TENNESSEE VALLEY AUTHORITY
WELDING PROJECT

PROGRAM DESCRIPTION

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ENCLOSURE 1

TVA WELDING PROJECT PROGRAM DESCRIPTION

TABLE OF CONTENTS

TENNESSEE VALLEY AUTHORITY
WELDING PROJECT

I. INTRODUCTION

During the course of TVA's construction work on its nuclear plants, conditions involving the welding program have been identified which did not meet industry and/or regulatory standards. These conditions were identified by quality indicators such as nonconformance reports, audit findings, NRC inspections, etc. These conditions were evaluated and dispositioned. Although issues related to welding continued to be identified, it was TVA's belief that the overall welding program was acceptable.

Recently, a number of specific and general allegations/concerns have been made regarding the adequacy of TVA's welding program (reinspection of welds through carbozinc primer, welder recertification, etc.). On October 29, 1985, the NRC, in a letter requesting a meeting with TVA to discuss welding program concerns, supplied a listing of correspondence on TVA welding issues with a number of questions and comments. In addition, the Employee Concern Program instituted at Watts Bar has brought out additional questions from TVA employees as to the adequacy of TVA's conduct in performing welding activities.

After assessing the above issues, TVA concluded that additional reviews were needed to determine the adequacy of the overall TVA welding program and TVA weldments. As a result a Power and Engineering (Nuclear) Welding Project has been formed within the Office of

Engineering to resolve these issues and to determine the actions to be taken to ensure that future welding activities are in accordance with TVA commitments.

Employee Concerns on vendor welds are not included in the scope of Welding Project activities. The individual concerns will be evaluated in accordance with the Employee Concerns Program.

To accomplish this task, the Welding Project will receive input from all TVA initiated actions (which are discussed in detail below) involving both TVA personnel and outside consultants such as Bechtel, APTECH Engineering, Quality Technology Corporation (QTC), and the Department of Energy (DOE), and will evaluate the overall welding program from definition through implementation. Two separate work phases will be performed at each TVA nuclear plant which involve: (1) ensure that the written TVA welding program (design documents, policies, and procedures) now in place correctly reflects TVA's commitments and regulatory requirements, and to identify and categorize concerns/deficiencies in the program; and (2) evaluate the implementation of the written welding program; verify the weldments made by TVA in the field meet commitments and requirements or are adequate for service; correct any problems, and implement any changes to prevent recurrence. The role of each outside consultant in the separate work phases is described later in this submittal. However, it should be noted that the findings and recommendations of the outside contractors are channeled into the Welding Project for review and

consideration. The Welding Project is responsible for assessing all information provided from these sources and making the final determination as to the adequacy of TVA's welding program. A functional organizational chart depicting these interfaces is shown in figure 1.

II. CHARTER AND ORGANIZATION

The Welding Project has the responsibility to verify that welds in structures, piping systems, components and features which are currently in place at TVA's nuclear plants are adequate to meet TVA commitments, code and regulatory requirements. The Welding Project is to examine organizational welding programs, determine and ensure implementation of any remedial actions that may be needed, and to take those actions deemed necessary in order to ensure that future welding activities are in accordance with TVA's commitment to excellence in its nuclear program. The project charter and plant priority are shown in figure 2.

The project encompasses TVA organizations and is staffed with engineering, constructing, and operating organizations' personnel. The Welding Project organizational chart is shown in figure 3. In addition to the personnel specifically identified on the organization chart, the Project can draw upon the total TVA staff in Engineering, Construction, and Operations. Several millions of dollars have been budgeted, in addition to the millions budgeted for the Nuclear Safety Review Staff

(NSRS), Employee Concerns, and the DOE-Weld Evaluation Project (DOE-WEP) which provide input to the Welding Project (see figure 4).

The work of the Welding Project will be accomplished in two phases.

- The purposes of Phase I are to ensure that the written TVA welding program (design documents, policies, and procedures) now in place correctly reflects TVA's commitments and regulatory requirements, and to identify and categorize concerns/deficiencies in the program.

- The purposes of Phase II are to evaluate the implementation of the written welding program; verify that weldments made by TVA in the field meet requirements or are adequate for service; correct any problems, and implement changes to prevent recurrence.

The purposes of Phase I and Phase II are shown in figure 5.

III. PHASE I ACTION PLAN

The implementation of Phase I is broken down into five action steps as shown on figure 6.

1. Review TVA commitments to NRC

2. Verify that written program reflects commitments

   o Determine that welding related commitments are reflected in design output

   o Determine that Construction and Nuclear Operations programs as applicable reflect design output and quality requirements

3. Assemble welding program quality indicators (including employee welding concerns) by type and plant

4. Analyze and evaluate effect of quality indicators on programs

5. Issue adequacy statement regarding written programs to implement/control welding

Reports will be issued to reflect the evaluation and corrective action required. Phase I evaluation was completed for SQN on January 15, 1986, and will be completed for WBN by February 15, 1986, and for BFN and BLN by March 15, 1986. The SQN Phase I report is scheduled for submittal January 29, 1986. The other Phase I report dates are not established.

The work plans describing how action steps 1, and 2, are accomplished are contained in Attachments 1A, 1B, and 1C to this program description. The Phase I activities are primarily home office actions with input from Construction and Operations sites, and from the Employee Concern Programs at sites.

Action Step 3 is being accomplished by retrieving the various Engineering, Construction and Nuclear Operations quality records (NCRs, CARs, audit reports, NRC communications, etc.) from project files. This is a major effort coordinated by the Construction Organization. Thousands of documents are being assembled. These historic construction phase and operation phase (for operating plants) quality indicators are also in a computer program capable of various sorts.

All the welding related Employee Concerns, as reported through the Employee Concerns Program and provided by NSRS to the Welding Project, are being categorized for specific concerns and potential generic implications related to welding. All concerns specific to operating plants and all concerns with generic implications are being reviewed by Nuclear Operations. As of the first week in January, 1986, approximately 400 employee concerns had been reviewed.

Action Step 4 is an analytical process conducted by the Welding Project Engineers and their staffs. After reviewing the quality indicators including employee welding concerns, the quality indicators are grouped into problem categories for use in program evaluation. Because each Employee Concern may have more than one inference, it may subsequently be categorized, evaluated and analyzed in a number of ways. This assures that even one Employee Concern on an issue will be addressed for its inferences. The nonspecific concerns without objective evidence are also considered for generic implications. In these efforts project personnel are aided by having all concerns in a

computer program which may be sorted in a variety of ways. The concerns are also being reviewed in aggregate so that a number of expressions on a single issue can be accumulated and addressed.

Followup meetings with QTC and DOE-WEP (the principal contractor is EG&G) are being held to develop additional specific data regarding the concerns, and to discuss the concerns and the perception of these concerns held by QTC and DOE-WEP personnel.

Welding Project personnel will analyze the above data and use it to review more critically the welding program which is in place for Engineering, Construction and Operations in relation to commitments and requirements. This analytical process will also use the data in looking for improvements, to make the existing welding programs easier to use, less prone to human errors, more simple and trouble free, to increase the overall rate of acceptable welding, and to reduce the problems reported on NCRs and CARs related to welding.

Data regarding historic quality indicators and Employee Concerns will be made available to sharpen the focus of the independent implementation audits in Welding Project Phase II, Part 1, and this data will be used by the Welding Project to evaluate the need for hardware reinspections as part of Phase II, Part 2.

Action Step 5 is to issue a statement regarding the adequacy of the written welding programs to control welding. The Welding Project will critique programs and procedures, and the overall TVA program. The

Welding Project will issue the adequacy statement indicating areas of non-compliance, if any, and areas where improvements are needed or possible. Where improvements are identified, the Welding Project will verify implementation of these actions as part of Phase II.

The Welding Project evaluation in this area is ongoing, and open to receive new data and concerns. Even when Phase I is nominally complete for a site, subsequent data received will be factored in and evaluated for specific and generic implications.

IV. PHASE II ACTION PLAN

The implementation of Phase II is broken down into two parts and is summarized in figure 6. Most of the Phase II action is at Construction and Operations sites with management and analysis in the home office. The first two action items, auditing and evaluating the need for reinspections, are in Part 1. The reinspections and corrective actions are in Part 2; however, corrective actions will occur wherever appropriate in Phase I and Phase II.

PART 1 - INDEPENDENT AUDITS

The first part of the Phase II program is to verify that the welding program reviewed in Phase I has been and is being implemented effectively at SQN, BFN, and BLN sites. The audits at SQN, BFN, & BLN

will be indepth, approximately four weeks in duration. These project site audits will track the welding program from engineering package through completed record package. This auditing will cover ASME, non ASME, and AWS safety related applications and will be conducted by Bechtel. The independent audit will be led by a qualified Audit Team Leader, with four qualified auditors with supplementary expertise such as SNT TC-1A Level III personnel, welding engineers/metallurgists, or Certified Welding Inspectors as appropriate.

