, and total plant costing with extremely high accuracy.

June 1980 - March 1986

Project Engineering Manager, Phillipine Nuclear Power Plant

Overall management of engineering and licensing of the turnkey power plant. Directed Westinghouse engineering and licensing personnel and the Architect/Engineer. Responsible for planning and execution of NSSS and BOP detail design, budget control, design assurance and constructability reviews, vendor coordination, field problem resolution, preparation of safety analysis reports, and licensing defense. Familiar with up to date regulatory requirements, codes and standards, and safety and risk analysis techniques.

January 1977 - June 1980

Engineering Manager, Angra Nuclear Power Plant

Responsible for managing the engineering and licensing functions. Located at the job site, assisting construction, startup, and quality assurance closely. Interacted extensively with the customer and the regulatory agency in licensing defense.

October 1974 - January 1977

Senior Project Engineer, Power Plant Projects

Was responsible for mechanical engineering discipline of nuclear power plant projects. Design assurance, detail design, specifications, preparation of safety analysis reports, licensing support, and resolution of technical and construction problems were the responsibilities.

BECHTEL CORPORATION

April 1971 - October 1974

Engineering Supervisor, Ann Arbor, Michigan

Responsible for the design of mechanical systems, preparation of safety analysis reports, interaction with NRC with regard to licensing of Turkey Point, Calvert Cliffs, and Greenwood 2 and 3 nuclear power plants, piping and hanger design, stress analysis, design of fire protection, HVAC, stedam, feedwater and cooling water systems were some of the specific responsibilities.

BOEING COMPANY

July 1966 - April 1971

Research Engineer/Structural Analyst, Seattle, Washington

Responsible for design of supersonic transport structures. Applications of sophisticated computer programs, including finite element analysis, mockup and testing of structures, stress analysis and reliability evaluations were also the responsibilities.

TRW, INC.

January 1966 - July 1966

Process Engineer, Cleveland, Ohio

Process selection, design, and manufacturing techniques related to automotive engine components.

PROFESSIONAL AFFILIATIONS:

Professional Engineer, Washington State, Pennsylvania, Maryland, and Illinois
Member of ASME