

BROWNS FERRY NUCLEAR PLANT
SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI) PLAN

NUCLEAR QUALITY AUDIT AND EVALUATION BRANCH
DIVISION OF NUCLEAR QUALITY ASSURANCE

SPECIAL INSPECTION NUMBER
BFA88811

Prepared by *T E Bredette* Date 6-10-88
Chief, Quality Audit and Evaluation Branch

Approved by *W E Anderson Jr* Date 6/10/88
Director, Division of Nuclear Quality Assurance

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BROWNS FERRY NUCLEAR PLANT (BFN)
SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI) PLAN
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I

INTRODUCTION

INTRODUCTION

This safety system functional inspection (SSFI) is being performed as part of the overall restart technical verification program for Browns Ferry Nuclear Plant (BFN). Results from this inspection will be used by TVA to provide confidence in the functional readiness and control programs at BFN for restart.

The SSFI is being conducted under the Division of Nuclear Quality Assurance, Nuclear Quality Audit and Evaluation Branch (DNQA/NQA&EB) audit program with technical assistance from Energy Resources Management Company, Inc., (ERCI). This provides the required independence necessary for such an activity.

The SSFI will also be used to improve TVA's system engineering, auditing, and monitoring techniques.

This plan includes the administrative controls for this inspection and details on the inspection plan, team organization, and qualifications of the team members for the BFN SSFI.

II

INSPECTION NOTIFICATION

Memorandum

R 89 880523 845
TENNESSEE VALLEY AUTHORITY

TO : H. P. Pomrehn, Site Director, Browns Ferry Nuclear Plant

FROM : T. E. Burdette, Chief, Nuclear Quality Audit and Evaluation Branch,
LP 4M 65E-C

DATE : MAY 23 1988

SUBJECT: NUCLEAR QUALITY AUDIT AND EVALUATION BRANCH SPECIAL INSPECTION
NOTIFICATION - INSPECTION NO. BF88811 - EHR SERVICE WATER SYSTEM -
SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI) (99)

PURPOSE

The purpose of this memorandum is to confirm that performance of the subject safety system functional inspection (SSFI) has been scheduled for Browns Ferry Nuclear Plant the week of June 6-July 1, 1988.

BACKGROUND

This special inspection has been requested by corporate TVA management and presented to NRC as part of the overall restart technical verification program. This SSFI is being performed by the Nuclear Quality Audit and Evaluation Branch with technical assistance from Energy Resources Management Company, Inc., (ERCI). The inspection will address those areas identified on the attached inspection schedule and scope document. Team members will arrive at Browns Ferry on May 23-27, 1988, for (GET) training and plant familiarization. This has been coordinated between W. A. Conley (BFN) and C. T. Dexter (BFN). This inspection was coordinated between B. W. Garner, of the Plant Operations Review Staff, and R. W. Duncan, of NQA&EB, on May 16.

ACTIONS

A preexit conference is scheduled for June 6 at 10 a. m., in the Plant Assembly Room and a postexit conference is tentatively scheduled for July 1. We will need a representative from your organization with experience in electrical design, mechanical design, testing, maintenance, modifications, instrumentation/controls, and operations, to act as counterparts to team members as shown on attached schedule and scope. The inspection team will need the representatives on normal work hours only. The team leader will brief the plant manager and appropriate personnel on a daily basis as desired by management. Please make the necessary provisions for adequate working space and assure availability of cognizant personnel.

RESPONSE

No response to this memorandum is necessary. If you have any questions or concerns with the inspection scope or schedule, please call me or Ron Duncan at your earliest convenience.

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H. P. Pomrehn

NUCLEAR QUALITY AUDIT AND EVALUATION BRANCH SPECIAL INSPECTION
NOTIFICATION - INSPECTION NO. BFAS8811 - RHR SERVICE WATER SYSTEM -
SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI)

cc (Attachment):

RIMS, MR 4W 72A-C
W. E. Andrews, LP 4W 50A-C
J. T. Barnes, DNQA, PS Bldg., Browns Ferry
W. A. Conley, PSB K, Browns Ferry
J. E. Daniel, PORS, Browns Ferry
R. D. Erickson, Browns Ferry
W. H. Hannum, BR 1W 77B-C
W. C. Kazanas, LP 4W 45A-C
R. F. McCraney, DNQA, PS Bldg., Browns Ferry
W. A. Pruett, LP 4W 113E-C
F. W. Tanner, DNE, 5-132.SB-K
G. G. Turner, Browns Ferry
J. G. Walker, Browns Ferry
Audit Working Files

0388R

DIVISION OF NUCLEAR QUALITY ASSURANCE
INSPECTION SCHEDULE AND SCOPE

Inspection Subject and Module No (s) RESIDUAL HEAT REMOVAL (RHR) SERVICE WATER
SYSTEM, UNIT 2 (SAFETY SYSTEM FUNCTIONAL INSPECTION)(99)

Inspection Number: BFA88811 Scheduled Dates: June 6 - July 1, 1988
Actual on site dates:
June 6-10; June 20 - July 1

Location and Organization: BROWNS FERRY NUCLEAR PLANT (OPERATIONS)

T. E. Burdette (SSFI) Task Mgr.
W. A. Conley, Asst. Task Mgr.

Source References:
See page 2 of 2

(**Team Leader) (*Technical Specialist)
**G. J. Overbeck (ERCI)
*J. J. Betti (ERCI) Operations
*W. R. Boyd (ERCI) Testing
*S. M. Klein (ERCI) Mech. Design
*S. F. Kobylarz (ERCI) Elec. Dsgn.
*W. C. Sherbin (ERCI) Maint/Mod.
F. W. Tanner, Instrument/Controls
J. L. Thompson, Mgmt. Systems

(Technology Transfer)
W. A. Pruett, Asst.

R. F. McGraney

Inspection Scope

Safety System Functional Inspection (99)

This inspection is to be conducted in a manner with SSFI methodology as described by the NRC Inspection and Enforcement Manual, Chapter 2515, Appendix C, and is to be a performance based evaluation of the operational readiness of selected safety systems to function under analyzed accident conditions. The residual heat removal service water system, as described in the TVA Browns Ferry FSAR Section 10.9-1, was selected for review with additional attention to interface with supporting and serviced systems.

The inspection shall evaluate the operational readiness of selected safety systems by determining through observation and appropriate reviews whether:

1. The systems are capable of performing the safety functions required by their design basis.
2. Testing is adequate to demonstrate that the system would perform all of the safety functions required.

Safety System Functional Inspection (Continued)

3. Systems maintenance (with emphasis on pumps and valves) is adequate to ensure system operability under postulated accident conditions.
4. Operator and maintenance testing is adequate to ensure proper operation and maintenance of the systems.
5. Human factors considerations relating to the selected systems (e.g., accessibility and labeling of valves) and the support procedures for those systems are adequate to ensure proper system operation under normal and accident conditions.
6. Management controls including procedures are adequate to ensure that the safety systems will fulfill the safety functions required by their design basis.

In addition, a sampling of findings from the Sequoyah Integrated Design Inspection (IDI) of essential raw cooling water (ERCW) will be performed to ensure that corrective actions have been addressed, as appropriate, at Browns Ferry for the (RHR) service water system.

Controlling Documents (Operations)

10 CFR 50

Final Safety Analysis Report

Technical Specifications

Nuclear Quality Assurance Manual (NQAM)

Program Manual Procedure (PMP)

U. S. Nuclear Regulatory Commission Inspection and Enforcement Manual,
Chapter 2515, Appendix C, "Safety System Functional Inspection".

Appropriate Nuclear Performance Plan Commitments, Vol. III

Concurred by:

Sam J. O'Neil
SSFI Team Leader

Concurred by:

G. J. Barnes
Audit Group Manager

Approved by:

R. Boudette
SSFI Task Manager
Chief, NQA & EB

III

BFB SITE PARTICIPATING ORGANIZATIONS

Memorandum

834 33002 377
TENNESSEE VALLEY AUTHORITY

: The Safety System Functional Inspection Team and the Participating Browns Ferry Nuclear Plant Site Personnel, Browns Ferry Nuclear Plant

FROM : H. P. Pomrehn, Site Director, PAB E, Browns Ferry Nuclear Plant

DATE : JUN 03 1988

SUBJECT: BROWNS FERRY NUCLEAR PLANT (BFN) - NUCLEAR QUALITY AUDIT AND EVALUATION BRANCH SPECIAL INSPECTION NUMBER BFA88811 - RESIDUAL HEAT REMOVAL (RHR) SERVICE WATER SYSTEM - SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI) 99

PURPOSE

The purpose of this memorandum is to emphasize the importance of the SSFI scheduled for BFN from June 6, 1988 to July 1, 1988, and to identify participating site personnel.

BACKGROUND

This special inspection has been presented to NRC as part of the overall BFN restart technical verification program. The inspection will consist of an intensive look at the RHR service water system, emergency equipment cooling water system, and support systems. Many questions will be generated by the team, and there will be a need for experienced individuals as site counterparts to answer or obtain answers to these questions. Additional technical support will be assigned, as needed, to support the counterparts. The counterparts assigned to the SSFI team leader will be responsible for informing management daily of team concerns and for the need of additional technical support.

ACTIONS

1. Provide representatives to function as counterparts to team members as shown on attachment 1. Counterparts will be needed during normal work hours with the possible exception of Saturday, June 25, 1988. This will be a full-time assignment, so assure availability of cognizant personnel.
2. SSFI contacts are assigned in accordance with attachment 2. Provide alternate names and contacts if primary contacts will not be available.
3. Counterparts should be made aware of duties and responsibilities in accordance with attachment 3.

The Safety System Functional Inspection Team and the Participating
Browns Ferry Nuclear Plant Site Personnel, Browns Ferry Nuclear
Plant

JUN 03 1988

BROWNS FERRY NUCLEAR PLANT (BFN) - NUCLEAR QUALITY AUDIT AND
EVALUATION BRANCH SPECIAL INSPECTION NUMBER BF88811 - RESIDUAL HEAT
REMOVAL (RHR) SERVICE WATER SYSTEM - SAFETY SYSTEM FUNCTIONAL
INSPECTION (SSFI) 99

RESPONSE

No written response to this memorandum is necessary. If you have
any questions or concerns with the inspection schedule, please call
John Stapleton at extension 2913, or W. A. Conley at extension 3045.


H. P. Pomrenn

GGT:WAC:WAP:LJH

Attachments

cc (Attachments):

RIMS, MR 4N 72A-C

N. C. Kazanas, LP 4N 45A-C

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ATTACHMENT 1

SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI)
RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM

<u>SSFI TEAM</u>	<u>COUNTERPART</u>	<u>TELEPHONE EXTENSION</u>	<u>TECHNOLOGY TRANSFER</u>
T. E. Burdette (SSFI) Task Manager, (Chief, Nuclear Quality Audit and Evaluation Branch (NQA&EB)	John P. Stapleton (Advisor)	2918	
W. A. Conley, Assistant Task Manager (Quality Improvement)			
• Gary Overbeck (Team Leader)	John Sparks (Systems Engineering) Mostafa Dayani (Systems Engineering)	2493	W. A. Pruett, (NQA&EB)
• Randall Boyd (Testing)	Larry Holloway (Systems Engineering)	2020	M. S. Thacker, (Quality Surveillance)
• Bill Sherbin (Maintenance)	Gary McConnell (Maintenance)	3159	L. S. Clardy, (Quality Surveillance)
• Bill Sherbin (Modifications)	Jim Serafin (Modifications)	2097	R. F. McCraney (NQA&EB)
• Stan Kobylarz (Electrical Design)	Randall McIntosh (Electrical Design- Knoxville)	8368-K	
• Stuart Klein (Mechanical Design)	George Askew (Mechanical Design- Knoxville)	2492-K	
• John Betti (Operations)	Terry Chinn (Operations)	2552	
Frank Tanner (Instrumentation and Control [I & C] Engineers)	Charlie Brush/Design (I & C Knoxville) George Chambers (I & C)	2708-K 3134	
James Thompson (Management Systems) Quality Surveillance			
• ERC International Technical Specialists			

NOTE: SSFI team primary location will be in the Training and Visitor Center,
room 229, extension 3412.

ATTACHMENT 2

PLANT SAFETY SYSTEM FUNCTIONAL INSPECTION CONTACTS

<u>SECTION</u>	<u>NAME</u>	<u>TELEPHONE EXTENSION</u>
Engineering and Technical Training	Gerald Moody	3958
Operations Training	Ardie R. Champion	3437
Drawing Control	Norman Batts	5565
Licensing	Mike May	3570
Document Control	Jacque Nelson	3654
Procurement Quality Assurance Branch	Bobby Habbe Max Conner	4969-K 2440-K
Building Services	Jim Green	3835
Materials	Iven Holt	3814
Plant Operations Review Staff	Barbara Garner	2539
Operating Experience Review	Elizabeth Balch	2860
Planning and Scheduling	Ed Cornelius	3330
Workplans/Engineering Change Notices	Pat Crabb	2706
Conditions Adverse to Quality Reports	E. Doris Charlton	3044
Engineering Assurance	John Walton	5604

ATTACHMENT 3

Duties and Responsibilities of Counterparts

- Answer or assist in answering Safety System Function Inspection team questions.
- Record and provide Quality Assurance significant questions for tracking. Use forms provided.
- Maintain open communications with other counterparts for concerns in their areas that might be applicable to your area.
- Inform Browns Ferry Nuclear Plant (BFN) management of team concerns.
- Identify Conditions Adverse to Quality Reports where applicable.
- Critique your effort as well as the teams. Remember - we are doing this for our own benefit as part of the BFN restart technical verification program to assure system functionality and to identify anything that could adversely affect the system.