The audit will be structured so that the auditors will look at items such as:

- o implementation of technical and welding program requirements
- o adequacy of design output documents (are the drawings and specification easily understandable and useable)
- o initial welder or welding operator qualifications
- o maintenance of welder or welding operator qualifications
- o renewal of welder or welding operator qualifications
- o initial welding inspection personnel qualifications
- o maintenance of welding inspection personnel qualifications
- o renewal of welding inspection personnel qualifications
- o use of appropriate welding procedures
- o use of appropriate inspection procedures
- o use of appropriately trained and qualified personnel
- o quality, use and control of welding filler materials

- o inprocess control of welding
- o documentation of the above activities
- o nonconformances and corrective actions
- o training programs adequacy
- o additional areas of concern as determined by a review of employee concerns

The auditors have complete freedom to pursue any and all issues related to welding program implementation which they determine appropriate. The Welding Project has only established minimum guidelines. The Welding Project may request audits of specific items based on quality indicators or concerns.

The Welding Project will review the findings of these audits for specific problems and programmatic implications. Site specific findings will be referred to the appropriate organization for disposition. The TVA audit work plan is described in Attachment 2 to this Program Description.

At Watts Bar a weld evaluation program which includes reinspections is being conducted by DOE-WEP, as contracted by NSRS that will accomplish Phase II. The results of the DOE-WEP inspection will be made available to the Welding Project. The organization and methodology of that effort are described in Enclosure 3. The Welding Project may expand upon DOE-WEP efforts.

As part of Phase II the Welding Project will review, evaluate, and take appropriate action on DOE-WEP produced WBN data. A chart showing the interaction between the Employee Concern Program, NSRS, QTC, DOE-WEP and the Welding Project (Phase II) is shown in figure 4. The specific flow of data shown in figure 4 is supplemented by meetings described in Phase I of this program to obtain the QTC and DOE-WEP perceptions of the concerns. All of this data will be evaluated to determine the need for sample reinspections, or a 100% reinspection on some specific population identified.

The results of the Phase I action steps, employee concerns and the first part of Phase II, and the independent audit at the project sites, will be utilized to determine the need for additional reinspections of welds at SQN, BFN, and BLN. Findings with generic implications at any site will be evaluated for applicability to the other sites. The evaluation of the commitments, program reflecting those commitments, the "quality indicators" (including employee concerns) and the effectiveness of implementation of the program as determined by independent audit will allow the TVA Welding Project to determine where additional reinspection of welds is required to verify that each plant is fit for service. For plants under construction, fit for service refers only to the as-built portion of the plant.

PART 2 - [redacted]

When reinspections are determined to be necessary, these will be performed in Phase II, Part 2. Reinspection of TVA welds will be conducted to determine compliance with program commitments or suitability for service. Welds to be reinspected will be determined based on results from Phase I, and Phase II, Part 1, as described above.

The acceptance criteria to be used for the reinspections will be appropriate for each type component. The acceptance criteria are summarized in figure 7. Where reinspection activities are not performed on a 100% basis, sampling will be utilized. The sampling basis is to be NCIG-02 when statistical sampling is warranted. If other sampling methods are used for reinspections, these will be addressed in a work plan which will be submitted to the NRC for approval. Coatings will be removed for reinspections except where the attribute being evaluated is such that coatings will not affect the examination. For example, if the employee concerns are related to the attributes of the length, size, and location of welds, coatings will not be removed.

The results of all program reviews, independent audits, and any weld reinspection at any plant will be utilized by the Welding Project in determining whether requirements have been met or weldments are adequate for service.

As part of Phase II, Part 2, the Welding Project will implement appropriate corrective actions in two ways: corrective actions will be initiated by the Welding Project; programmatic and site specific actions will be implemented by the appropriate organizations in accordance with quality programs. The corrective actions may be hardware related or program related. As noted previously, the Welding Project will verify the adequacy of implementation of corrective action.

WELDING PROJECT FUNCTIONAL ORGANIZATION

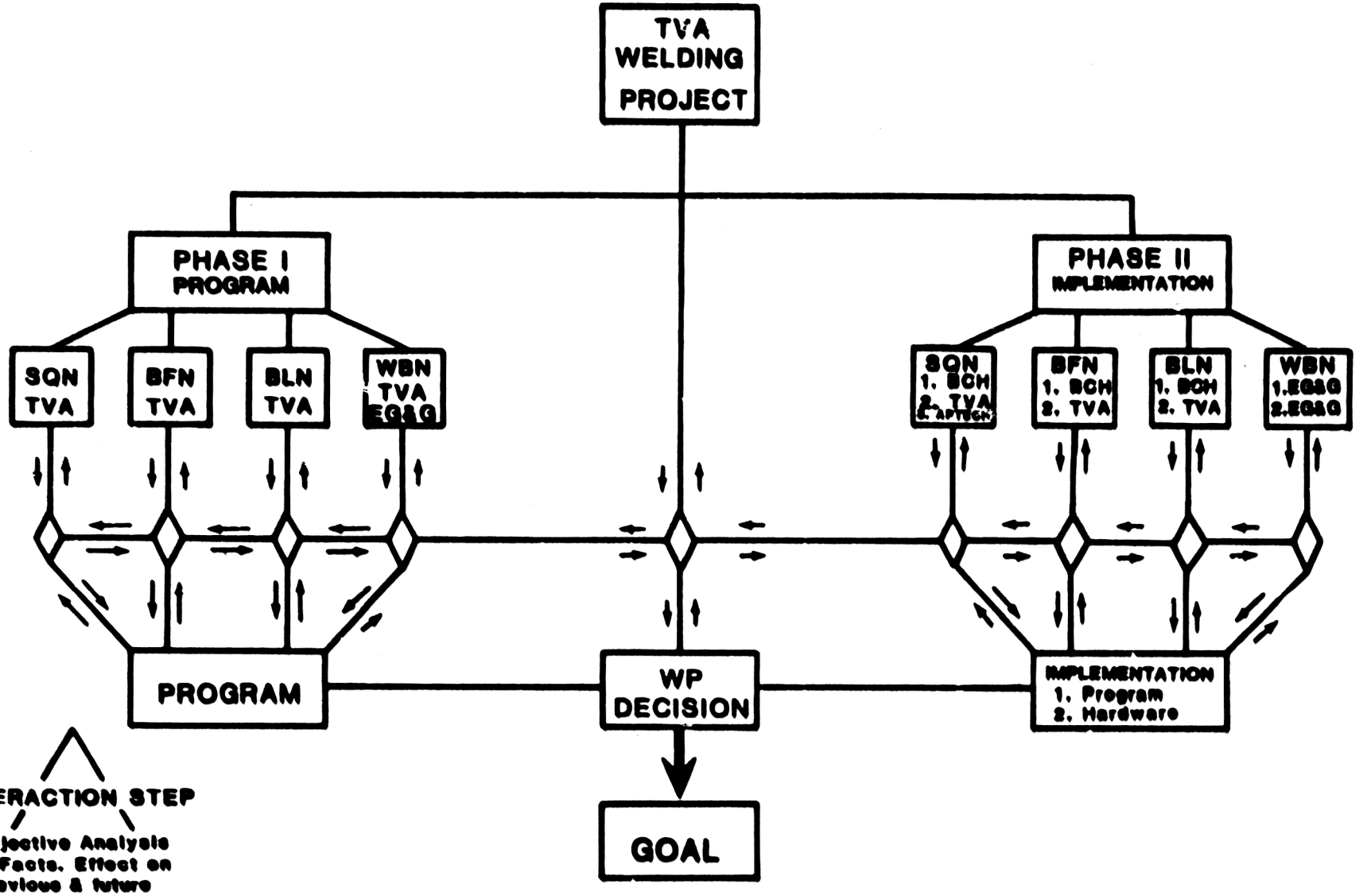


FIGURE 1

INTERACTION STEP

Objective Analysis of Facts. Effect on previous & future objectives & decisions. Includes OTC & TVA Employee Concerns Program Input

GOAL ➧ Program = Commitment = As Built / Implementation

WELDING PROJECT CHARTER

EXAMINE THE ORGANIZATIONAL WELDING PROGRAMS IN TVA, DETERMINE ANY REMEDIAL ACTIONS THAT MAY BE NEEDED, AND TAKE THOSE ACTIONS NECESSARY TO ASSURE THAT FUTURE TVA PERFORMED WELDING ACTIVITIES ARE IN ACCORD WITH TVA'S COMMITMENT TO EXCELLENCE IN ITS NUCLEAR PROGRAM.

VERIFY THAT THE TVA PERFORMED WELDING OF STRUCTURES, PIPING SYSTEMS, AND OTHER SAFETY-RELATED PLANT COMPONENTS, WHICH ARE CURRENTLY IN PLACE AT TVA'S NUCLEAR PLANTS ARE ADEQUATE TO MEET TVA, CODE, AND REGULATORY REQUIREMENTS.

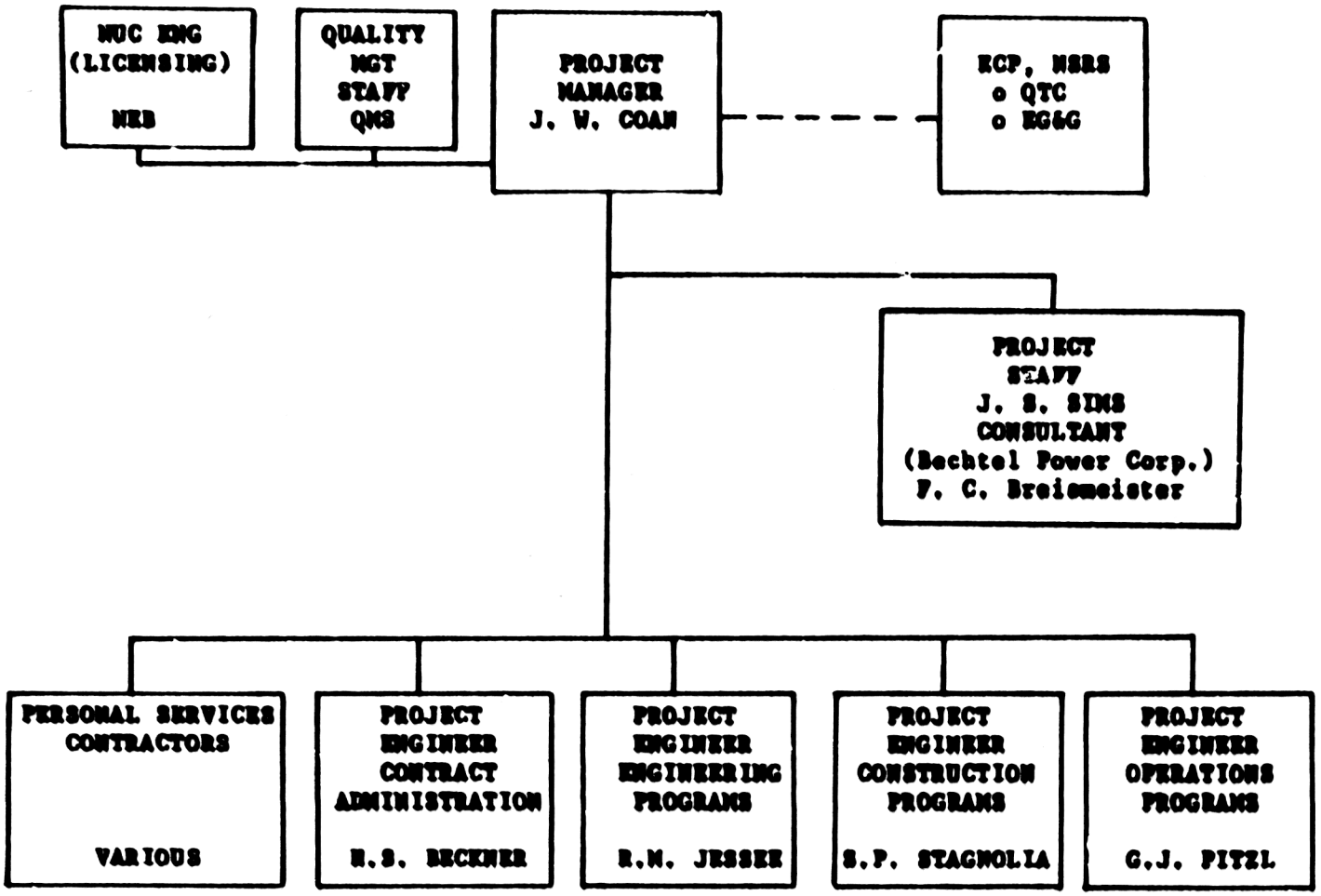
THE PRIORITY WILL BE AS FOLLOWS:

1. SEQUOYAH
2. WATTS BAR
3. BROWNS FERRY
4. BELLEFONTE

FIGURE 2

095340.06

WELDING PROJECT



095340.02

Figure 3 - Project Organization

ORGANIZATIONAL INTERFACES & FLOWCHART WELDING PROJECT & E.G.&G.-IDAHO AT WBN

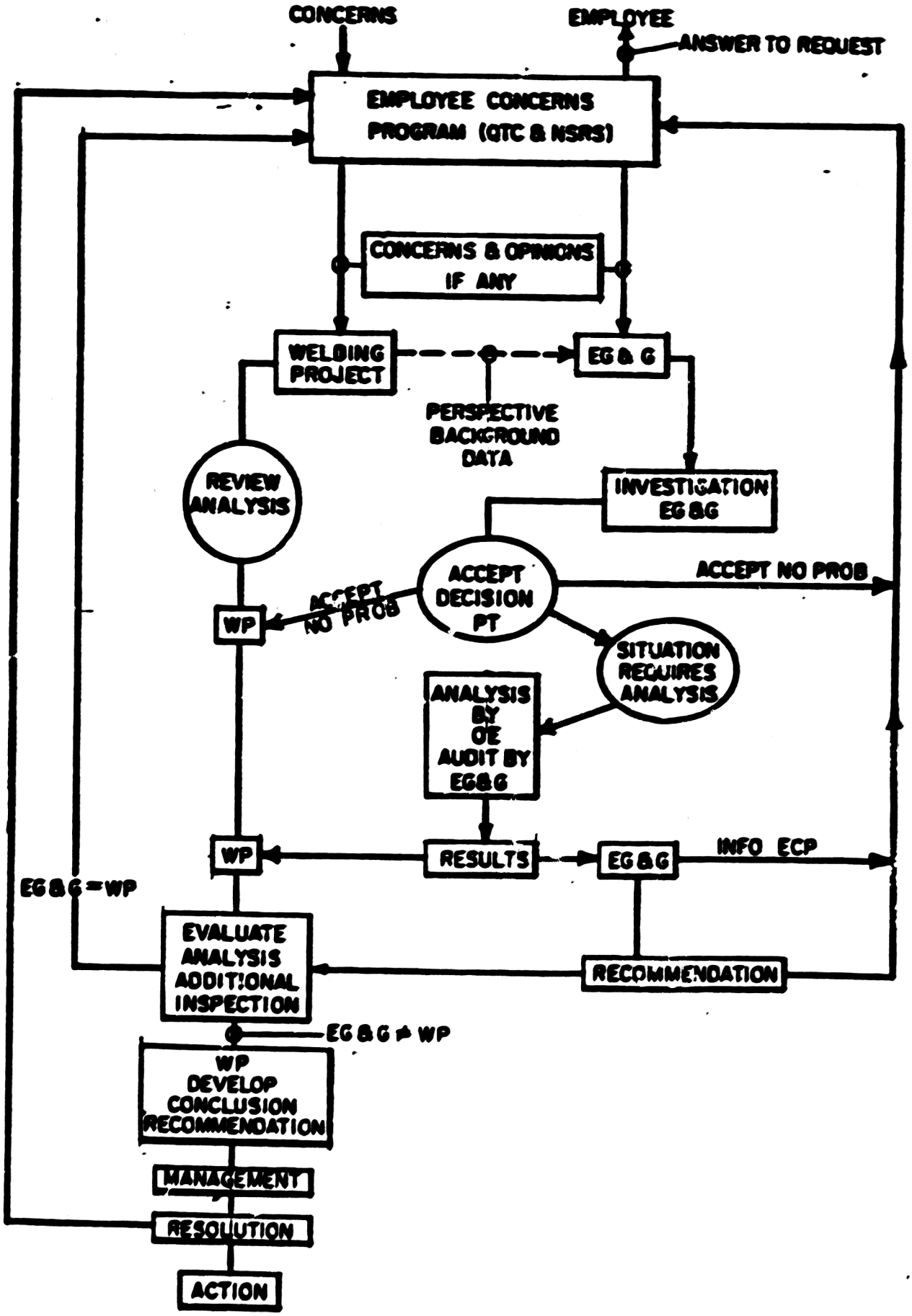


Figure 4

PURPOSE

PHASE I

THE PRIMARY PURPOSES OF PHASE I ARE TO ENSURE THAT THE TVA PROGRAM, DESIGN DOCUMENTS, POLICIES AND PROCEDURES CORRECTLY REFLECT TVA COMMITMENTS AND REGULATORY REQUIREMENTS AND TO IDENTIFY AND CATEGORIZE CONCERNS/ DEFICIENCIES IN THE WELDING PROGRAM.

PHASE II

THE PRIMARY PURPOSES OF PHASE II ARE TO:

- EVALUATE THE IMPLEMENTATION OF PROCEDURES
- VERIFY THAT INSTALLED WELDMENTS MEET REQUIREMENTS OR ARE ADEQUATE FOR SERVICE
- CORRECT ANY PROBLEMS, IMPLEMENT CHANGES TO PREVENT RECURRENCE

FIGURE 5 - PURPOSES PHASE I AND PHASE II

ACTION PLAN

PHASE I

1. REVIEW TVA COMMITMENTS TO NRC

2. VERIFY THAT WRITTEN PROGRAM REFLECTS COMMITMENTS

3. ASSEMBLE QUALITY INDICATORS OF "WELDING CONCERNS" BY TYPE AND PLANT

4. TREND AND EVALUATE EFFECT OF "QUALITY INDICATORS" ON PROGRAMS

5. ISSUE ADEQUACY STATEMENT REGARDING WRITTEN PROGRAMS TO IMPLEMENT/ CONTROL WELDING

PHASE II

1. PERFORM WELDING PROGRAM IMPLEMENTATION AUDIT
   - CONSTRUCTION PROGRAM IMPLEMENTATION
   - OPERATIONS PROGRAM IMPLEMENTATION

2. EVALUATE NEED FOR ADDITIONAL REINSPECTIONS

3. IMPLEMENT ANY ADDITIONAL REINSPECTIONS AND DEFICIENCY RESOLUTIONS (BOTH INDIVIDUAL AND GENERIC CASES)

4. WELDING PROJECT WILL ISSUE FINAL REPORTS, EACH PLANT

FIGURE 6 - ACTION PLAN

096002.02

REINSPECTION ACCEPTANCE CRITERIA

TYPE COMPONENT		CRITERIA
STRUCTURAL STEEL		NCIG-01
SUPPORT STEEL	NON-ASME STAMPED	NCIG-01
SUPPORT STEEL	ASME NF STAMPED	ASME III, NF AND CODE CASES
ASME PIPING		ASME III *
ANSI B31.7		ANSI B31.7 *
ANSI B31.1		ANSI B31.1
ASME SECTION XI PIPE AND SUPPORTS		ASME XI

* ASME SECTION XI MAY BE USED FOR SYSTEMS WHICH HAVE BEEN HYDRO TESTED AND STAMPED ON A CASE BASIS. ASME SECTION XI IS THE APPROPRIATE CODE FOR SUCH WORK.