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IV

INSPECTION PLAN

these requirements into appropriate maintenance procedures and periodic maintenance test schedules as necessary.

8.4 Supplementary Reviews

- 8.4.1 Review maintenance work requests, maintenance drawings, and maintenance records to determine whether required maintenance was properly executed as specified in maintenance procedures.
- 8.4.2 Review maintenance records to confirm that required post-maintenance testing was conducted as specified in maintenance test procedures and that the test adequately demonstrated that the system and components tested will perform their intended safety functions as defined in the design bases.
- 8.4.3 Review maintenance records to determine whether repeated maintenance problems with the same components are adequately tracked and the root cause of the problems resolved. Review failure trending programs.
- 8.4.4 Review program for conducting maintenance and testing on motor operated valves (MOV) in the RHRSW and EECW systems. Review procedures and methods used for torque switch, torque switch bypass, and limit switch settings. Confirm that settings are made in accordance with manufacturer's recommended settings and procedures. Review maintenance records to assure that the vendor-recommended lubrication schedules and lubricants are implemented and that proper lubrication procedures are used. Review Nuclear Safety Review Board (NSRB) records of valves with high problem rates.
- 8.4.5 Review post-maintenance test procedures for MOVs to determine whether testing is done at design differential pressure. Confirm that specified differential pressures are consistent with documented worst conditions and accident scenarios.
- 8.4.6 Determine whether trend analysis of oil leakage and oil additions is performed for pumps to prevent pump failure.
- 8.4.7 Coordinate with EA, ORT's review of corrective and preventive maintenance on the EECW and core spray systems.

9.0 Management

9.1 Initial Review

- 9.1.1 Identify training procedures and documentation, including operator training and training associated with design changes, to be reviewed in detail.
- 9.1.2 Select modifications to be reviewed to identify any effects on training of operations personnel resulting from modifications to the design of RHRSW and EECW and interfacing systems.

9.1.3 Select modifications to be reviewed to identify weaknesses in configuration control.

9.2 Detailed Review

9.2.1 Review operator training procedures to identify weaknesses which may be associated with inaccuracies in the procedure details relative to design basis documents and actual RHRSW and EECW system functions.

9.2.2 Review modifications selected to assure that provisions have been made to revise operator training procedures and documentation which may be affected by changes to the RHRSW and EECW design.

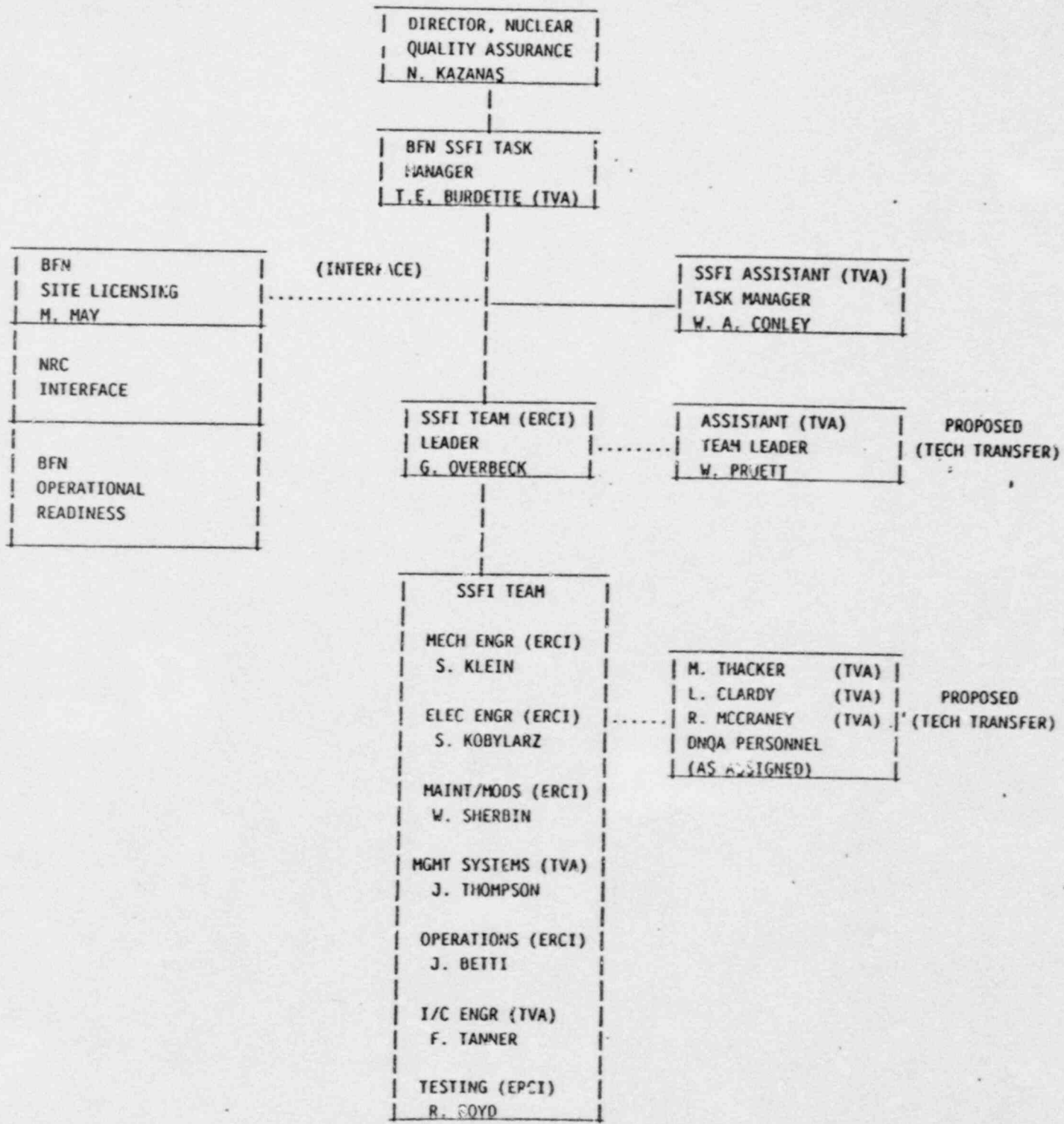
9.2.3 Review modifications to confirm that changes made to the RHRSW and EECW and interfacing system have been accurately reflected in timely revisions to the FSAR, drawings, operating and maintenance procedures, calculations, technical specifications, Q-List, and training documents where required. Evaluate errors and inconsistencies identified, including those identified by other reviewers, to determine if a generic weakness exists.

9.2.4 Confirm that training of maintenance personnel in the implementation of maintenance procedures is adequate to assure the successful and correct performance of maintenance activities on safety-related equipment. Review methods used to train personnel in the proper setting of motor operated valve torque switches, torque switch bypasses, and limit switches.

9.2.5 Review the procedures for temporary alterations (TAGPs).

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THE SSFI ORGANIZATION AND TEAM



SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI) TEAM
BROWNS FERRY NUCLEAR PLANT JUNE 6 - JULY 1, 1988

<u>SSFI TEAM</u>	<u>RESPONSIBILITY</u>	<u>EDUCATION/TRAINING</u>	<u>EXPERIENCE</u>	<u>BACKGROUND</u>
+T. E. BURDETTE	TASK MANAGER	B.S. INDUSTRIAL ENGINEERING NRC INSPECTOR TRAINING	20 YEARS NUCLEAR	ENG., NRC, QA
+W. A. CONLEY	ASST. TASK MGR.	LICENSED OPERATOR (SRO)	22 YEARS NUCLEAR/ FOSSIL	OPS, QA
*G. J. OVERBECK	TEAM LEADER	U. S. NAVAL ACADEMY	18 YEARS NUCLEAR	ENG., NUCLEAR DESIGN, CONST. & OPS
*W. R. BOYD	TESTING	B. S. MECHANICAL ENGINEERING	7 YEARS NUCLEAR	ENG., OPS, TESTING, MAINT
*J. J. BETTI	OPERATIONS	LICENSED OPERATOR (SRO)	20 YEARS NUCLEAR/ FOSSIL	OPS
*S. M. KLEIN	MECH. DESIGN	B. S. MECHANICAL ENGINEERING	25 YEARS NUCLEAR/ AVIATION	ENGINEERING, MECH. DESIGN DESIGN REVIEW
*S. F. KOBYLARZ	ELECTRICAL DESIGN	B. S. ELECTRICAL ENGINEERING	14 YEARS NUCLEAR	ENG. ELEC. DESIGN, DESIGN REVIEW
*W. C. SHERBIN	MAINT/MODS	M. S. MECHANICAL ENGINEERING	17 YEARS NUCLEAR POWER SYSTEMS	ENG. MECH DESIGN, MAINT.
+F. W. TANNER	I & C	M. S. MECHANICAL ENGINEERING	17 YEARS NUCLEAR	ENG., I & C DESIGN
+J. L. THOMPSON	MGMT. SYSTEMS	LICENSED OPERATOR TRAINING	11 YEARS NUCLEAR	OPS, QA

+ - TVA

* - ERCI

VI

RESUMES

THOMAS E. BURDETTE

Chief, Quality Audit and Evaluation Branch

EDUCATION

B. S., Industrial Engineering from Virginia Polytechnic Institute and State University, 1968
NRC Resident Inspector Training
Shift Refueling Engineer Training
Reactor Plant Engineer Course
Numerous Management Development Courses
Top Performer Program

PROFESSIONAL AFFILIATIONS

American Society for Quality Control (ASQC)
ASQC Quality Surveillance Subcommittee

SUMMARY OF QUALIFICATIONS

Mr. Burdette has over 20 years of experience in various supervisory, engineering and technical positions in the nuclear industry.

PROFESSIONAL EXPERIENCE

TVA

Mr. Burdette is currently serving as Chief, Quality Audit and Evaluation Branch. In this position, he is responsible for the TVA audit program for operation and construction at TVA sites.

As staff assistant in the manager's office, I was the first candidate in the newly established "Top Performer Program". My duties and assignments were delegated by the Deputy Manager and varied from special tasks in the corrective action program to various reports and presentations on TVA's plans and programs for startup of the nuclear plant.

As manager of the Quality Surveillance Programs Group, my responsibilities were to develop policies, plans, and guidelines for the surveillance program for construction and operations at four nuclear plant sites. The group is also responsible for the Training and Qualification Program for surveillance personnel.

With the Clinch River Breeder Reactor Project in Oak Ridge, Tennessee, I was Chief of the Quality Verification Branch, responsible for surveillance and audit of Quality Assurance Programs of major project participants. Previously, I was Chief of the Quality Improvement Branch, responsible for Nonconformance Control and Disposition, and the Project Training and Indoctrination Activities.

THOMAS E. BURDETTE

NRC

With the Nuclear Regulatory Commission in the Atlanta Region II office, I was a Project Engineer in the Construction Branch. Responsibilities were for the construction inspections of the Summer Nuclear Plant near Columbia, South Carolina, the St. Lucie Nuclear Plant near Ft. Pierce, Florida and the Hartsville Nuclear Plant near Nashville, Tennessee. I was selected and qualified to be the Senior Resident Inspector at the Phipps Bend Nuclear Plant.

DEPARTMENT OF NAVY

With the Department of Navy Supervisor of Shipbuilding Office in Pascagoula, Mississippi, I was manager of the Nuclear Quality Assurance Division responsible for the review of the contractor's Nuclear Quality Program and monitoring the contractor for compliance with contract specifications. This entailed inspection and audit of all facets of the shipbuilding program related to the reactor plant from material procurement through construction testing, operational testing, and including sea trials.

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WILLIAM A. CONLEY

Quality Analyst

EDUCATION

High School - GED
U.S. Navy Electricians Class A School
TVA, Generating Plant Operators School
TVA, BFN Basic Nuclear
TVA, BFN BWR Nuclear Technology
General Electric BWR SIMULATOR
Oak Ridge National Laboratories Small Reactor Training
TVA, Electrical Switchboard Training
TVA, BLN, PWR Technology Training
UTC, Thermodynamics and Fluid Transfer

PROFESSIONAL AFFILIATIONS

n/a

SUMMARY OF QUALIFICATIONS

Mr. Conley has over 21 years of experience in the commercial nuclear power industry. Eighteen of these years are in operations (Licensed SRO) and three years are in quality assurance.

PROFESSIONAL EXPERIENCE

TVA

In Mr. Conley's present position as Quality Analyst with BFN Quality Improvement Section, he is responsible for identifying, assessing status, adequacy, and effectiveness of site programs. He develops and implements programs for maintaining site quality performance indicators.

As a Quality Specialist in TVA's Quality Audit Branch, Mr. Conley was responsible for assisting as an auditor in various audits at TVA's Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants in accordance with plant technical specifications and TVA's Topical Report.