FIGURE 7

095361.01

ENCLOSURE 1
WELDING PROJECT PROGRAM DESCRIPTION
ATTACHMENT 1A
WELDING PROJECT - PHASE I, STEPS 1 AND 2
NUCLEAR OPERATIONS WORK PLAN

ATTACHMENT 1A

Welding Project - Phase I, Steps 1 and 2

Nuclear Operations Work Plan

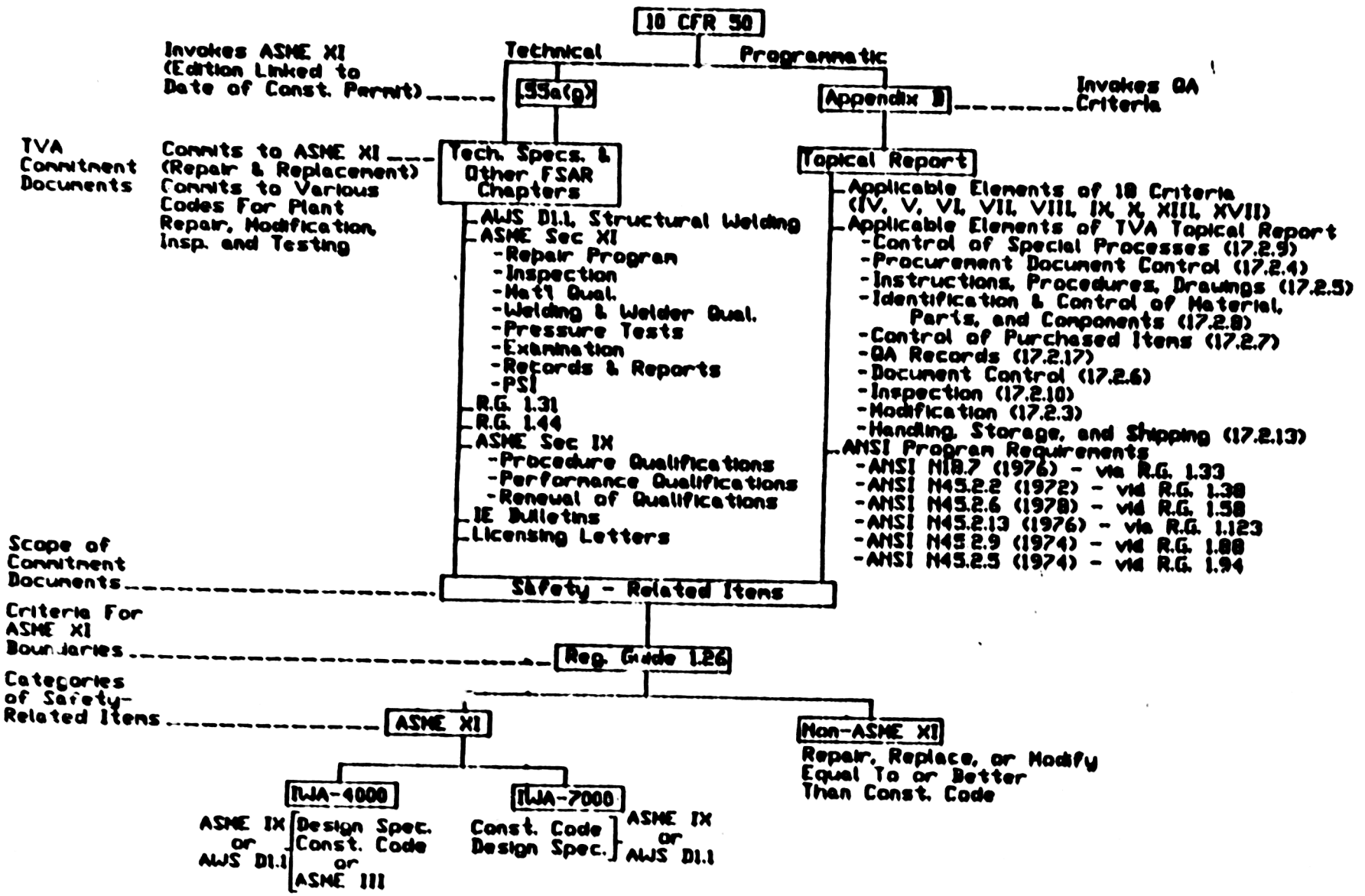
To accomplish Phase I action steps 1 and 2, the Welding Project will identify all welding requirements of the current Nuclear Operations welding program through a review of an assortment of source documents all of which emanate from the Code of Federal Regulations. A Welding Requirements Commitment Summary will be prepared for each plant which lists these documents, some of which invoke programmatic requirements while others invoke technical requirements. An example of this summary for Sequoyah is shown in Attachment I of this Plan. Once all source documents have been identified, the Welding Project will prepare tables to correlate source document welding requirements (programmatic and technical) to the applicable corporate level and site level implementing procedures and instructions. Where source documents impose multiple requirements (i.e., the requirements apply to more than welding-related activities or to some activities which are not welding related), applicability to the welding program will be specified.

The applicable corporate and site level procedures and instructions will be reviewed to ensure conformance to source document requirements. Assessments will be made to determine if applicable implementing procedures conform fully to the source documents or are deficient or need improvement. Recommended corrective action will be included for both deficiencies and areas for improvement. Assessments will be summarized in

welding requirements implementation matrix packages for each source document requirement. A sample matrix package for Sequoyah is shown in Attachment II. Deficiencies/recommendations will be submitted to the Project Manager of the Welding Project for consideration and transmittal to the responsible organization. The responsible organization will be required to respond to each deficiency/recommendation.

ATTACHMENT I

NUCLEAR OPERATIONS COMMITMENT SUMMARY
--- WELDING ---



ATTACHMENT II

Welding Requirements Implementation Matrix

Requirement Area: Document Control

Prepared By: D. F. Jaquith

Date: December 23, 1985

Requirement Area: Document Control

Applicability to the Welding Program:

Control of welding, heat treatment, and NDE procedures; and implementing procedures which require welding, heat treatment and NDE.

Assessment Summary:

The requirements for document control as they apply to the welding program are considered to be adequately implemented by procedures and instructions.

DFJ:KC
1/1/86
0083K

WELDING REQUIREMENTS IMPLEMENTATION MATRIX

PLANT Sequoyah

Date 12-23-85

SOURCE DOCUMENTS/REQUIREMENTS	IMPLEMENTING DOCUMENTS		
	NQAM	DPM/ PROGRAM PROCEDURE	PLANT STANDARD PRACTICE/ ADMINISTRATIVE INSTRUCTION
10 CFR 50, Appendix B VI. DOCUMENT CONTROL Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality. These measures shall assure that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed. Changes to documents shall be reviewed and approved by the same organizations that performed the original review and approval unless the applicant designates another responsible organization.	III, 1.1 (Document Control - 3-21-85)	DPM N73M2 (Welding Procedures - 12-20-85) PMP 1502.07 (NDE Procedures-1-18-85) (Formerly DPM N80E3)	SQA1 (R10) (System of Standard Practices) AI-4 (R50) (Document Control) M&AI-1 (R9) (Control of Weld Documentation) TI-51 (R29) (NDE Procedures) SQM17 (R2) (Welding Procedures) AI-19, Part IV (R12) (Plant Modifications) AI-25, Part 1, (R11) (Drawing Control)

ATTACHMENT II

WELDING REQUIREMENTS IMPLEMENTATION MATRIX

PLANT Sequoyah

Date 12-23-85

SOURCE DOCUMENTS/REQUIREMENTS	IMPLEMENTING DOCUMENTS		
	NOAM	DPM/ PROGRAM PROCEDURE	PLANT STANDARD PRACTICE/ ADMINISTRATIVE INSTRUCTION
Topical Report (TVA-TR75-1A) [illegible] [illegible] [illegible] [illegible] [illegible] ⋮	III, 1.1 (Document Control - 3-21-85) II, 6.1 (Welding, 10-12-85)	DPM N73M2 (Welding Procedures - 12-20-85) PMP 1502.07 (NDE Procedures - 1-18-85) (Formerly DPM N80E3)	SQA1 (R10) (System of Standard Practices) AI-4 (R50) (Document Control) M&AI-1 (R9) (Control of Weld Documentation) TI-51 (R29) (NDE Procedures) SQM17 (R2) (Welding Procedures) AI-19, Part IV (R12) (Plant Modifications) AI-25, Part I, (R11) (Drawing Control)

ATTACHMENT II

ENCLOSURE 1
WELDING PROJECT PROGRAM DESCRIPTION
ATTACHMENT 1B
WELDING PROJECT - PHASE I STEPS 1 AND 2 - OFFICE OF ENGINEERING WORK PLAN

WELDING PROJECT - PHASE I, STEPS 1 AND 2 - OFFICE OF ENGINEERING WORK PLAN
WELDING PROJECT VERIFICATION PROCEDURE AND DOCUMENTATION

1.0 PURPOSE AND SCOPE

This statement describes the method used to verify that welding related commitments are reflected in OE output documents. The verification process will review a large number of mechanical and a large number of civil scope commitments to provide confidence that requirements are addressed on OE output drawings and specifications.