Mr. Conley worked as temporary Assistant Operations Supervisor at Bellefonte Nuclear Plant. He was responsible for day-to-day operations of the plant, operators training, budget preparations, and operational support of construction activities.

WILLIAM A. CONLEY

TVA

Mr. Conley worked as the Nuclear Power and Workplan Coordinator at Bellefonte Nuclear Plant. He was responsible for the coordination of construction activities with the plant for initial operation of equipment, flushing, testing, and preop testing.

Mr. Conley worked as the Unit Operator, Assistant Shift Engineer, and Shift Engineer at TVA, BFN. He was responsible for unit and plant operations during his shift and from preop testing to commercial operation of units 1, 2, and 3. He was one of the original 23 of TVA's first operators to be licensed by the AEC and NRC.

As outage coordinator during BFN's first unit 2 refueling outage, he was responsible for coordinating outage activities with the Operations Section.

As Assistant Unit Operator at TVA's Paradise Steam Plant, he was responsible for preop test to commercial operations of unit 3. He was responsible for the operations of unit equipment.

GARY J. OVERBECK

Chief Mechanical Engineer

EDUCATION

Certificate, Graduate Level Course in Nuclear Reactor Theory & Operation, 1971
B.S., U.S. Naval Academy, 1969

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer (Nuclear), Commonwealth of Pennsylvania and State of Washington
American Nuclear Society

SUMMARY OF QUALIFICATIONS

Mr. Overbeck has 18 years of nuclear engineering experience of which the last 12 years have been in the design, construction, and operation of commercial nuclear power plants. For four years, Mr. Overbeck has participated in OIE's QA Inspection Programs as a member of Integrated Design Inspections (IDI), Construction Assessment teams (CAT), Safety System Functional Inspections (SSFI), Safety System Outage Modification Inspections (SSOMI), and as a principal reviewer of Independent Design Verification Programs (IDVP). In addition, Mr. Overbeck has extensive personal expertise in all facets of commercial and naval nuclear power plants, with particular emphasis on technical aspects, nuclear project management, computer software development and use in nuclear applications, configuration management, and reactor licensing. He is an experienced professional who has operated nuclear reactors, designed commercial nuclear plants, and assisted both the NRC and nuclear utilities in determining the adequacy of current design or proposed modifications.

PROFESSIONAL EXPERIENCE

WESTEC Services, Inc.

1980 to present

Mr. Overbeck serves as project manager and chief mechanical engineer. Over the last four years he has participated as a member of the Integrated Design Inspection team on Byron, River Bend, Perry, and Shearon Harris; of the Construction Assessment Team on Waterford; of the Independent Design Verification Program review team for Limerick and Clinton; of the Safety System Functional Inspection (SSFI) team at Turkey Point, ANO, Pilgrim, Palisades, TMI, Trojan, Oconee, Rancho Seco, D.C. Cook and Crystal River; and the Safety System Outage Modification Inspection (SSOMI) team at Dresden, Fort Calhoun, and Indian Point 3. In this effort he has been a discipline leader in the mechanical, nuclear design area and responsible for the development and implementation of inspection plans. In successfully completing these seven inspections/reviews, Mr. Overbeck has demonstrated a working familiarity with the regulatory requirements, consensus codes and standards, and of quality assurance requirements. During these inspections Mr. Overbeck was required to assess project management's capability to ensure a quality design. He has also performed assessments of technical audits performed by middle level management (chief engineer or equivalent) of major architect engineering organizations to establish their contribution

GARY J. OVERBECK

to ensuring a quality design. Mr. Overbeck has demonstrated his diverse knowledge of the nuclear field by conducting in-depth technical reviews of such topics such as high energy line breaks, fire protection, interaction of non-seismic equipment on safety-related equipment, water hammer, classification of safety components, and equipment qualification. Mr. Overbeck is also a project manager responsible for the preparation of design modification of a containment polar crane at Point Beach Units 1 & 2 for Wisconsin Electric Power Company. For Niagara Mohawk Power Company's Nine Mile Point Unit 1, he completed a detail review of systems required to mitigate the consequences of an HELB or LOCA, documented system safety functions, and identified the electrical equipment required to support those functions. Mr. Overbeck has participated as a senior reviewer and task leader in various aspects of WESTEC's activities supporting the U.S. Nuclear Regulatory Commission's Systematic Evaluation Program. In this capacity, he provided overall plant system knowledge and an understanding of system safety function. In addition, he has participated in the evaluation of nuclear licensing submittals involving current plant designs and dealing with the following subjects: auxiliary feedwater automatic initiation and indication, control of heavy loads, containment leak testing, reactor coolant system pressure isolation, bypass and override features of containment purge and engineered safety feature systems, and reliability of primary relief valves.

United Engineers & Constructors, Inc.

1974 - 1980

Supervising Mechanical/Nuclear Engineer. He supervised 10 engineers and 22 designers, and was responsible for all engineering, design and procurement of systems and components to support a Babcock and Wilcox 205 FA pressurized water reactor coupled to a Westinghouse turbine. Mr. Overbeck also supervised the preparation of the Final Safety Analysis Report and associated licensing activities, which included an extensive review of the Three Mile Island accident with respect to the plant design. He was responsible for the review and implementation of the NRC Staff's Lessons Learned and industry's TMI-2 recommendation. Mr. Overbeck assisted in the formulation of the owner's response to the NRC's request for additional information concerning the sensitivity of the B&W once through steam generator design to overcooling transients.

Final Safety Analyst Coordinator. Mr. Overbeck was assigned as the responsible engineer for coordination and direction of nuclear engineers in the preparation of a Final Safety Analysis Report. He was responsible for planning and scheduling of engineering activities to support an 18-month preparation period and was required to interpret the requirements of Regulatory Guide 1.70, Rev 3 and to review all project designs with respect to the acceptance criteria of NRC Staff Standard Review Plans. Mr. Overbeck was responsible for the review of nuclear analysis supporting compliance with site selection criteria. This included analysis of nuclear accidents for radiological release calculations associated with compliance with the dose limitations of 10CFR50 Appendix I and activity releases of 10CFR20.

Project Nuclear Engineer. He was assigned as responsible engineer for five nuclear systems and two contracts; conducted design calculations and prepared System Design Descriptions and Process and Instrumentation Diagrams for each system. He was

GARY J. OVERBECK

responsible for the procurement of four nuclear cranes including the reactor building polar crane, and participated in linear and nonlinear seismic modal analysis. Mr. Overbeck prepared specifications, conducted bid evaluations and post award negotiations for post-accident hydrogen recombiners. He was responsible for all nuclear discipline responses to licensing issues, including preparation of amendments to the Safety Analysis Report and addressing NRC requests for additional information.

Coordinating Engineer. Mr. Overbeck was responsible for coordinating the analytical effort of a nuclear staff consisting of approximately 40 analysts to the needs of a 2-unit nuclear project. He insured that proper input and assumptions were used in all analyses. The analyses included all factors of nuclear power plant design including selection of the ultimate heat sink, containment subcompartment pressure analysis, accident analysis to demonstrate compliance with 10CFR100, and dose calculations to demonstrate compliance with 10CFR50. Mr. Overbeck coordinated the interpretations of NRC regulatory guides, and was responsible for the preparation of analysis to support responses to the NRC and testimony for the Atomic Safety and Licensing Board hearings.

Nuclear Analyst. He conducted analytical work consisting of both hand and computer calculations in the areas of shielding, radiation transport, dose calculations and accident analysis. The analyses conducted were for both a Pressurized Water Reactor (PWR) and a High Temperature Gas Reactor (HTGR). Mr. Overbeck was responsible for drafting the accident analysis and technical specification chapter of a Preliminary Safety Analysis Report for a HTGR.

U.S. Navy

1969 - 1974

Weapons Officer. Mr. Overbeck was responsible for the supervision of four divisions which included torpedo, fire control, sonar, and deck divisions of a nuclear attack submarine. This effort included the overall technical direction of the fire control system, maintenance and casualty control, as well as training and management of supervision and technical personnel. A major portion of this assignment (1 year) was an overhaul which required the coordination of activities of diverse interests, including plant technicians, shipyard tradesmen and vendor representatives.

Main Propulsion Assistant. He was responsible for the operation and maintenance of propulsion equipment which included S5W naval reactor, two ship service turbine generators, two main turbine generators, air conditioning units, distilling systems, and various auxiliaries required to support this equipment. Mr. Overbeck was responsible for the training and qualification of 23 men to operate and maintain the reactor and propulsion machinery.

Reactor Controls Division Officer. Mr. Overbeck was responsible for the operation and maintenance of nuclear instrumentation and reactor protection equipment. He was also responsible for the training and qualifications of reactor operators.

W. RANDALL BOYD

Senior Engineer

EDUCATION

B.S., Mechanical Engineering, Mississippi State University, 1980

Numerous courses for STA qualification including:

GE Station Nuclear Engineering

GE BWR 6 Technology

Mitigating Core Damages

BWR 6 Simulator - Grand Gulf Nuclear Station

PROFESSIONAL AFFILIATIONS

Member, American Nuclear Society

SUMMARY OF QUALIFICATIONS

Mr. Boyd has over seven years of experience in various supervisory, operational, testing, engineering and technical positions in the commercial nuclear power industry.

PROFESSIONAL EXPERIENCE

ERCI International

Mr. Boyd is currently with ERCI/Systems Integration and Management Corporation (SIMCO) serving in Operations Support Services. In this position he is responsible to provide a broad range of support services to SIMCO clients. These services include surveillance and maintenance programs development, upgrade/development of operations, surveillance and maintenance procedures, licensing support, staff augmentation and QA audits. He has participated in an utility sponsored Safety System Functional Inspection of the Donald C. Cook Nuclear Plant.

Nuclear Energy Services

Field Engineer. Under contract to Niagara Mohawk Power Corporation, Mr. Boyd served as an Operations Engineer. In this capacity, he was responsible for reviewing various systems for designed operability and human factors. This included review of engineering diagrams, design changes, preoperation tests, vendor manuals, FSAR, Tech Specs, licensing commitments and a physical walkdown of the system. Following the system reviews, he wrote the system operating procedures, off-normal and alarm response procedures.

While with Nuclear Energy Services, he held the position of I&C Supervisor responsible for the development of surveillance tests and maintenance procedures at the River Bend Nuclear Station. He was responsible for developing the I&C Surveillance Test procedure/Technical Specification Matrix, Surveillance Test Procedure Writer's Guide,

W. RANDALL BOYD

Surveillance Test Procedure Review Checklist, Logic System Functional Testing (LSFT) and Response Time Testing (RTT) Matrixes. He coordinated the program for LSFT and RTT between Operations and I&C. Mr. Boyd supervised 20 technical writers for developing and revising all I&C Surveillance Test Procedures. He assisted the utility in developing original Draft Tech Specs, scheduling performance of surveillance test procedures, reviewing tests results and resolving NRC concerns and open items. Mr. Boyd was responsible for writing all of the I&C Corrective Maintenance Procedures.

Mississippi Power & Light Company

Shift Technical Advisor (STA). At the Grand Gulf Nuclear Station, he assisted the Operations Department with reactor controls and conditions, Tech Specs, plant procedures and overall plant status. Other responsibilities as STA included Surveillance Testing and Tracking, and performing Post Scram Analysis.

As a Technical Engineer in Plant Staff, he had overall responsibility including operability, availability and troubleshooting of various systems. He proposed design changes to correct system problems and enhance system operation. This included implementing design changes, writing/performing tests of the changes and performing 10CFR50.59 safety reviews and evaluations. He assisted in the major review and rewrite of Tech Specs and surveillance procedures to comply with testing standards, regulatory guides, FSAR and existing plant design. Mr. Boyd assisted the Startup Organization in reviewing and performing pre-operational and acceptance tests, completing test exceptions and system turnovers to Plant Staff control. He was responsible for the following projects: Developing computer guides for monitoring parameters during a preliminary turbine roll. Reviewing and resolving the required increased maintenance and degraded performance of the Service and Instrument Air Compressors resulting from chemical fouling/impurities in the Plant Service Water System and a higher than designed for Service Water System pressure. Developed a computer program for determining a real-time plant thermal heat balance and a plant performance monitoring program.

JOHN J. BETTI

Senior Consultant

EDUCATION

Jamestown Community College

Numerous courses for SRO/RO Qualification including:

Basic BWR Introduction Course - General Physics

BWR Technology Course G.E.

BWR Simulator Training G.E. Dresden, IL

BWR Simulator Training - General Physics - Chattanooga, TN

NRC approved SRO License Requalification Program at TVA Simulator

PROFESSIONAL AFFILIATIONS

Member, American Nuclear Society

Licensed Senior Reactor Operator/Reactor Operator, James A. Fitzpatrick and Nine Mile Point Unit 1 Power Plants

SUMMARY OF QUALIFICATIONS

Mr. Betti has over twenty years of experience in various supervisory, management and operational positions in the commercial nuclear power industry and a background in naval and commercial fossil plant operations.

PROFESSIONAL EXPERIENCE

ERC International

Mr. Betti is currently serving as a Senior Consultant in Operations Support Services. In this position, he is responsible for providing a broad range of support services to ERCI clients. These services include surveillance and maintenance program development, upgrade/development of operation, surveillance and maintenance procedures, licensing support and staff augmentation. He recently participated in the development and presentation of a seminar/workshop on root cause analysis for TVA.

He reviewed and revised Abnormal Operating Procedures to ensure each procedure reflected the correct changes in plant parameters. He identified symptoms leading to an event, the required corrective action, and identified entry into an Emergency Procedures or Action level from an Abnormal Procedure.

Mr. Betti was subcontracted to EBASCO of New York and assigned to Laguna Verde Nuclear Generating Station located in Veracruz, Mexico where he worked closely with the Operations Manager reviewing and revising procedures and technical specifications.

JOHN J. BETTI

Nuclear Energy Services

Group Manager of the NES Baton Rouge Office. He was responsible for managing the NES Southern Regional Office, project management of Technical Specification and Procedure Development at Gulf States Utilities River Bend Site and Niagara Mohawk Power Corporations Nine Mile 2 site, and marketing and sales of NES Engineering Services.

In addition, Mr. Betti held the position of Field Engineering Manager responsible for the management and direction of the NES multidisciplined field engineering staff on location at various nuclear plant sites and the sales of Field Engineering Services.

Quadrex Corporation

Mr. Betti was employed as Supervisory Service Engineer, assigned to Grand Gulf Nuclear Power Station as Startup Test Coordinator. He was responsible for being cognizant of all testing activities in the plant, assisted Operations Shift Supervisors and pre-operations personnel in resolving problems dealing with field test activities. Additionally, he served as the focal point for resolution of support problems encountered by field test personnel. Mr. Betti assisted the Operations Superintendent as his Assistant Operations Superintendent. He was responsible for writing administrative procedures, systems and operating instructions, directing the Operations Department and serving as a member of the PSRC (Plant Safety Review Committee) in the absence of the Operations Superintendent. While assigned to Grand Gulf, his duties also included serving as a Shift Supervisor directing plant operations and testing, and supervising all shift personnel.

Niagara Mohawk Power Corporation

Shift Supervisor, Shift Operating Foreman and Reactor Operator at J. A. Fitzpatrick, Nine Mile Point Unit 1 and Unit 2 Nuclear Power Plants. During his fourteen years with Niagara Mohawk Power Corporation, he held Senior Reactor and Reactor Operator Licenses, and was responsible for all administrative control of J. A. Fitzpatrick and Nine Mile 1 Nuclear Power Stations. He supervised all operators on shift and directed the shift operation of the Power Stations. He also participated in the startup, preoperational testing, initial fuel loading, power testing and commercial operation of both Nine Mile, Unit 1 and F. A. Fitzpatrick Nuclear Power Plants. Mr. Betti also worked at Nine Mile, Unit 2 Nuclear Power Plant where responsibilities included system design description, review, preparing operating procedures and supervising shift operations. In the non-nuclear areas of Niagara Mohawk Power Corporation, he was a Tester in the Meter and Test Department for six months, where his duties included the

JOHN J. BETTI

testing and repair of electric meters. He also was a Technician at Dunkirk Fossil Steam Station in the Operation and Technical Group, and was responsible for testing and repair of the power plant's instruments and controls and the analysis of plant operating efficiency records.

U. S. Navy

During a four year term with the U.S. Navy, Mr. Betti was a Machinist Mate on naval surface craft and was responsible for the operation and maintenance of ships propulsion and electrical generation plants.

STUART M. KLEIN

Principal Engineer

EDUCATION

B.S., Pennsylvania State University, 1960

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer

SUMMARY OF QUALIFICATIONS

Mr. Klein's background includes a diversity of experience spanning over 25 years of engineering design in areas such as power plant systems and mechanical equipment design, industrial mechanical design, design review, and project management. He has over 12 years of power plant project assignments while employed with a major architect-engineering firm. These responsibilities included the detail design of mechanical systems with assignments of increasing supervisory and management responsibilities. Mr. Klein has also prepared preventive maintenance engineering evaluations for nuclear power plant equipment and has conducted design reviews associated with the design bases for qualification of electrical and mechanical equipment. Recently, Mr. Klein has participated in a number of design reviews of mechanical systems and equipment in operating power plants.

PROFESSIONAL EXPERIENCE

WESTEC Services, Inc.

1984 - present

Chief Mechanical Engineer. Mr. Klein is responsible for overseeing and directing the activities related to mechanical engineering design and design review of power plant process systems and major load handling equipment. He has directed the efforts necessary to develop preventive maintenance requirements for power plant equipment. In addition, he has served as a consultant to the Nuclear Regulatory Commission and participated in the design review of numerous safety-related nuclear plant systems, including inspections at Palisades, Crystal River, D.C. Cook, Calvert Cliffs, Fermi 2 and Palo Verde (SSFI) and Dresden (SSOMI). As a result of his investigative efforts, utilities have implemented design changes to piping systems where he had identified potential water hammer problem areas.

United Engineers & Constructors, Inc.

1972 - 1984

Supervising Engineer. Mr. Klein had lead responsibility for the Mechanical Group, Site Support Engineering for the Seabrook Nuclear Power Station in New Hampshire. Activities included work in all areas of the plant, both safety-related and the balance of

STUART M. KLEIN

plant systems, e.g., main steam, circulating water, feedwater systems, and related auxiliary systems. Mr. Klein's personal responsibilities included directing the work of the engineers and designers, reviewing and approving drawings, documents and specifications for plant modifications, and, in general, supporting the construction and startup efforts to complete the Seabrook project.

During this period, Mr. Klein originated the system designs for the station service water system and a number of other cooling systems, e.g., the component cooling water system. He completed extensive trade-off studies to determine optimum system concepts, equipment sizes and parameters for wet and dry cooling towers, heat exchangers, pumps, etc. He developed final detail designs and directed procurement activities associated with these systems. Much of the conceptual work for these activities was described in a paper entitled "Emergency Shutdown Cooling Towers - Considerations in the Evolution of an Optimum Tower Design." The paper was published in the industry journal Nuclear Safety.

Mr. Klein appeared before the NRC Staff to substantiate the design of essential cooling water systems.

Westinghouse
Bettis Atomic Power Laboratory

1969 - 1972

Senior Design Engineer. Mr. Klein was responsible for the design of nuclear reactor plant fluid systems for NIMITZ class nuclear aircraft carriers. He conducted design analysis to assure successful hydraulic and thermal performance of the systems.

United Aircraft Corporation

1963 - 1969

Design Engineer. Mr. Klein was responsible for the design of aircraft propeller systems and components, pitch change mechanisms, and blade retention systems. Also designed aircraft air inlet control systems, hydraulic actuators, and servomechanisms. Involved in design tradeoff studies to determine optimum control configurations.

North American Aviation, Inc.

1962 - 1963

Research Engineer. He was responsible for design of engine actuation system for Saturn II Space Vehicle.

STUART M. KLEIN

United Aircraft Corporation

1960 - 1962

Development Test Engineer. Mr. Klein was responsible for the development testing of jet engine fuel control systems, hydro-mechanical feedback control servomechanisms. He has a wide background in the development testing of precision control system components, e.g., flapper control valves, servo controlled linear throttle valves, linkages, pressure control valves, and force balance systems.

STANLEY F. KOBYLARZ

Principal Engineer

EDUCATION

Lehigh University, BS in Electrical Engineering, 1977
Drexel University, Various Courses in Electrical Engineering, 1979
Community College of Philadelphia, IBM PC Training Courses in dBASEIII+ and
LOTUS 1-2-3, 1986

PROFESSIONAL AFFILIATIONS

Professional Engineer, Commonwealth of Pennsylvania
Member, Institute of Electrical and Electronic Engineers (IEEE)

SUMMARY OF QUALIFICATIONS

Mr. Kobylarz has over 14 years of electrical engineering and design experience with architect-engineer and consulting firms servicing the power generation industry. He has a diversity of experience in the electrical discipline having worked as an electrical designer, electrical engineer, and finally, as a supervising electrical engineer. In the latter position, he has over 4 years of experience in responsible charge of design and engineering activities associated with both new construction projects and plant modifications. He also has substantial experience in the implementation of NRC licensing requirements for station power systems and equipment and has conducted Safety System Functional Inspections (SSFI) for both the USNRC and commercial utilities, and design reviews for the Department of Energy reactor facilities and the Tennessee Valley Authority.

PROFESSIONAL EXPERIENCE

WESTEC Services, Inc.

1987 - present

Principal Engineer. Mr. Kobylarz is a member of the electrical discipline of the WESTEC System Engineering Division, responsible for electrical design, design review, and related engineering and consulting activities. He is currently assigned to WESTEC's Safety System Functional Inspection (SSFI) team as an electrical design reviewer having conducted SSFIs at Robinson, Monticello, Cooper, D.C. Cook, Calvert Cliffs, Fermi 2 and Palo Verde, and an Operational Safety Team Inspection (OSTI) at Crystal River. In addition, he performed safety system design reviews for Pilgrim and for the Department of Energy "N" reactor, Hanford.

United Engineers & Constructors, Inc.

1974 - 1987

Supervising Electrical Engineer (Public Service Company of New Hampshire, Seabrook). He provided technical review and direction for the electrical plant design modification group activities at the Seabrook Station site.

STANLEY F. KOBYLARZ

Tennessee Valley Authority (Sequoyah Nuclear Plant Unit 1). Mr. Kobylarz reviewed plant technical specification bases and the FSAR for proposed plant design modifications and temporary alterations/modifications for determination of Unreviewed Safety Questions in accordance with 10CFR50.59.

Washington Public Power Supply System (Nuclear Project No. 1). He supervised the electrical design and engineering for WNP #1 a 1200 MWe pressurized water reactor generating station, Hanford Reservation, WA, and was in charge of over 15 discipline engineering and design personnel. Mr. Kobylarz was directly responsible for reviewing and evaluating licensing requirements such as NUREG-0800 and Appendix "R" and implementing required design changes in the discipline.

Tennessee Valley Authority (Watts Bar 1 and 2). Mr. Kobylarz performed calculations and evaluations of motor breakdown KW requirements, assisting TVA engineering in the Watts Bar diesel generator loading analysis.

Tennessee Valley Authority (PIUS Reactor Evaluation Study). He was responsible for the design review of the electrical and process system interface design for an ASEA-ATOM SECURE-P type reactor power generating station as part of the PIUS Reactor Evaluation Study on the cost and licensability to construct a SECURE-P plant in the United States.

Ente Nazionale Per L'Energia Elettrica (ENEL). Mr. Kobylarz checked electrical equipment design calculations for sizing the station battery and uninterruptible power supply (UPS), station auxiliary transformers, standby diesel generators, motor control centers and power distribution centers for a 980 MWe pressurized water reactor generating station, acting as a consultant to ENEL for their national energy plan.

Electrical Engineer (Washington Public Power Supply System, Nuclear Project No. 1). He was responsible for electrical design and implementation of reactor (NSSS), engineered safety features, and non-NSSS safety-related control systems. Mr. Kobylarz supervised the preparation of single-line and electrical schematic diagrams, and was responsible for procurement coordination with the related motor control equipment contractor. He was also responsible for the electrical design of the main control room panels and auxiliary equipment, and was the liaison electrical engineer on the Control Room Human Factors Task Force for the main control room.

Electrical Designer (Washington Public Power Supply System, Nuclear Project No. 1). Mr. Kobylarz was responsible for the layout of the 480 volt plant distribution system, including preparation of single-line diagrams and control schematic diagrams. He was the responsible lead designer and group leader for control and cabling schematics for the NSSS controls, major pumps and drives, and valve controls, including main steam and feedwater isolation valves.

WILLIAM C. SHERBIN
Principal Engineer

EDUCATION

B.S.M.E., Bucknell University, 1971
M.S.M.E., University of Maryland, 1973

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer, Commonwealth of Pennsylvania and Maryland
Member, American Nuclear Society

PROFESSIONAL EXPERIENCE

WESTEC Services, Inc.
1987 - Present

Mr. Sherbin has seventeen years of mechanical engineering experience and has worked for the past eight years in the nuclear power industry. He is assigned to the Philadelphia Area Office of WESTEC's Power Engineering Division. His principal duties involve design inspection activities for nuclear utility clients and has participated in utility sponsored SSFTs at Fermi 2 and Point Beach Units 1 & 2, and Tech Spec. verification at Fermi 2. As a member of the Fermi 2 inspection team, in the area of maintenance, Mr. Sherbin identified problems associated with the control of MOV torque switch settings.

Independent Consulting Engineer
1985 - 1987

Mr. Sherbin served as a consulting engineer at the Nine Mile Point 2 Nuclear Station in Oswego, New York. He was a Senior Engineer in the Technical Support Group and was responsible for reviewing NRC, INPO and industry generated operational experience in the form of SOER's, SER's and IE Notices. A detailed analysis of events was submitted to the Operations Department regarding the examination of equipment design and procedures with regard to their impact on safety and licensing. He was also a Program Manager for Liberty Technology in Philadelphia, and was responsible for the development of a valve operator test and evaluation system. This system used strain gages and signal processing to measure motor operated valve performance.