2.0 PROCEDURE

Auditing type techniques necessary to establish a high confidence level will be applied to this work scope.

2.1 OE Phase I - Implementation Steps 1 & 2

Mechanical and civil disciplines will perform reviews within their respective areas of responsibilities. In addition, electrical commitments will be handled by the civil discipline except for I&C which will be handled by the mechanical discipline.

Establish welding-related commitments made on each plant.

2.1.1 Review each plant FSAR to identify welding commitments.

2.1.2 Determine if commitments have been incorporated into design output documents for each plant.

2.1.2.1 Identify relevant statements contained in the final safety analysis report (FSAR) and compare these with the actual design as reflected in various design documents, such as design criteria, engineering change notices (ECNs), plant specifications (G Specs), etc., and documents the results of the review/evaluation.

2.1.2.2 OE FSAR Commitment Consistency Review

a. Review the FSAR to identify statements discussing welding commitments. Verify that the design process correctly reflects commitments in output documents.

b. Using Attachment A (FSAR/Commitment Review Form), assigns a unique number to each statement identified (e.g., CEB-001); enters the number on FSAR/Commitment Review form (block 1).

c. Enters on the FSAR/Commitment Review form

(blocks 4 and 5) the statement's FSAR section or document name and page number.

d. Review the selected statements for consistency with an issued applicable design document or implementing procedure related to that plant's design.

e. Complete the FSAR/Commitment Review form blocks 2, 3, and 6 through 9 as specified below.

(2) Determine the responsible group/section, enters it on FSAR/Commitment review form (block 2) and assigns the statement to the group/section to verify the consistency with design and implementing documents.

(3) Copy design statement in its entirety.

(6) List the design documents which are the basis for the FSAR/Commitment statements and/or the design documents reviewed to determine consistency (block 6).

(7) List the person(s) who verified the consistency of the statement if other than the investigator (block 7).

(8) Determine if the FSAR/Commitment description of the design is consistent with the actual design documentation. If the FSAR/Commitment is consistent with the design documentation, mark "Design documents and FSAR/Commitment consistent." If minor inconsistencies exist (e.g., differences in nomenclature) which do not result in a misrepresentation of the design, mark "minor inconsistencies between FSAR/Commitment and Design Documents," and add under "Discussion on Findings" what the inconsistencies are. If significant inconsistencies or numerous minor inconsistencies exist, such that a misinterpretation of the design is likely, mark "FSAR/Commitment is not consistent with Design Documents," and add under "Discussion of Findings" what the inconsistencies are and implements the requirements of Office of Engineering Procedure 17 as applicable; such as the issuance of the Problem Identification Report (PIR) or Significant Condition

Report (SCR)

(9) The FSAR/Commitment Consistency Review Form (Attachment B) is to be completed by the investigator or reviewer to provide additional information and recommended program improvement. This shall be submitted when the findings of the FSAR is not consistent with design documents. It is requested to be completed when minor inconsistencies exist. It may be completed to suggest improvements when design and FSAR are consistent.

f. Review the most frequently used welding and all required NDE procedures to their related scope. Provide a listing of procedures reviewed and signature of reviewer.

g. Investigator and approver sign and date the form.

h. Assemble documentation package.
Review the documentation packages to determine deficiencies/recommendations. Deficiencies/recommendations will be submitted to the Project Manager of the Welding Project for consideration and transmittal to responsible organizations. The responsible organization will be required to respond to each deficiency/recommendation.

ATTACHMENT A

_____ - FSAR/COMMITMENT CONSISTENCY REVIEW FORM - 1985
Plant

(1) Design Statement No.

(2) Responsible Group/Section _____

(3) Design Statement as Presented in FSAR _____

(4) FSAR Section _____

(5) FSAR Page _____

(6) Design Documents

(7) Contact(s) _____

(8) DISPOSITION OF STATEMENT

Design Documents and FSAR Consistent	Minor Inconsistencies Between FSAR and Design Documents	FSAR is not Consistent with Design Documents

(9) DISCUSSION OF FINDING

_____

_____

_____

_____

Coordinating Initials	Investigator	Date	Approver	Date
_____	_____	_____	_____	_____

ATTACHMENT B

_____
Plant

FSAR/COMMITMENT CONSISTENCY REVIEW FORM

INCONSISTENCY (describe)

SUGGESTION FOR IMPROVEMENT OF PROGRAM (describe)

CHANGES TO MAKE PROGRAM WORK PROPERLY (describe)

ENCLOSURE 1
WELDING PROJECT PROGRAM DESCRIPTION
ATTACHMENT 1C
WELDING PROJECT - PHASE I, STEPS 1 AND 2 - OFFICE OF CONSTRUCTION WORK PLAN

WELDING PROJECT - PHASE I, STEPS 1 AND 2 - OFFICE OF CONSTRUCTION WORK PLAN

COMMITMENT IDENTIFICATION AND PROGRAM IMPLEMENTATION

The methods by which OC accomplishes Phase I action steps 1 and 2 for plants under construction are as follows:

The Office of Construction (OC) Project Engineer for the Welding Project will evaluate the implementation of welding related commitments in site procedures. The following documents have been identified as potential sources of commitments:

1. Final Safety Analysis Report (FSAR)
2. Quality Assurance Manual for ASME Section III Nuclear Power Plant Components (NCM)
3. Nuclear Quality Assurance Manual (NQAM)
4. General Construction Specifications
5. Project Construction Specifications

6. Regulatory Guides
7. OC Quality Assurance Program Manual (OC QAPM)
8. OC Quality Training Program Manual (OC QTPM)
9. Responses to NRC Violations and 50.55(e) Items

Identified requirements will be compared to the site-level implementing procedures to determine overall procedural adequacy. Deficiencies/ recommendations will be submitted to the Project Manager of the Welding Project for consideration and transmittal to the responsible organization. The responsible organization will be required to respond to each deficiency/recommendation.

A review of the FSARs indicate that a number of industry standards and Regulatory Guides are referenced. These documents contain specific commitments that are to be addressed by this review.

Many of the commitments identified by reviewing the FSAR are referral documents and, as such, will receive only a cursory review. In addition, some of the documents are translated by the Office of Engineering into G-29C, E, or M: ANSI B31.1, ANSI B31.7, ASME Boiler and Pressure Vessel Code, AWS D1.1, AWS D12.1, Regulatory Guide 1.31, Southern Standard Building Code, and Uniform Building Code. OC will not review any of the documents translated by OE.

Other documents called out by the FSAR include ANSI standards with their endorsing Regulatory Guides and ASNT-TC-1A. ANSI N45.2.5, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of

Nuclear Power Plants"; N45.2.6, "Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants"; and N45.2.8, "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants," and have been determined to be the only welding-related quality standards committed to. These documents will be fully reviewed to identify potential inadequacies and areas for improvement.

The NCM contains the programmatic requirements mandated by the ASME Code. It will be reviewed in detail to identify inadequacies. The NQAM, however, contains only general statements which cross-reference the user to other documents. This manual will receive a cursory review to assure that the cross-reference will be evaluated elsewhere.

The General Construction Specifications and the Project Construction Specifications will be reviewed to identify the documents which have welding-related requirements. The following will be reviewed in detail: G-29C, G-29E, G-29M, N3G-101, N3M-868, N3G-881, N3C-884, N4G-102, N4M-870, N4C-871, and N4G-889.

Regulatory Guides other than those endorsing ANSI N45.2XX standards were also considered. The guides considered to be potential sources of welding-related commitments are 1.43, "Control of Stainless Steel Weld Cladding of Low-Alloy Steel Components"; 1.44, "Control of the Use of Sensitized Stainless Steel"; 1.50, "Control of Preheat Temperatures for Welding of Low-Alloy Steel," and 1.71, "Welder Qualification for Areas of Limited Access." OE provides an interpretation of these documents and applicable

commitments have been conveyed to QC in either a General or Project Specification. Therefore, QC will not review these Regulatory Guides.

The QC QAPM contains one detailed welding-related technical procedure. There are also some general program requirements which will be reviewed against site procedures. The QC QTPM contains the detailed qualification/certification criteria from ASME, ASNT, and AWS. The QC QTPM translates the upper-tier requirements for use at the site. The QC QTPM will be reviewed against upper-tier documents, and site procedures will be revicved against the QC QTPM.

Additional commitments exist in the responses to NRC violations and in the final reports to 10 CFR 50.55(e) items. The review of these documents is being accomplished as a part of the evaluation of programmatic indicators.

ENCLOSURE 1
WELDING PROJECT PROGRAM DESCRIPTION
ATTACHMENT 2
AUDIT WORK PLAN

AUDIT WORK PLAN

WELDING PROJECT - PROGRAM IMPLEMENTATION AUDIT OF WELDING PROGRAMS AT SQN, BFN, AND BLN SITES

GENERAL WORK PLAN

An independent audit will be performed at the direction of and under the general management of the Welding Project Manager.