Proto-Power Corporation
1983 - 1985

Mr. Sherbin spent two years on-site at Public Service Electric and Gas Company's Salem Nuclear Generating Station in New Jersey. He was under a contract with Proto-Power Corporation to provide engineering services to the Nuclear Engineering Department and was a Senior Engineer in the Systems Analysis Group. While in this position, he was responsible for preparing mechanical Safety Evaluations of nuclear plant primary and secondary systems, including reactor protection, chilled water, service water, HVAC systems, and seismic and vibration analyses. The evaluations and analyses were performed in accordance with ASME Codes, IEEE Standards and NRC Regulation Guide compliance. He also performed failure mode and effects analyses on components and systems.

WILLIAM C. SHERBIN

General Electric Company

1980 - 1983

He was employed by the General Electric Company at their Nuclear Energy Division in Wayne, Pennsylvania. He was a Senior Engineer, responsible for seismic and dynamic qualification of nuclear plant equipment supplied to the utilities by GE. This equipment included complete control room packages, motor control centers, emergency diesel generators and pipe-mounted sensors. Complete equipment qualification documents were developed for the utilities and NRC seismic auditors. These documents included vibration test data, plant seismic response spectra and the development of conceptual methodologies for the basis of the seismic and dynamic qualification of the equipment. He was also responsible for submitting the Seismic Qualification Review Team (SQRT) documents for the Hanford, Limerick, Shoreham, Grand Gulf, Perry and Susquehanna Nuclear Control Room and Diesel Generator Equipment.

Westinghouse Electric Corporation

1971 - 1980

Mr. Sherbin was also employed by the Westinghouse Electric Corporation for nine years as a Senior Engineer in their Heating and Cooling Division and as a Design Engineer in their Aerospace Division. While in the Heating and Cooling Division, he developed components and systems for solar thermal energy conversion. These components and systems were utilized in over two dozen experimental solar heating and cooling systems. While in the Aerospace Division, he was an engineering designer of mechanical equipment, including precision gear boxes for radar, servo mechanisms and hydraulic control systems. All of this equipment was certified for the thermal and vibration environments encountered in shipborne and aerospace applications.

FRANK W. TANNER

Senior Electrical Engineer

EDUCATION

B.S. and B.A. degree in Mechanical Engineering, University of Kentucky, 1969
M.S. and M.A. degree in Mechanical Engineering, University of Kentucky, 1971

SUMMARY OF QUALIFICATIONS

Mr. Tanner has 17 years of experience in commercial nuclear power industry in various supervisory positions as well as an engineer responsible for the design of instrumentation and control (I&C) processing systems.

PROFESSIONAL EXPERIENCE

Mr. Tanner is presently assigned to the Division of Nuclear Engineering as the Senior Electrical Engineer in the Electrical Engineering Branch in the I&C Group. Serves as Central Staff Specialist for I&C applications, procurement, and equipment qualification for TVA nuclear plants. This includes preparing design standards and guides, technical adequacy reviews of assigned project documents, ensuring consistency in design approach for the above areas of responsibility for TVA nuclear plants.

JAMES L. THOMPSON

Surveillance Supervisor

EDUCATION

Basic Electronics Course, Cleveland Institute of Electronics
Plant Systems Familiarization Training Program
Reactor Physics
U. S. Navy Electronics Technician

PROFESSIONAL AFFILIATIONS

N/A

SUMMARY OF QUALIFICATIONS

Mr. Thompson has eight years of experience in both fossil and nuclear power plant operation and three years of experience in the Quality Assurance (QA) Staff as an evaluator. He presently is serving as section supervisor of the QA Surveillance Group.

PROFESSIONAL EXPERIENCE

TVA

Mr. Thompson is currently serving as the QA Surveillance Group Supervisor. In this position he is responsible for personnel performing operation and technical surveys.

As QA Evaluator Mr. Thompson was responsible for performing surveys (programmatic and activity) as assigned for the purpose of identifying existing and/or potential problems.

As Assistant Shift Engineer Mr. Thompson was responsible for the overall operation of a nuclear generating unit and to directly supervise on or more unit operators along with indirect supervision of one or more assistant unit operators. He was also responsible for clearances and temporary alteration control forms as assigned.

As Unit Operator Mr. Thompson was responsible for the operating of Nuclear and/or Fossil Power Plant unit and the direct supervision of one or more assistant unit operators and indirect supervision of one or more auxiliary operators.

As Assistant Unit Operator Mr. Thompson was responsible for the operation of a Fossil Power Plant unit equipment as assigned and for providing direct supervision of one or more auxiliary unit operators.

RON F. MCCRANEY**Quality Assurance Specialist****EDUCATION**

BS, Accounting and Business Administration from Troy State University, 1969
Quality Control Coordinator, Level II, ANSI N45.2.6, 1973, May 1976
QC Mechanical Inspector, Level I, ANSI N45.2.6, 1973, August, 1977
Lead Auditor (Project Certification) ANSI N45.2.23, 1976 (Draft Form),
August, 1977
Level II P.T. Examiner, ANSI-TC-1A, November, 1977
QC Welding Inspector, Level I, ANSI N45.2.6, 1973, April, 1977
QC Civil Inspector, Level I, ANSI N45.2.6, 1973, September, 1978
Auditor (Corporate Certification) ANSI N45.2.23, 1976 (Draft Form),
August, 1979
QC Engineering Aide, Level I, ANSI N45.2.6, 1973, January, 1979
QC Electrical Inspector, Level I, ANSI N45.2.6, 1973, February, 1979
Lead Auditor (Corporate Certification) N45.2.23, 1976 (Draft Form),
January, 1980

(All of the above were obtained at the Farley Nuclear Plant, Dothan, Alabama, DCC).

Certified Professional Quality Assurance Lead Auditor, L. Marvin Johnson and Associates, Orlando, Florida, November, 1979
General Quality Control, Certified Level III, ANSI N45.2.6, 1973, Enrico Fermi II Project, Daniel International Corporation, Monroe, Michigan June, 1980
Mechanical/Welding, Certified Level III, ANSI N45.2.6, 1978, Wolf Creek Generating Station, Daniel International Corporation, New Strawn, Kansas, September, 1982
General Quality, Certified Level III, ANSI N45.2.6, 1978 Wolf Creek Generating Station, Daniel International Corporation, New Strawn, Kansas December, 1983

PROFESSIONAL AFFILIATIONS

American Society for Quality Control

SUMMARY OF QUALIFICATIONS

Mr. McCraney has 14 years of quality control/assurance experience in commercial nuclear power plant construction.

PROFESSIONAL EXPERIENCE**TVA**

Mr. McCraney is currently serving as a Quality Assurance Specialist responsible for performing program and technical audits.

6/88

2/2

RON F. MCCRANEY

Daniel International Corporation

Mr. McCraney has served numerous consultant positions through Daniel International Corporation assigned to several major utilities. He also has served in supervisory positions responsible for Quality Control Inspection Personnel.

05801

W. A. PRUETT, JR.**Quality Assurance Specialist****EDUCATION**

BBA, Management from Georgia State University, 1972
SRO - Georgia Institute of Technology
SRO - J. M. Farley Nuclear Plant, Alabama Power Co.
U. S. Navy

SUMMARY OF QUALIFICATIONS

Mr. Pruett has 23 years in the commercial nuclear power industry and six years background in naval nuclear powered ships.

PROFESSIONAL EXPERIENCE**TVA**

Mr. Pruett is currently serving as a Quality Assurance Specialist responsible for performing program and technical audits. He is certified as a lead auditor. Also he has participated in several special projects which included exaltation of configuration management and functioning as a shift operating advisor during Sequoia restart activities.

IMPELL**Senior Lead Engineer**

Primary job function to develop an engineer training program for the South Texas Project.

President, IsoTrain

Responsibilities included managing business and financial operations of the organization and writing proposals and contracts. Also performed training related work at Davis-Besse, Crystal River, Seabrook, Indian Point 3, and Catawba.

**Program Management, accreditation Department, Institute
of Nuclear Power Operations, Atlanta, GA**

Responsibilities included participating as an operations evaluator, training and qualification evaluator, and accreditation evaluator on over 50 evaluation trips to various nuclear utilities around the country. Each evaluation trip involved studying information related to the utility, visiting the utility, then making recommendations for improvements in observed problem areas. Also in original group of 8 individuals that established nuclear industry accreditation criteria.

W. A. PRUETT, JR.

Shift Supervisor, J. M. Farley Nuclear Plant, Alabama
Power Company, Ashford, AL

Responsible for the safe and efficient operation of an 850 MWe Westinghouse pressurized water reactor. Training included nine months at the Westinghouse Training Center, Zion, Illinois, followed by on-site training and Senior Rector Operator license from the Nuclear Regulatory Commission.

Shift Supervisor, Georgia Tech Research Reactor,
Atlanta, GA

Responsible for the safe and efficient operation of a 1000 kilowatt thermal neutron research reactor. Primary research function was to examine thermal neutron reactions with various materials through the process of neutron activation analysis.

U. S. NAVY

Training included one year of theory and practical application in the nuclear power program. Eventual assignment of nuclear powered ship.

05791

VII

INSTRUCTIONS FOR COUNTERPARTS
AND
TRANSFER OF TECHNOLOGY PERSONNEL

SECRET

UNITED STATES GOVERNMENT

Memorandum

R 89 880608 854
TENNESSEE VALLEY AUTHORITY

TO : Technology Transfer Personnel Listed on Attachment 1

FROM : T. E. Burdette, Chief, Nuclear Quality Audit and Evaluation Branch,
LP 4N 65E-C

DATE : JUN 08 1988

SUBJECT: NUCLEAR QUALITY AUDIT AND EVALUATION BRANCH SPECIAL INSPECTION NO.
BFA88811 - RHR SERVICE WATER AND EMERGENCY EQUIPMENT COOLING WATER
SYSTEMS - SAFETY SYSTEMS FUNCTIONAL INSPECTION (SSFI) (99)

PURPOSE

The purpose of this memorandum is to identify "observer" technology transfer personnel and provide these personnel with basic information concerning the SSFI.

BACKGROUND

This special inspection has been requested by corporate TVA management and presented to NRC as part of the overall restart technical verification program. This SSFI is being performed by the Nuclear Quality Audit and Evaluation Branch with technical assistance from Energy Resources Management Company, Inc. (ERCI). The inspection will address those areas identified on the inspection schedule and scope document R89 880523 845. Team members and functional areas being inspected are also identified in the schedule and scoping document.

ACTIONS

"Observer" technology transfer personnel are scheduled for participation in accordance with Attachment 1. Deviations to this schedule should be discussed with me or W. A. "Sonny" Pruett. To maximize benefits from team discussions, observers should be familiar with the Browns Ferry RHR Service Water and EECW Systems drawings and major components. They should also have read FSAR and Technical Specification commitments in these areas. It is expected that personnel will participate in inspection activities as much as possible, including daily team meetings to be conducted at 4:00 p.m.

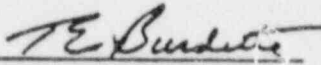


Technology Transfer Personnel

NUCLEAR QUALITY AUDIT AND EVALUATION BRANCH SPECIAL INSPECTION NO. BFAS8811 - RER SERVICE WATER AND EMERGENCY EQUIPMENT COOLING WATER SYSTEMS - SAFETY SYSTEMS FUNCTIONAL INSPECTION (SSFI) (99)

RESPONSE

A response this memorandum is required. For tracking purposes of involved personnel, this memorandum should be signed at the completion of the observation period and submitted to me or W. A. "Sonny" Pruett. Date of actual participation should also be indicated.


T. E. Burdette

Observer Signature

Dates of Participation

WAP:SMM
Attachment
cc (Attachment):
See Attachment 1

05771

Attachment 1

SSFI "Observer" Technology Transfer Schedule

P. R. Bevil	June 23, 24
C. E. Bosley	June 22, 23, 24
R. A. Hagar	June 20, 21, 22
R. W. Jarvis	June 9, 10
G. D. Kent	June 7, 8
A. M. Wilkey	June 20, 21, 22

1. Observer personnel should report to the BF Training and Visitor Center, Room 229, Extension 3412 for initial assignments.
2. Normal work hours will be 7:00 a.m. - 3:30 p.m. A team meeting with observers as participants will commence at 4:00 p.m. in Room 229.

05771

INSTRUCTIONS FOR COUNTERPARTS TO SUPPORT SAFETY

SYSTEM FUNCTIONAL INSPECTION (SSFI)

John Sparks (Systems Engineering Supervisor - Extension 2493) will be the TVA team leader. Mosi Dayani, Extension 3357, will be assisting him in coordinating the activities and assuring progress in responding to questions. During the course of inspection, please observe the following points.