An audit team comprised of five A/E contract persons, with assistance from TVA as necessary will perform audits of TVA's welding programs as described in the attached Scope of Work Statement to the Audit Team. The A/E contractor will furnish a qualified Audit Team Leader and four qualified auditors.

The audit at each site is expected to take approximately four weeks (6-10 hour days per week), i.e., approximately three weeks for discovery work and one week for entry/orientation and later report writing and exit/status interview with the Welding Project Manager. (See attached audit key date schedule, page 6.) The lead auditor will be responsible for providing a detailed coordinated schedule to the Welding Project Manager. The Welding Project Manager will distribute the detailed schedule to all affected organizations. The Welding Project will provide data on site employee concerns, generic employee concerns, and quality indicators.

The audit team will be under the site administrative controls at each site.

The lead auditor shall be responsible for developing an Audit Plan for each audit. The plan is to be submitted to the Welding Project Manager for approval. The audit team is to review the site relevant and generic employee concerns and the problem areas identified and the results of the quality indicator analysis, in preparing the Audit Plan.

Each TVA group will provide objective evidence, as requested by the auditors, in their area of responsibility.

The Welding Project will review the findings of these audits for specific problems and programmatic implications. The Welding Project Manager will notify the responsible TVA organizations of audit team findings in writing. Each organization will be responsible for implementing corrective action(s) for findings affecting their organization. Each affected organization is to use their respective QA programs to disposition these findings and will respond to the Welding Project on each finding.

The A/E contractor is required by contract to maintain a TVA-approved quality assurance program. The experience/qualifications requirements for the auditors are as noted below.

All auditors shall be technical specialists with special abilities, specialized technical training and prior experience in the welding elements of a quality assurance program.

Technical specialists used in the audit shall have at least three years experience in welding or inspection activities during construction, maintenance, or modification of nuclear power plants and shall have a BS degree in engineering or a related field. Appropriate experience may be substituted for a BS degree at the sole discretion of TVA. The A/E contractor shall submit the required records of personnel qualification for all auditors to be used during the audit to TVA. The audit team may use additional auditors during the audit after TVA approval of their record of qualification.

At least one auditor shall have specialized training or qualifications in the following:

- American Institute of Steel Construction Specification for the Design Fabrication and Erection of Structural Steel for Buildings
- American Welding Society Structural Welding Code-Steel D1.1
- American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section III, "Nuclear Power Plant Components"
- American Society of Mechanical Engineers Code for Pressure Piping B31.1, Power Piping

At least one auditor shall meet the experience requirements of ASNT-TC-1A to be certified as a Level III in two methods of nondestructive examination.

Auditor personnel resumes will be submitted to the Welding Project Manager prior to the audit in which they participate.

The audit team is to review the quality assurance elements of the welding programs of the Office of Construction (OC), which did the original construction of each plant and the Office of Nuclear Operations (NO). NO is currently responsible for modifications and maintenance. Obviously, for plants under construction where Nuclear Operations is not significantly involved, NO will be audited to a lesser degree.

The audit team is to start at the Office of Engineering's (OE) design output documents and go through to the documentation of completion and inspection of the weld. They are to evaluate the adequacy[1] of the various programs noted below, through review of objective evidence. A number of representative work packages will be selected by the auditors in each area of welding, i.e., structural and other supports, piping supports, piping and equipment. The number of work packages selected by the audit team shall be equal to or greater than the number in the contractor's Construction site audit work plan, as applicable. In addition to the packages selected by the audit team, the Welding Project may request the audit team to review additional items.

[1]The technical or engineering adequacy of the design output documents is not to be researched, their adequacy is to be checked in the sense of completeness of information for the organization or individual who must use the document to continue forward with the program.

It is expected that the auditors will review hundreds of documents. It is also expected that the auditors will expand their review when a discrepant item is noted to develop an opinion as to the discrepancy's importance, i.e., it is an isolated instance or a more frequent occurrence.

The approximate number of samples of audit category is noted below.

QC	NO	
12	12	Adequacy of design output documents (see note 1, page 4)
15	15	Initial welder or welding operator qualifications
15	15	Maintenance of welder or welding operator qualifications
8	8	Renewal of welder or welding operator qualifications
8	8	Initial welding inspection personnel qualifications
8	8	Maintenance of welding inspection personnel qualifications
8	8	Renewal of welding inspection personnel qualifications
8	8	Use of appropriate welding procedures
8	8	Use of appropriate inspection procedures
8	8	Use of appropriately trained and qualified personnel
20	20	Use and control of welding filler materials
8	8	Inprocess control of welding
*	*	Documentation of the above activities
18	18	Nonconformances and corrective actions
*	*	Training programs adequacy
*	*	Additional areas of concern as determined by a review of employee concerns

*To be determined by the audit team; these may be supported by other programs.

AUDIT KEYDATE SCHEDULE — SQN, BFN, BLN

Sequoyah Nuclear Plant

Start: January 6, 1986

Finish: February 3, 1986

Exit Interview &

Written Report: February 3, 1986

Browns Ferry Nuclear Plant

Start: February 10, 1986

Finish: March 10, 1986

Exit Interview &

Written Report: March 10, 1986

Bellefonte Nuclear Plant

Start: March 17, 1986

Finish: April 14, 1986

Exit Interview &

Written Report: April 14, 1986

SCOPE OF WORK STATEMENT

Perform an audit of welding elements of the quality assurance programs of the following organizations to implement the welding requirements specified in approved Office of Engineering design output documents to install, maintain, modify, or add to safety-related permanent plant equipment or structures.

Location	Organization	Program
Browns Ferry	Nuclear Operations	Structural steel & all other supports
Browns Ferry	Nuclear Operations	Piping supports
Browns Ferry	Nuclear Operations	Piping and equipment
Browns Ferry	Office of Construction	Structural steel & all other supports
Browns Ferry	Office of Construction	Piping supports
Browns Ferry	Office of Construction	Piping and equipment
Sequoyah	Nuclear Operations	Structural steel & all other supports
Sequoyah	Nuclear Operations	Pipe supports
Sequoyah	Nuclear Operations	Piping and equipment
Sequoyah	Office of Construction	Structural steel & all other supports
Sequoyah	Office of Construction	Pipe supports
Sequoyah	Office of Construction	Piping and equipment
Bellefonte	Nuclear Operations	Structural steel & all other supports
Bellefonte	Nuclear Operations	Piping supports
Bellefonte	Nuclear Operations	Piping and equipment
Bellefonte	Office of Construction	Structural steel & all other supports
Bellefonte	Office of Construction	Piping supports
Bellefonte	Office of Construction	Piping and equipment

The audit shall evaluate the adequacy of the various programs in the following areas.

- o Implementation of technical and welding program requirements
- o Adequacy of design output documents (see note 1, page 4)
- o Initial welder or welding operator qualifications
- o Maintenance of welder or welding operator qualifications
- o Renewal of welder or welding operator qualifications
- o Initial welding inspection personnel qualifications
- o Maintenance of welding inspection personnel qualifications
- o Renewal of welding inspection personnel qualifications
- o Use of appropriate welding procedures
- o Use of appropriate inspection procedures
- o Use of appropriately trained and qualified personnel
- o Use and control of welding filler materials

- o Inprocess control of welding
- o Documentation of the above activities
- o Nonconformances and corrective actions
- o Training programs adequacy
- o Additional areas of concern as determined by a review of employee concerns

1. Before start of the audit, the auditing team shall review all site specific and generic concerns and dispositions related to welding as identified by the TVA employee concern program. The review shall determine which of the concerns it believes to be important to the proper implementation of the welding elements of a quality assurance program. Its audit shall include the adequacy of the quality assurance program in these areas of concern to implement the welding requirements of applied Office of Engineering design output documents.

2. The audit shall be conducted to the above scope to verify, by examination of objective evidence, compliance with the welding aspects of the quality assurance programs and to determine the effectiveness of the welding aspects of the TVA quality assurance programs.

3. The audit shall be performed in accordance with written procedures or checklists by personnel who do not have direct responsibility for performing the activities being audited. Audit results shall be documented in a written report and presented to the TVA Welding Project Manager.

4. The A/E contractor shall have a quality assurance program capable of ensuring that the audit is conducted in accordance with the requirements of this specification and meeting the requirements of ANSI/ASME NQA-1-

1983, Addenda 1A, "Quality Assurance Program Requirements for Nuclear Power Plants" or U.S. NRC Regulatory Guide 1.28 Rev. 2, 1.144 Rev. 1 and 1.146 Rev. 0.

5. TVA will be responsible for all responses and followup actions.

6. The A/E contractor shall maintain records of the qualification and training of all its auditors and lead auditor.

REPORTING

An audit report shall be signed by the audit team leader, issued, and submitted to the TVA Welding Project Manager at the conclusion of each audit.

EXIT INTERVIEW

An exit interview will be conducted with the Welding Project manager by the audit team at the conclusion of each audit.

EXPERIENCE/QUALIFICATIONS

All auditors shall be technical specialists with special abilities, specialized technical training and prior experience in the welding elements of a quality assurance program.

Technical specialists used in the audit shall have at least three years experience in welding or [illegible] welding construction,

maintenance, or modification of nuclear power plants and shall have a BS degree in engineering or a related field. Appropriate, additional experience may be substituted for a BS degree at the sole discretion of TVA. The A/E contractor shall submit the required records of personnel qualification for all auditors to be used during the audit to TVA along with their bid. The audit team may use additional auditors during the audit after TVA approval of their record of qualification.

At least one auditor shall have specialized training or qualifications in the following:

- o American Institute of Steel Construction Specification for the Design Fabrication and Erection of Structural Steel for Buildings
- o American Welding Society Structural Welding Code-Steel D1.1
- o American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section III, "Nuclear Power Plant Components"
- o American Society of Mechanical Engineers Code for Pressure Piping B31.1, Power Piping

At least one auditor shall meet the experience requirements of ASME Section III to be certified as a Level III in two methods of nondestructive examination.

ENCLOSURE 2
TVA ACTION PLAN - WELDING RELATED ACTIVITIES
SQN UNITS 1 & 2

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TVA ACTION PLAN - WELDING RELATED ACTIVITIES

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2

TVA activities being performed to ensure that Sequoyah's welding program and safety-related welds are adequate to support restart of the Sequoyah units are described below. The activities are conducted by both the Welding Project and by Nuclear Operations.

I. WELDING PROJECT ACTIONS

WELDING PROJECT PHASE I ACTIONS

The objectives of this work are to determine (1) that the Sequoyah welding program, during the construction phase and as it exists today, addresses TVA licensing commitments; (2) through a review of welding related Quality Indicators (Corrective Action Reports, audit reports, etc.), and employee concerns that programmatic requirements are being implemented and (3) where deficiencies exist. This work will be accomplished as follows:

Task 1 - Review TVA Commitments to NRC

Task 2 - Verify that Office of Engineering and Nuclear Operations welding programs reflect licensing commitments and that the program in place during the construction phase contained the key elements to control and perform quality welding activities.

Task 3 - Assemble, identify, and categorize welding-related Quality Indicators issued by Nuclear Operations at Sequoyah and Employee Concerns.

Task 4 - Analyze and evaluate effect of quality indicators including Employee Concerns on programs.

Task 5 - Issue Statement regarding the adequacy of the written welding program to implement/control welding. Identify deficiencies and initiate any corrective actions or improvements.

The implementing details for these tasks are described in the Welding Project Program Description.

II. WELDING PROJECT PHASE II ACTIONS

The purposes of Phase II are to: evaluate the implementation of procedures; verify that the installed weldments meet requirements or are adequate for service; correct any problems, implement changes to prevent recurrence. This work will be accomplished by the following actions:

1. Contract with outside consultant (APTECH Engineering) to assess plant fitness for service (see Attachment 1 for description).

2. Perform independent audits of welding program implementation (see Attachment 2 of Enclosure 1 for program description).

   A. For the historic construction program which was used to build Sequoyah

   B. For Nuclear Operations program in place

3. Evaluate the need for reinspections based on TVA quality indicators independent audits and employee concerns.

4. Implement any additional reinspections and deficiency resolutions (both individual and generic cases).

The implementing details for these actions are described in the Welding Project Program Description.

In the case of SQN, a determination has been made to conduct some reinspections. The work plan for these is attached. (Attachment 2) The purpose of these reinspections is to address nonspecific employee concerns. These reinspections are to reestablish confidence in the original welding program. These reinspections may also address some other concerns.

At the conclusion of the above activities, a final report will be issued regarding SQN.

III. Integration of Results to Support Restart

Welding Project will determine the adequacy of the written program and will assess any program enhancements identified as a result of the welding project review as discussed in Section I to determine impact on restart of Sequoyah units. Welding Project and/or SQN Project will evaluate the result from the audit and reinspections.

TVA will also determine if the conclusions of the APTECH independent analysis as described in Section II are commensurate with accepted industry standards, TVA commitments, and support restart of the Sequoyah units.

The evaluations provided by Section I and II will enable TVA to determine if the Sequoyah welding program and the safety-related welds are adequate to support re-start of the units. Once the units are operational, TVA will continue to rely on program monitors and inservice inspections to assure that a high quality welding program is being maintained at Sequoyah.

IV. Schedule

Welding Project Phase I -		1-24-86
Determination of Service Suitability (APTECH) -		1-24-86
Reinspection Plan -)	) Welding Project Phase II	1-24-86
Independent Audit -)		2-3-86
Completion of TVA Evaluation of Results -		2-10-86

ENCLOSURE 2
ATTACHMENT 1
SQN DETERMINATION OF
SERVICE SUITABILITY OF WELDS

SQN DETERMINATION OF SERVICE SUITABILITY OF WELDS

A. PROJECT OBJECTIVES

The objectives of this work are as follows: To validate the quality and determine the service suitability of the welds at Sequoyah Nuclear Plant (Units 1 and 2) SQN. The approach that TVA, through its independent contractor, APTECH Engineering, will pursue is summarized in the following three tasks:

Task 1 - Review of the welding program during construction phase

Task 2 - Evaluation of PSI and ISI data

Task 3 - Evaluation of Operating Experience

B. TASK DETAILS

1. Task 1 - Welding Program Review

In this task, APTECH is evaluating all those elements that contributed to the production of a controlled weld during the construction phase of Sequoyah. This will include preparation of a matrix that defines welding related operations (weld materials control, welder qualification and continuity, etc.) and identifies construction procedures which were in place to implement and control these operations. The matrix will be compared to applicable standards and requirements to verify that TVA's program contained the necessary checks and balances to ensure high quality welds. In addition, APTECH will select two weld data packages to verify that the welding program was properly implemented.

2. Task 2 - Evaluation of PSI and ISI Results

The scope of APTECH's evaluation includes all PSI and ISI inspection records through 3 cycles of operation for unit 1 and 2 cycles of operation for unit 2. This represents approximately three thousand inspections. APTECH will evaluate the Notices of Indications (NOIs) associated with these inspections and use this "indication rate" to measure the quality of the welds. APTECH is to address the significance of this data upon operational safety and derive conclusions regarding construciton practices.

This evaluation is performed because of the following logic (a) Section XI piping and all other safety-related pipe welds were originally welded and inspected to the same program; (b) Section XI structurally significant supports and all other safety-related structural welds were welded to the same program; (c) a large number of pipe welds have been PSI and ISI program inspected. The PSI and ISI results are significant Quality Indicators of Sequoyah welds, and if systemmatic, widespread and/or chronic deficiencies existed in Sequoyah welds/welding, this would produce unfavorable PSI/ISI results.

3. Task 3 - Evaluation of Operating Experience

The APTECH evaluation of operating experience of the Sequoyah units is conducted by scrutinizing LERs and potential reportable occurrences for indications of deficient weld quality as reflected in operation performance. As such, these components of operation also become Quality Indicators and reflect the overall quality of Sequoyah welds/welding. APTECH will submit a final report to TVA summarizing the results of their investigation and their conclusions with regard to the service suitability of the Sequoyah welds.

ENCLOSURE 2
ATTACHMENT 2
REINSPECTION PLAN
WELDING RELATED ACTIVITIES
SQN UNITS 1 & 2

WELDING PROJECT
PHASE 2, PART 2
SEQUOYAH REINSPECTION OF SELECTED WELDS
REINSPECTION PLAN

OBJECTIVE

The objective of the program described in this submittal is to provide additional data addressing the adequacy of the Sequoyah weld program and to provide indicators regarding the suitability of welding in relation to restarting the SQN Units and address nonspecific employee concerns related to welding.

BACKGROUND

Employee concerns from Watts Bar have possible generic implications to the Sequoyah plant. Some of these concerns relate to the adequacy of: quality of weld filler materials, control of weld filler materials, welder qualifications, inadequate training of welders, inspector qualifications, falsification of records, weld adequacy, and record keeping. A reinspection of hardware to design requirements and comparison to the records package cuts across these and other issues to address the concerns, the welding program adequacy, and provides additional data regarding the suitability for restart of SQN Units.

Nonspecific employee concerns are best addressed by reestablishing confidence in the original programs. Inadequacies in the welding program in the areas of these concerns would be reflected in the hardware quality and the relevant records. While the concerns have generic implications, this reinspection will address them by focusing on safety portions of the plant where there have been fewer previous inspections and, therefore, fewer opportunities for weld defects to have been identified. Because Class 1 and 2 piping receive more inspections during construction, Preservice Inspection (PSI) and Inservice Inspection (ISI), these piping systems will be excluded. This is a conservative approach and biases the reinspection toward items which have had only one required inspection, and, therefore, have the most likelihood of having previously unreported defects.

This reinspection cuts across the various construction crafts, acceptance criteria, and timeframes of the construction phase as well as the operational phase of Sequoyah. To address these elements it is necessary to reinspect selected welds on piping and pipe supports, HVAC duct supports, conduit supports, cable tray supports, and miscellaneous structural steel within the safety-related portion of the plant.

Due to an employee concern on the duct work made from spiral welded pipe at Watts Bar Nuclear Plant and its subsequent investigation, TVA will reexamine a portion of a like system at SQN to verify that field welded joints meet the design requirements.

Due to the normal construction sequence at a job site, and because various crafts are involved throughout the construction phase, the selection of different systems and structures at various elevations of the plant will cut across different timeframes of plant construction. Piping and supports, electrical supports, HVAC supports, and structural steel are all installed by different crafts. Although the crafts are different, the welding programs are basically the same except for piping. For conservatism in this Work Plan, the installation crafts are being considered. Pipefitters', ironworkers', electricians', and sheetmetal workers' welds will be included in the reinspection. This increases the number of welds being reinspected. Five groups have been developed based on the welding program and the crafts which implement the program. The reinspection effort also includes some modifications performed by Nuclear Operations.