- Be professional in your conduct with the team members. You should not be defensive or offensive in answering the questions, however, you should be honest, direct, to the point, and courteous.
 - Make sure you clearly understand the question before answering. If you don't know the answer, do not hesitate to say so and indicate that we will find the answer for them. We want to speak in one voice and avoid giving conflicting responses.
 - Fill out the form (provided by Quality Assurance) for every question that is asked. You are responsible for identifying the organization and individual to address the question. This should be done as soon as possible to allow maximum time to answer the question.
 - All responses to the questions should be completed in twenty-four hours if at all possible.
 - When you are asked questions that seem odd, or you don't know why they are asking it, please discuss that with the team member. We would like to know where they are coming from, and if there is a trend in their line of questioning, in order to learn from it and also better support their inspection. By knowing where they are heading we can prepare to answer their questions better.
 - There will be a meeting every day at 4:00 p.m. in the Administration Building Conference Room. You are required to attend this meeting.
- Objectives are:
- Review the questions each day.
 - Review the action item list for questions/responses.
 - Educate the TVA team leader (John Sparks) on the issues, questions not being properly responded to, and overall progress.
- Each action item, such as maintenance requests and/or condition adverse to quality reports, generated from the inspection should be clearly identified as SSFI related action so that the responsible person handling it is aware of its significance. There should be no excuse for not understanding the question or its priority.

VIII

SSFI ACTION ITEM TRACKING SYSTEM

UNITED STATES GOVERNMENT

Memorandum

884 880607 879

TENNESSEE VALLEY AUTHORITY

TO : Those listed

FROM : W. A. Conley, Assistant Safety System Functional Inspection Task
Manager, PSB K, Browns Ferry Nuclear Plant

DATE : JUN 07 1988

SUBJECT: BROWNS FERRY NUCLEAR PLANT (BFN) -- SAFETY SYSTEM FUNCTIONAL
INSPECTION (SSFI) - ACTION ITEM (AI) TRACKING SYSTEM

To assist in providing prompt and accurate follow-up to the BFN SSFI team and counterparts, a controlled AI system is being initiated.

Each counterpart is responsible for identifying SSFI AIs on the input sheet (see Attachment 2). All responses to AIs will be identified on the AI Response Form (see Attachment 3). All fields on the forms must be completed.

A computer print out of the AIs and their status will be published only to John Sparks.

Original
Signed By

W. A. Conley

- W. G. Askew, T17, BFN
- C. E. Brush, T17, BFN
- G. T. Chambers, PMC F, BFN
- T. L. Chinn, PAB G, BFN
- M. Dayani, PEB A4, BFN
- L. W. Holloway, PEB A4, BFN
- G. F. McConnell, PMC D, BFN
- C. R. McIntosh, T17, BFN
- J. R. Serafin, MOD A6, BFN
- J. L. Sparks, PEB A4, BFN
- J. P. Stapleton, PAB G, BFN

WAC:LJH

Attachments: Attachment 1 Input Sheet Instructions
Attachment 4 Definitions

cc (Attachments):

- RIMS, MR 4N 72A-C
- T. E. Burdette, LP4N 65E-C

0873J



ATTACHMENT 1

INPUT SHEET INSTRUCTIONS

Action Item Number - A tracking number of the following form: System Number - Chronological Number; for example, 24-01 for the first action item associated with system 24.

Revision - The current revision of this action item - Revision 0 is the initial revision of all action items.

Date Prepared - The date this input sheet was prepared.

Date Received - The date the action item was identified by the SSFI team.

Action Item Description - A clear, concise description of the action item.

Responsible Organization - The organization assigned to prepare a response to the action team.

Name - The individual assigned to respond to the action item.

Telephone - The telephone extension to contact the individual assigned to respond of the action item.

Prepared by - The SSFI counterpart identifying the action item.

Discipline - The SSFI counterpart discipline.

Supervisor - The SSFI team leader counterpart.

ATTACHMENT 2

BFN SSFI ACTION ITEM TRACKING SYSTEM INPUT SHEET

ACTION ITEM NUMBER _____ REVISION _____

DATE PREPARED _____ DATE RECEIVED _____

ACTION ITEM DESCRIPTION _____

RESP ORG _____ NAME _____ PHONE _____

PREPARED BY _____ DISCIPLINE _____

SUPERVISOR _____ SSFI TEAM MEMBER NAME _____

ATTACHMENT 3

BFN SSFI ACTION ITEM RESPONSE FORM

ACTION ITEM NUMBER _____ REVISION _____
DATE PREPARED _____ DATE PROVIDED TO SSFI TEAM _____

NOTES:

- Response should be provided within 24 hours, if possible.
- Responsible organization should provide any specific information that is requested or any other information that could alleviate the concern.
- Each of the following items should be specifically addressed in the response if it is determined that a concern exists:
 1. Probable root cause as to why the concern exists.
 2. Extent of concern, and how determined (if bounded, why is it bounded)?
 3. Action necessary to correct concern, including date when action will be implemented.
 4. Action necessary to prevent recurrence, including date when action will be implemented.
 5. Significance of concern and basis of significance.
 6. When a concern requires a Condition Adverse to Quality (CAQR) (per SDSP 3.7) or a Maintenance Request (MR) (per SDSP 7.6) the number shall be referenced.

Use additional pages as required to provide a complete response.

1. Root Cause

2. Extent

BFN SSFI ACTION ITEM RESPONSE FORM

ACTION ITEM NUMBER _____ REVISION _____

3. Corrective action and date.

4. Preventive action and date.

5. Significance

6. CAQR Number _____ DATE _____

MR NUMBER _____ DATE _____

CORRECTIVE ACTION DUE DATE _____

PREVENTIVE ACTION DUE DATE _____

PREPARED BY _____ DATE _____

SUPERVISOR* _____ DATE _____

REVIEWER** _____ DATE _____

*Signature of supervisor indicates approval of above information for schedule, accuracy, and adequacy.

**Signature of reviewer indicates agreement with the above information by the SSFI team.

ATTACHMENT 4

DEFINITIONS

1. Closed - This indicates the information on the Action Item (AI) Response Form is agreed to by the Supervisor and Reviewer and the corrective and preventive actions are finished.
2. Resolved This indicates the information on the AI Response Form is agreed to by the Supervisor and Reviewer and the corrective and preventive actions are not finished.
3. Significance - Addresses the AI's safety implications and generic applicability of the concern across disciplines, systems, and programs.

IX

TVA PERSONAL SERVICES CONTRACT NUMBER TV-73786A,
TASK SCOPING DOCUMENT

L27 880519 801

5N 51A Blue Ridge Place

MAY 19 1988

Mr. Michael Stafford
ERCI Inc.
3211 Jermantown Road
P.O. Box 10107
Fairfax, Virginia 22030

Dear Mr. Stafford:

Reference: Our May 18, 1988 telecon

This provides written confirmation of the authorization given (reference telecon above) for ERCI to provide the services of six team members in support of the Browns Ferry Nuclear Plant Safety System Functional Inspection as described in the enclosed task scoping document. These services will be provided under personal services contract No. TV-73786A from May 23, 1988, until August 5, 1988, at a cost not to exceed \$330,939.

Provision of these services are subject to the terms and conditions of the referenced contract. In no event shall the ceiling amount of the contract be exceeded.

When billing for this work, please reference account number 8451-546070-X21881.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

James Q. Webber, Jr., Manager
General Services Contract Group
Contract Administration Branch

MAY 19 '88

JWD:BSB
Enclosure
cc (Enclosure):

RIMS, MR 4N 72A-C
L. B. Lundy, BR 5N 87A-C
R. W. Dibeler, LP 4N 105E-C
T. E. Burdette, LP 4N 65E-C

5506f

TASK SCOPING DOCUMENT
BROWNS FERRY NUCLEAR PLANT (BFN)
SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI)
CONTRACT NUMBER TV-73786A

I. TASK OBJECTIVE

Contractor shall conduct an SSFI at BFN using the team concept, with the contractor supplying approximately half of the team members and the Tennessee Valley Authority's (TVA) Nuclear Quality Audit and Evaluation Branch (NQA&EB) supplying the other half. Contractor shall supply the team leader, assistant team leader, and four team members.

II. DISCUSSION/BACKGROUND

TVA has committed to the Nuclear Regulatory Commission (NRC) to perform the SSFI before startup of BFN. The SSFI which shall be conducted on the RHR service water system is conducted to provide additional confidence that system modifications, operations, maintenance, testing, and training, have not compromised the ability of safety systems to adequately function in accordance with its system functional requirements.

III. DETAILED TASK DESCRIPTION

The methodology for performing the SSFI is to be the same as that used by the NRC in their inspections. The methodology includes the following major elements. Each of these elements is described in detail.

1. Formation of a team of highly qualified and experienced inspectors including a team leader,
2. Development of an inspection plan for the selected system,

III. DETAILED TASK DESCRIPTION (Continued)

3. Performance of a vertical slice inspection, using interactive SSFI techniques,
4. Daily briefings with utility management by the team leader,
5. Development of Inspection Observation forms as issues or deficient conditions are identified, and
6. An exit meeting the final week on site
7. Preparation of a written report of the evaluation.

Team Composition

The evaluation team will be comprised of a team leader, an assistant team leader, three design reviewers (mechanical systems, electrical power, and instrumentation and controls), three plant activities reviewers (operation, maintenance, and testing), and a management reviewer (training, quality assurance, and procedural controls). Depending upon the system being evaluated and plant specific considerations, the functions of a particular position may be filled by two reviewers or the functions of two or more reviewers may be combined in a single inspector.

Inspection Plan

An inspection plan will be developed for the system(s) chosen for in-depth review. This inspection plan will contain an evaluation checklist for the various team members to commence the SSFI. The inspection plan will be general in nature and is to be used as a starting point and basic game plan, rather than a rigid checklist. The contractor will participate in the development of the inspection plan during preparation phase of the inspection.

Inspection Techniques

The interactive inspection technique, or the SSFI inspection technique, is the key to the success of this task. The success of the evaluation relies upon a number of individual inspectors conducting a deep vertical-slice inspection of their particular areas, along with daily interaction of the team members to identify and develop areas for further evaluation or analysis. During the onsite inspection periods, team meetings will be held each evening and each team member will describe their activities for that day, including any findings or questions which apply to their areas of responsibility. Questions raised or leads identified in one area are then followed and evaluated in other areas, often leading to identification of other problems or questions. As the interaction meetings proceed, a collective understanding of system design, operation, maintenance, testing, and training is established. The contractor's Team Leader or Assistant will direct this activity and individual inspectors will contribute.

Coordination with Management

Throughout the course of the SSFI plant management is to be kept informed as to the status of potential findings, observations, or other concerns through two paths: (1) individual team members are to ensure that their respective counterparts at the plant are fully aware of questions or potential problems (this information is passed to management through the normal chain of command) and (2) the team leader will brief the plant manager, superintendents, technical supervisors, or general supervisors on a daily basis, as desired by plant management. Since inspection team meetings will be held every evening when the team is on site, these team leader briefings will be held early on the following morning.

Inspection Observation Forms

Draft Inspection Observations will be written by the team as various discrepancies or weaknesses are identified. These draft Inspection Observations will be given to plant management during the progress meetings held each morning. These draft Inspection Observations are to be used as working documents and in many cases document team member concerns that have not yet been fully evaluated. Thus, further evaluation may be required to substantiate or to dismiss the concern. The purpose of the Inspection Observation is to identify the issue, regulatory basis or accepted industry practice, a discussion of the issue, examples of the weaknesses discussed, and comments as to the perceived safety significance. The intent is to clearly document the particular weakness observed so that TVA management does not have to resort to interpretation of verbal communication between the various reviewers and their counterparts within TVA.

Exit Meeting

Upon completion of the final on-site inspection week, an exit or post-evaluation meeting will be conducted for TVA management. At this meeting, each inspector will be expected to summarize the results of his or her findings and conclusions. The team leader will also present preliminary general conclusions relative to the overall function of the system and the general condition of the design control and modification process, system operation, and plant activities associated with the system.

Final Report

The contractor shall furnish a report of the activities observed during performance of the SSFI in a format consistent with that supplied by

IV. DESIGN BASIS AND REFERENCE DOCUMENTS

TVA shall make available to contractor all design documents, drawings, procedures, and site specific information necessary to complete this task.

V. DELIVERABLES/QUANTITIES

<u>Deliverable</u>	<u>Due Date</u>
A. Inspection Plan	June 3
B. Observation and Inspection Reports	Intermittent
C. Draft Summary Report	July 15
D. Response to Summary Report Comments	August 5
E. Final Summary Report	August 5

VI. SCHEDULE - MILESTONE AND ACTIVITIES

The following is a description of an SSFI schedule that ERCI has used successfully on four utility initiated SSFIS. It is tailored after the NRC's schedule, but slightly expanded in time frame to facilitate the exchange of information and to minimize the impact on other activities in progress at the time of the inspection.

Preparation

5/23 thru 5/27

(Week 1)

All team members travel to BFN for (1) training and badging, (2) familiarization walkdown of the same system, (3) presentations by various TVA program managers to describe recovery activities (i.e., design basis verification), (4) obtain key documents, including FSAR, P&IDs, system descriptions, one-line electrical drawings, schematics, logic diagrams, calculation, change packages, normal and emergency procedures, etc.

At their respective home offices, team members review the information gathered during week 1 and comment the preparation of individual inspection checklists.

5/31 thru 6/3
(Week 2)

At their respective home offices, team members continue the review of the information gathered during week 1 and complete the preparation of individual inspection checklists. The team leader will review the individual checklists and incorporate them into an inspection plan.

Inspection

6/6 thru 6/10
(Week 3)

Commence interactive review using SSFI techniques at the plant site. Meetings with management to report observations and discuss progress.

6/13 thru 6/17
(Week 4)

At their respective home offices, team members continue the review of the information gathered during Week 3 and prepare inspection observations.

6/20 thru 7/1
(Week 5 and 6)

Continue interactive review at the plant site, finalize observations, conduct exit meeting with management to report observations and status on 7/1.

Report Preparation

7/5 thru 7/15
(Week 7 and 8)

Prepare draft summary report and submit draft summary report to NQA&EB.

7/18 thru 7/29
(Week 9 and 10)

Draft summary report is reviewed by NQA&EB personnel.

8/1 thru 8/5
(Week 11)

Respond to review comments, finalize and submit final summary report.

VII. PROJECT CONTACTS

Contractor shall interface with the TVA SSFI coordinating manager, T. E. Burdette, the assistant coordinator W. A. Pruitt, or any other TVA personnel that is necessary for the performance of this task.

VIII. QA LEVEL IS

QA Level IS shall be assigned to the services associated with this task. This classification is for TVA internal use only. All work performed under this task shall be in accordance with Quality Notice, Revision 1, titled Procurement Control for Browns Ferry and Sequoyah Nuclear Plants, to NQAM, Part III, Section 2.1, Appendix B, Attachment 7, and TVA Quality Assurance/Quality Control program requirements and documented in compliance with established TVA procedures.

VII. REPORTING OF DEFECTS AND NONCOMPLIANCE

This task shall be subject to the requirements and civil penalty provision of 10 CFR 21, the regulations of the nuclear Regulatory Commission concerning reporting of defects and noncompliance (42 Fed. Reg. 28891 of June 6, 1977). In addition, the Contractor shall inform TVA immediately in writing of each defect or noncompliance reportable under 10 CFR 21. The notice to TVA is to be sent to the following address with a copy to the contracting officer: Tennessee Valley Authority, Attention: Mr. Ralph Shell, Manager of Regulatory Affairs, LP 4S 137B-C, 1101 Market Street, Chattanooga, Tennessee 37402-2801.

TVA-NRC MEETING TO DISCUSS

REACTOR WATER LEVEL ISSUES

JUNE 20, 1988

AGENDA

- O BACKGROUND
- O GENERIC LETTER 84-23
- O ACTIONS TAKEN TO ADDRESS WATER LEVEL MISMATCH EVENT
- O PRESENT PLANS
- O CONCLUSIONS

BACKGROUND

- 10/31/80 - NUREG 0737, ITEM II.F.2 - ENSURE INSTRUMENTATION IS SUFFICIENT TO DETECT INADEQUATE CORE COOLING
- 10/26/84 - GENERIC LETTER 84-23 - POTENTIAL IMPROVEMENTS TO WATER LEVEL INSTRUMENTATION
- 02/13/85 - BFN UNIT 3 WATER LEVEL MISMATCH EVENT
- 03/12/86 - TVA LETTER - TVA COMMITS TO REROUTE REFERENCE LEG BY CYCLE 7 REFUEL OUTAGES FOR ALL UNITS
- 08/28/86 - TVA NUCLEAR PERFORMANCE PLAN, VOL. 3 - TVA ACCELERATES MODIFICATION TO CYCLE 6 OUTAGE FOR UNIT 2
- 11/27/87 - NRC LETTER - NRC INITIAL REVIEW DETERMINED REROUTE OF REFERENCE LEG IS A RESTART ITEM
- 03/01/88 - TVA LETTER - JUSTIFICATION TO DELAY REFERENCE LEG REROUTE MODIFICATION UNTIL CYCLE 6 OUTAGE

GENERIC LETTER 84-23

○ CONCERNS:

- RELIABILITY OF MECHANICAL SWITCHES
- RELIABILITY OF LEVEL INDICATION DURING TEMPERATURE EVENTS

○ TVA RESPONSE

- INSTALLATION OF ANALOG TRIP UNITS (ATUs)
- REROUTE OF REFERENCE LEGS CYCLE 6 OUTAGE
- OPERATOR TRAINING
- DEVELOPMENT OF EOIs

ACTIONS TAKEN TO ADDRESS WATER LEVEL

MISMATCH EVENT

- INSTALLATION OF ATUs
 - LESS FREQUENT CALIBRATION
 - REDUCES POSSIBILITY OF AIR IN SYSTEM

- GE/TVA EVALUATION OF INSTRUMENT PIPING
 - GE RECOMMENDATIONS
 - INSTALL QUICK-DISCONNECT COUPLINGS ON INSTRUMENT RACKS
 - PROCEDURAL ENHANCEMENTS
 - STRESS ANALYSIS FOR EXISTING CONFIGURATION
 - CONCLUDED SAFE FOR ADDITIONAL CYCLE

- TRAINING OF OPERATIONS AND KEY PERSONNEL

- PROCEDURE ENHANCEMENT

- INSTALLATION OF QUICK-DISCONNECTS

PRESENT PLANS

o TVA PLANS FOR IMPLEMENTATION

- REROUTE REFERENCE LEG TO MINIMIZE VERTJ DROP IN DRYWELL
- DIVISIONALIZE WATER LEVEL INSTRUMENTATION FOR SCRAM REDUCTION

o JUSTIFICATION FOR CYCLE 6 IMPLEMENTATION

- COMPLEX DESIGN, REQUIRING CAREFUL STUDY
- NO STANDARD FIX; EACH PLANT UNIQUE
- HEAVY WORKLOAD IN DRYWELL
- UNCERTAINTIES OF NEW DESIGN
- AVOIDANCE OF PROBLEMS EXPERIENCED BY OTHER UTILITIES
- GE RECOMMENDATIONS IMPLEMENTED
- EOIS PROVIDE OPERATOR WITH NEEDED INFORMATION

CONCLUSIONS

0 PRESENT CONFIGURATION IS ACCEPTABLE

- GE REVIEW OF JULY 1986 CONCLUDED INSTRUMENTATION IS ACCEPTABLE FOR ADDITIONAL CYCLE
- COMPLETION OF UNIT : RESTART COMMITMENTS

Browns Ferry Nuclear Plant
Units 1, 2, and 3

cc:

General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
E11 B33
Knoxville, Tennessee 37902

Mr. R. L. Gridley
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. H. P. Pomrehn
Tennessee Valley Authority
Browns Ferry Nuclear Plant
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Decatur, Alabama 35602

Mr. M. J. May
Tennessee Valley Authority
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Decatur, Alabama 35602

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W10 B85
Knoxville, Tennessee 37902

Chairman, Limestone County Commission
P.O. Box 188
Athens, Alabama 35611

Claude Earl Fox, M.D.
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State Office Building
Montgomery, Alabama 36130

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Atlanta, Georgia 30323

Resident Inspector/Browns Ferry NP
U.S. Nuclear Regulatory Commission
Route 12, Box 637
Athens, Alabama 35611

Dr. Henry Myers, Science Advisor
Committee on Interior
and Insular Affairs
U.S. House of Representatives
Washington, D.C. 20515

Mr. S. A. White
Senior Vice President, Nuclear Group
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

BROWNS FERRY NUCLEAR PLANT
SAFETY SYSTEM FUNCTIONAL INSPECTION (SSFI) PLAN
BFA88811

Approved by TE Boudette Date 6-7-88

SAFETY SYSTEM FUNCTIONAL INSPECTION
BROWNS FERRY NUCLEAR PLANT
INSPECTION PLAN FOR RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM and
EMERGENCY EQUIPMENT COOLING WATER SYSTEM

1.0 Purpose

The purpose of this inspection plan is to provide guidance to reviewers for the review of plant design documentation and the conduct of walkdowns and personnel interviews during the Safety System Functional Inspection (SSFI). The Browns Ferry Nuclear Plant Unit 2 residual heat removal service water (RHRSW) system and the emergency equipment cooling water (EECW) system will be reviewed. The plan is not intended to be a checklist or a rigid format for the inspection. It is intended to serve as a starting point for the various directions that the inspection may take depending on the progress of the investigations and the weaknesses identified. Should any given area of investigation result in the identification of potential weaknesses, efforts may be intensified in this area in preference to another which is judged to have less potential for concern.

2.0 Scope

2.1 The inspection will focus on recent modifications Engineering Change Notices (ECNs) to the RHRSW and EECW systems, and supporting systems which will include:

- emergency AC and DC electrical systems
- standby coolant supply as a source for RHRSW and EECW systems
- interfaces with reactor building closed cooling water (RBCCW), raw cooling water (RCW), and raw service water (RSW) and hypochlorite systems
- heating, ventilating, and air-conditioning (HVAC) systems and equipment cooled by RHRSW and EECW systems.

2.2 The original design bases criteria and requirements will also be reviewed to establish commitments made for the design of these systems. Inspection and review will be intensified as appropriate to identify any weaknesses which may exist in the baseline design bases for these systems or in the design documentation developed to substantiate the modifications performed. Final Safety Analysis Report (FSAR) statements related to the design of the RHRSW and EECW systems will be verified.

2.3 The inspectors will also review the Sequoyah IDI findings for applicability to this SSFI.

2.4 Refinements to the above scope may be made subsequent to the initial review of the Browns Ferry RHRSW and EECW systems design to include additional scope details if appropriate.

3.0 Mechanical Systems

3.1 Initial Review

- 3.1.1 Review original and updated FSAR, system design descriptions, nuclear steam supply system (NSSS) design and interface requirements and criteria, and other documentation provided to identify regulatory commitments and design requirements for the residual heat removal service water system. Review will include criteria and commitments for interfacing systems such as standby coolant supply and HVAC systems.
- 3.1.2 Review design documentation such as system design descriptions, Process and Instrumentation Drawing; Piping and Instrumentation Diagrams (P&IDs), and component specifications to establish how these commitments were incorporated into the design.
- 3.1.3 Determine methods used to comply with design and regulatory requirements such as Nuclear Regulatory Commission Regulation (NUREG)-0800 Standard Review Plan 9.2.1 and 9.2.5, Service Water System and Ultimate Heat Sink, including:
 - 3.1.3.1 The type of cooling water supply.
 - 3.1.3.2 The ability to dissipate the total essential station heat load.
 - 3.1.3.3 The effect of environmental conditions on the capability of the RHRSW and EECW to furnish the required quantities of cooling water, at appropriate temperatures for extended times after shutdown.
 - 3.1.3.4 The effect of earthquakes, tornadoes, missiles, floods, and hurricane winds on the availability of the cooling water. The RHRSW and EECW systems are also reviewed to assure that adverse environmental conditions including freezing will not preclude the safety function of the systems.
 - 3.1.3.5 Sharing of cooling water sources in multiunit stations.
 - 3.1.3.6 Applicable design requirements such as the high- and low-water levels of the source to determine their compatibility with the service water system.
 - 3.1.3.7 The capability for detection, control, and isolation of system leakage including the capability for detection and control of radioactive leakage into and out of the system and prevention of accidental releases to the environment.

- 3.1.3.8 The effects of the failure of non-seismic Category I equipment, structures or components of safety-related portions of the System Walkdown Summary (SWS) are taken into account in the design.
- 3.1.4 Review index of modifications and design changes to RHRSW and EECW and interfacing systems during recent outages to identify packages which should be inspected in detail. Prepare list of packages required for detailed inspection.
- 3.1.5 Review calculation index to identify calculations related to compliance with design requirements and criteria, e.g., flow distribution in RHRSW and EECW systems, minimum flow requirements, maximum flow and runout (NPSH), other hydraulic calculations, and capability to satisfy Regulatory Guide 1.27 requirements related to shutdown with maximum anticipated temperatures. Where possible, select calculations for review which are associated with recent modifications.
- 3.1.6 Develop questions as necessary to pose to TVA/BFNP personnel for retrieval of required information and resolution of issues that have been identified.
- 3.2 Review of Modifications
 - 3.2.1 Review individual modification packages previously selected for inspection to determine effect of modifications performed on capability of RHRSW and EECW systems and interfacing systems to meet established commitments and design requirements.
 - 3.2.2 Review ECNs and temporary alterations (TACFs) to assure that system capability has not been degraded relative to established criteria and requirements.
 - 3.2.3 Review calculations related to each modification package to assure that changes are adequately substantiated and documented. Confirm that calculations are completed and verified in accordance with the requirements of American National Standards Institute (ANSI) N45.2.11.
 - 3.2.4 Review changes made relative to P&ID to assure that appropriate non-safety-related portions of the system have been adequately isolated from safety-related portions of the system where required. Confirm that non-seismic portions of the system are adequately isolated from seismic portions of the system and its interfacing systems where required to assure that the system can perform its safety function under all modes of operation.
 - 3.2.5 Perform a walkdown of the RHRSW system, EECW system, and interfacing systems comparing the as-installed and as-built configuration with that reflected on design drawings, e.g., P&IDs and other documents, where necessary.

- 3.2.6 Review modifications to assure that provisions have been made to perform post-modification testing of those changes which affect the capability of the system to perform its safety function. Review appropriate operating procedures to assure that changes in procedures are properly incorporated where modifications affect system operational requirements. Confirm that the modified design can be operated as originally intended and that assumptions made in related analyses concerning operator actions and response times are accurately incorporated into appropriate procedures.
- 3.2.7 Where necessary, review maintenance procedures to assure that special maintenance requirements established as a result of modifications made are properly included in these procedures.
- 3.2.8 Review 10CFR50.59 Safety Evaluations associated with modifications to assure that the modified design has been correctly evaluated for the identification of all safety issues and potential reductions in design margins.
- 3.2.9 Confirm that the modified design of the RHRSW, EECW and interfacing systems is consistent with requirements specified in Technical Specifications.

3.3 Supplementary Reviews

- 3.3.1 Review Q-List to confirm that entries are being accurately recorded. Confirm that safety-related and non-safety-related, Q and non Q, components are correctly designated for modifications made to the RHRSW and EECW.
- 3.3.2 Review basis for establishing motor-operated valve design parameters and their relationship to torque switch settings. Confirm that opening and closing settings are appropriately related to worst-case differential pressure for any mode of operation. Review the basis for maximum differential pressure to assure that all modes of plant operation have been adequately accommodated.
- 3.3.3 Review modified design to assure that established setpoints have been appropriately revised to reflect any changes in the system functional design. Confirm that the bases for these setpoints have been adequately substantiated by documented analyses.
- 3.3.4 Review modified designs to assure that special considerations, e.g., seismic II/I and internally (or externally) generated missiles, have been adequately evaluated and documented.

4.0 Electrical Power Systems

4.1 Initial Review

- 4.1.1 Review FSAR sections, basis documentation, Technical Specifications, NSSS design and interface requirements and criteria to identify regulatory and design requirements for electrical power systems which support the RHRSW and EECW systems.
- 4.1.2 Review index of modification design changes to RHRSW and EECW systems and interfacing systems during recent outages to identify packages which should be inspected in detail. Prepare list of packages required for detailed inspection.

4.2 Review of Modifications

- 4.2.1 Review individual modification packages selected for inspection to determine effect of modifications performed on capability of electrical systems to perform their safety functions and meet design requirements and commitments.
- 4.2.2 For modifications or changes to station batteries, confirm that adequate acceptance criteria and post-modification testing are incorporated in the related test procedures. Assure that logged test data for battery service tests includes corrections for minimum design temperature and that the test discharge current is corrected for average cell electrolyte temperature at the start of the test.
- 4.2.3 Review documentation substantiating modifications to the RHRSW and EECW systems to confirm that analyses are verified and completed in accordance with the requirements of ANSI N45.2.11.

4.3 Supplementary Reviews

- 4.3.1 Review voltage calculations to determine adequacy of electrical voltage at equipment terminals for design bases conditions.
- 4.3.2 Review the analyses establishing adequacy of electrical power sources, e.g., station batteries and standby diesel generator, including distribution system equipment and feeders.
- 4.3.3 Review analyses developed for coordination of electrical protective devices.
- 4.3.4 Review the selection of power sources, including separation requirements and availability.

- 4.3.5 Review equipment control design.
- 4.3.6 Review adequacy of equipment and system surveillance, maintenance, operating and emergency operating procedures. Interface with operation, surveillance, and testing inspectors to exchange inputs.
- 4.3.7 Review the analyses for selected motor operated valve substantiating the selected motor overcurrent and overload protection.

5.0 Instrumentation and Controls

5.1 Initial Review

- 5.1.1 Review FSAR sections, system evaluation reports, design criteria, flow diagrams, logic and control drawings, Technical Specifications, NSSS design and interface requirements and criteria to identify regulatory commitments and design requirements for instrumentation and controls in the RHRSW and EECW systems.
- 5.1.2 Review design documentation such as system design criteria, system evaluation reports, P&IDs, and instrument specifications to establish how the commitments were incorporated into the design. Evaluate the instrumentation used to support the items detailed in Section 1.3 (Mechanical Systems) of this inspection plan.
- 5.1.3 Review index of modification design changes to RHRSW and EECW systems and interfacing systems during recent outages to identify packages which should be inspected in detail. Prepare list of packages required for detailed inspection and submit to the TVA.
- 5.1.4 Review calculation index to identify calculations to be inspected in detail, e.g., setpoint calculations, instrument ranges, and loop impedances.
- 5.1.5 Develop questions as necessary to pose to TVA personnel for retrieval of required information and resolution of issues identified.

5.2 Review of Modifications

- 5.2.1 Review individual modification packages previously selected for inspection to determine the effect of modifications performed to instruments on capability of RHRSW and EECW and interfacing systems to meet established commitments and design requirements.
- 5.2.2 Review each modification package or design change to assure that the system capability has not been degraded relative

to established criteria and requirements and that channel separation is adequate including instrument locations, tubing and wiring.

- 5.2.3 Review the basis for setpoints established for modifications made to the RHRSW and EECW systems to confirm that setpoints are adequately documented and substantiated. This review will be conducted in conjunction with the mechanical portion of the inspection to assure that the bases for established setpoints is traceable to basic system design parameters. Confirm that potential reductions in design margin have been adequately addressed. Confirm that the basis for setpoints established is consistent with ISA-S67.04-1982 and that calculations are completed and verified in accordance with requirements of ANSI N45.2.11.
 - 5.2.4 Review related equipment qualification requirements and records for modifications made to RHRSW and EECW systems and interfacing systems to assure that equipment is environmentally qualified to perform its safety function for the design basis conditions specified.
 - 5.2.5 Perform a walkdown of the instrumentation for the RHRSW and EECW systems and interfacing system comparing the as-installed and as-built configuration with that reflected on design drawings, e.g., P&IDs, and other documents where necessary. For modifications to the RHRSW and EECW systems, determine that as-installed instrumentation and control configurations are consistent with design drawings and documents.
 - 5.2.6 Confirm that the modified design of the RHRSW and EECW and interfacing systems is consistent with requirements specified in Technical Specifications.
 - 5.2.7 Review modifications to confirm that the modified design for instrumentation and controls is consistent with the requirements of U. S. NRC Regulatory Guide 1.97.
- 5.3 Supplementary Reviews
- 5.3.1 Review the instrument index to assure that entries are accurate and up to date.
 - 5.3.2 Review the technical adequacy of calibration procedures for instrumentation and controls associated with RHRSW and EECW and interfacing systems.
 - 5.3.3 Review Q-List to confirm that entries are being accurately recorded. Confirm that safety-related and non-safety related, Q and non Q, components are correctly designated for modifications to the RHRSW and EECW systems.

6.0 Operations

6.1 Initial Review

- 6.1.1 Review FSAR sections, system design descriptions, and P&IDs related to the RHRSW and EECW and interfacing systems, e.g., raw cooling water and raw service water systems, diesel generator, vacuum priming system, and auxiliary electrical system for correlation of design and operating procedures.
- 6.1.2 Review Technical Specifications to identify operational requirements related to the safe operation of the RHRSW and EECW systems.
- 6.1.3 Review the procedures for normal and emergency operations of the RHRSW and EECW systems and their interfacing systems. Identify any areas of operational concern, such as inadequate guidance or weaknesses in providing positive instructions in emergency situations relative to proper operation of the RHRSW and EECW systems.
- 6.1.4 Review selected recent modification packages to assure that changes which affect RHRSW and EECW and interfacing systems operations have been adequately addressed in operating procedures.

6.2 Interaction with Plant Operations Personnel

- 6.2.1 Using the results of the above review as a basis, interview plant operations personnel to determine:
 - 6.2.1.1 the effectiveness of the operating procedures in providing adequate guidance to personnel for the proper operation of the RHRSW and EECW (and interfacing systems) in performing its safety functions;
 - 6.2.1.2 the adequacy of operator familiarity with normal and emergency procedures;
 - 6.2.1.3 whether actions required by operators and specified response times for these actions are reasonable for postulated accident conditions; and;
 - 6.2.1.4 whether adequate information is available through existing safety-related instrumentation to execute actions required by operating procedures.
- 6.2.2 Through additional interviews with operations staff, assess the adequacy of shift manning, control of work and operations, routine system status verification, and operator training. Assess the qualifications and capability of the operations staff based on their experience, education, and training.

- 6.2.3 Through interaction with other inspection team members, assist in the assessing of the operations staff and procedures used relative to the design intent for the original RHRSW and EECW system design bases.
- 6.2.4 Walkthrough operating procedures identified during initial review above with licensed operator(s) to identify any areas of weakness in the procedures. Concurrently, interview operating personnel to determine their opinions and input on these procedures relative to ease of performances and suggested changes which would improve weak areas.
- 6.2.5 During a walkdown of the RHRSW and EECW and interfacing systems, determine if components are labeled and accessible (can components be operated locally/manually if required?).
- 6.2.6 Determine if actual system lineups as tested duplicate required lineups for specific accident scenarios. Or, is a change in lineup required and provided for in the operating procedures?
- 6.2.7 Review night orders and tags.

6.3 Supplementary Reviews

- 6.3.1 Confirm that human factors considerations are adequately addressed in the implementation of operating procedures to assure that required actions can be reasonably executed using available instrumentation, controls, and accessible components specified in the procedures.
- 6.3.2 Review the operational experience of the RHRSW and EECW and interfacing systems, including Licensee Event Reports (LERs), Nuclear Plant Reliability Data System (NPRDS), 10CFR50.72 reports, enforcement actions, non-conformance reports, and maintenance work requests.

7.0 Surveillance and Testing

7.1 Initial Review

- 7.1.1 Review FSAR sections, design criteria, Technical Specifications for RHRSW and EECW and interfacing systems to identify requirements for surveillance and testing, particularly ISI and IST programs.
- 7.1.2 Review surveillance procedures for RHRSW and EECW and interfacing systems to assure that surveillance requirements (as identified in 7.1.1 above) are adequately implemented and reflect actual system and component functions and design intent.

- 7.1.3 Review surveillance procedures for RHRSW and EECW and interfacing systems to confirm that these systems and components are tested to demonstrate that they will perform their intended safety functions for all design bases conditions. For example, testing should demonstrate:
 - 7.1.3.1 capability of automatically supplying cooling water to equipment which must operate during an emergency shutdown;
 - 7.1.3.2 capability of automatically supplying cooling water to equipment required for normal operation in the case of failure of the primary source of cooling water;
 - 7.1.3.3 automatic initiation of RHRSW and EECW pumps assigned to EECW on receipt of an actuation signal.
- 7.1.4 Review trending completed on surveillance data by plant staff to determine if methods used ensure that degradation does not occur prior to next scheduled surveillance testing.
- 7.1.5 Identify selected modifications to the RHRSW and EECW and interfacing systems for review to assure that appropriate surveillance and post-modification testing has been incorporated as required.

7.2 Plant Staff Interactions

- 7.2.1 Walkthrough surveillance and test procedures with surveillance and test personnel to determine any weaknesses or procedures which may not be consistent with the design basis intent.
- 7.2.2 Interview surveillance personnel in conjunction with review of surveillance trending data to determine whether the root causes of failures have been aggressively pursued, identified, and corrected.

7.3 Supplementary Reviews

- 7.3.1 Review selected modification packages to confirm that post-modification testing has been provided where necessary to demonstrate that the modified design can perform its safety functions as required by the design bases.
- 7.3.2 Review actual inservice inspection and testing data logs to confirm that data is being correctly logged and accurately documented in accordance with surveillance procedures.
- 7.3.3 Review post-modification test procedures and actual post-modification testing data for testing conducted on the modified designs to confirm that:

- 7.3.3.1 accurate and appropriate acceptance criteria based on design bases documentation have been established and met;
- 7.3.3.2 procedures are technically adequate and reflect the design basis intent to assure the modified design can perform intended safety functions; and
- 7.3.3.3 data is accurately and correctly logged as required by test procedures.
- 7.3.4 Review modifications to RHRSW and EECW systems to identify surveillance inspection and test requirements to be implemented on modified design. Confirm that provisions have been made to incorporate these requirements into appropriate procedures and scheduled IST and ISI.
- 7.3.5 Review surveillance procedures to determine the adequacy of inservice testing of RHRSW and EECW pumps and valves in accordance with ASME Section XI requirements. Confirm that adequate acceptance criteria are specified and that they are consistent with design bases requirements (review in conjunction with mechanical portion of inspection).

3.0 Maintenance/Modifications

8.1 Initial Review

- 8.1.1 Review FSAR sections, system design descriptions, and maintenance program documentation provided to identify maintenance commitments for the RHRSW and EECW and interfacing systems.
- 8.1.2 Identify maintenance related documentation to be reviewed, e.g., maintenance procedures, work requests, and post-maintenance test procedures.

8.2 Plant Staff Interactions

- 8.2.1 Walkthrough selected RHRSW/EECW maintenance and maintenance test procedures with maintenance staff personnel to identify weaknesses and inconsistencies with the design intent for the component or system function.
- 8.2.2 Interview maintenance staff personnel to determine technical adequacy of maintenance instructions provided in maintenance procedures. Identify extent of maintenance instructions left to technician's capability in "skill of trade".

8.3 Modifications

- 8.3.1 Review selected modifications to RHRSW/EECW for maintenance-related requirements, post-maintenance testing, etc. Confirm that provisions have been made to incorporate