SCOPE

The reinspection of features described below addresses the concerns described above for various installation crafts and various timeframes.

1. Selected piping and attachment welds in Class 3 and ANSI B31.1 systems (ERCW, CCW, and AFW) at various elevations in the auxiliary building. The sample will include carbon and stainless steel lines.
2. Welds of supports for piping (related to above lines).
3. Welds of cable tray supports and conduit supports in the Auxiliary Building.
4. Structurally significant welds on miscellaneous structural steel in the Auxiliary Building.
5. HVAC support welds in the Auxiliary Building.

Approximately 100 welds will be reinspected in each of the above groups. The items to be reinspected were selected to provide a representative look at each of the above classes and to cover work that was performed during the construction phase and during the operating phase. The reinspection is to be in areas which will minimize inspector exposure to radiation. Welds which are inaccessible due to wall or floor penetrations, or fireproofing will be excluded. RI

6. In addition to the above groups, butt-welds will be visually examined for a portion of spiral welded pipe used as ductwork. RI

For the structural steel and support welds, the principle weld attributes to be addressed are presence, size, length, and location. Existing coatings will not affect this inspection. However, thickness as measured by a dry film thickness indicator will be reported for information. Structurally significant weld discontinuities detected through coatings will also be reported. Weld discontinuities, such as porosity, which indicate inadequate filler metal are to be reported. The generic type of filler metal is also to be reported, carbon steel as opposed to stainless steel. RI RI

For piping welds, the inspection will be that which was required by the Construction Code of record (B31.7 1969 Edition with 1970 Addenda and B31.1 1967 Edition). Visual inspection will also be applied to all welds to assess indicators of weld filler metal adequacy such as porosity, and indicators of welder qualification. Weld metal generic type will also be checked by magnetic means. RI

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CRITERIA

All inspections will be conducted in accordance with established visual inspection procedures and this work plan. In case of conflicts, this work plan shall govern. Structural steel and support welds which were designed based upon the AISC specification will be reinspected to drawing requirements in accordance with NCIG-01. Coatings need not be removed. Pipe welds will be reinspected to the B31.1 (1967 Edition) or B31.7 (1969 Edition with 1970 Addenda) code of record using the visual and nondestructive examination methods (other than volumetric) and acceptance criteria. The generic filler metal type for all welds will be checked by the use of magnets. The acceptability will be based upon the weld metal being of the correct type; carbon steel or stainless steel as appropriate for the materials being joined. The confirmation of generic filler material type does not require a special procedure, as it is an accept/reject test. The results of filler metal type shall be recorded on the respective visual examination records. The acceptance criteria for spiral duct butt-welds will be the design requirements supplemented by the special data section. R1

REINSPECTION PERSONNEL

All structural and support inspection personnel shall be qualified as AWS-Certified Welding Inspectors (CWIs). The CWIs will be from TVA's Quality Engineering Branch (Vendor Surveillance). For piping, inspection personnel shall be qualified in accordance with SNT-TC-1A or equivalent (certification program for visual patterned after the format for NDE established in SNT-TC-1A) Level II or III. R1

QUALITY ASSURANCE

Overview of this reinspection effort will be provided by a person or persons independent of TVA who have current certification as AWS Certified Welding Inspector (CWI) for structural steel, supports, and duct and SNT-TC-1A Level III for piping. The independent inspector(s) will provide a written report to the Welding Project Manager summarizing the overview activity and his concurrence or reason for disagreement with the results. R1

SPECIAL DATA

The inspectors will make a notation for each weld, their own opinion regarding the quality of the welders work: better than average, average, or does not meet requirements. The inspectors will note if the weld has been coated. In making the evaluation, the inspectors will consider undercut, porosity, convexity, spatter, overlap, or rollover and/or other specific indicators which he observes. This opinion is to be recorded on the inspection record. R1

RECORDS

For each weld there will be a record of acceptability as to presence, size, length, location, and structurally significant defects, the generic type of filler metal, indicators of filler metal quality and the inspectors opinion of the welder workmanship. R1

PLANT SAFETY & SECURITY

The plant safety and security procedures will apply.

RECORDS COMPARISON

Part of the independent verification audit will be to address at least one document package which the auditors select from each of the above five reinspection groups to confirm the records adequacy, and thereby close the loop regarding records and program adequacy. The independent audit is being performed by Bechtel and is described in the Welding Project Program Description as part of Phase 2, Part 1.

DISPOSITION OF DISCREPANT CONDITION

Discrepancies will be documented in accordance with TVA quality assurance program and dispositioned by the engineering organization using engineering justification to use as-is or to provide corrective action. Determination of generic importance of descrepancies to the welding program will be performed by the Welding Project. All defects which require engineering disposition will be reported along with the ultimate dispositon. The NRC will be notified immediately if significant discrepancies are identified during the reinspection. Root causes will be investigated. All this will be included in the Phase 2 Final Report. R1 R1

INSPECTION REPORT

The Inspection Report on this reinspection will immediately be forwarded to TVA Management and NRC and will subsequently be included in the overall report on the Welding Project activities on SQN.

SCHEDULE

This reinspection is scheduled to start on January 14, 1986, and is anticipated to be completed within two weeks.

ENCLOSURE 3

TVA ACTION PLAN-WELDING RELATED ACTIVITIES

WBN UNITS 1 AND 2

TVA ACTION PLAN - WELDING RELATED ACTIVITIES

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2

TVA activities being performed to ensure that Watts Bar's welding program and safety-related welds are adequate to support fuel loading of the Watts Bar units are described below. The activities are conducted by both the Welding Project and by Nuclear Safety Review Staff. The NSRS technical activities are conducted principally by a Department of Energy contractor, EG&G Idaho.

I. WELDING PROJECT ACTIONS

WELDING PROJECT PHASE I ACTIONS

The objectives of this work are to determine (1) that the Watts Bar welding program, as it exists today, addresses TVA licensing commitments; (2) through a review of welding related Quality Indicators (Corrective Action Reports, audit reports, etc.), and employee concerns that programmatic requirements are being implemented and (3) where deficiencies exist. This work will be accomplished as follows:

Task 1 - Review TVA Commitments to NRC

Task 2 - Verify that Office of Engineering and Nuclear Operations welding programs reflect licensing commitments.

Task 3 - Assemble, identify, and categorize welding related Quality Indicators issued by TVA at Watts Bar and Employee Concerns.

Task 4 - Analyze and evaluate effect of quality indicators including Employee Concerns on programs.

Task 5 - Issue Statement regarding the adequacy of the written welding program to implement/control welding. Identify deficiencies and initiate any corrective actions or improvements.

The implementing details for these tasks are described in the Welding Project Program Description.

WELDING PROJECT PHASE II ACTIONS

The purposes of Phase II are to: evaluate the implementation of procedures; verify that the installed weldments meet requirements or are adequate for service; correct any problems, implement changes to prevent recurrence. This work will be accomplished by the following actions:

1. Perform independent audits of welding program implementation.

   A. For the historic construction program which was used to build Watts Bar
   B. For construction program in place

2. Evaluate the need for reinspections based on quality TVA indicators audits and employee concerns.

3. Implement any additional reinspections and deficiency resolutions (both individual and generic cases).

4. Issue a final report regarding WBN.

The implementing details for these actions are described in the Welding Project Program Description. The Welding Project activities related to WBN are supplemented by NSRS and contractors activities which also address the adequacy of program records, installed hardware and suitability for service. There is significant interaction which is shown in the attached figure 1. The actions of NSRS/DOE-WEP are described below.

II. NSRS DOE-WEP Evaluation of Welds at WBN Unit 1

A. PROJECT OBJECTIVE

The Primary objective of this work is as follows: To validate the quality and determine the service suitability of the welds of Watts Bar Nuclear Plant (Unit 1). The approach that TVA, through its DOE-WEP contractor, EG&G, will pursue is summarized in the following two tasks:

Task 1 - Perform a comprehensive evaluation of the results of the TVA welding program used during plant construction and after transfer of Watts Bar Unit 1 activities to Nuclear Operations to determine compliance to the FSAR requirements as well as address TVA employee concerns related to the welding program.

Task 2 - Perform a compliance evaluation of the weld program as it exists today to determine compliance to the FSAR requirements and to identify additional features which should be considered to enhance its performance.

B. TASKS

1. Task 1 - Welding Program Review

The "results of the TVA welding program" means (1) compliance of welds to inspection requirements of the applicable code or standard and (2) compliance of work authorization and quality records to the documentation requirements of the applicable code or standard.

"Comprehensive," with respect to evaluation of the results of the TVA welding program, means assessing the results of the weld program used during the entire construction process (approximately 1972 to present) to determine if the number of compliant welds in the population meets TVA standards and to address employee concerns regarding the results of the TVA welding program. The DOE-WEP will review the employee concerns

list to identify the concerns related to welding program performance. The identified concerns will then be evaluated to ensure that the DOE-WEP activities will adequately respond to those concerns. DOE-WEP will determine the need for any reinspections to address specific or nonspecific, possibly generic concerns. DOE-WEP will determine whether 100% or sampling reinspection shall be applied. When sampling is done, the acceptance criteria and methodology to be used are shown in Appendix 1.

2. Task 2

"Comprehensive," with respect to evaluation of the TVA welding program as it exists today, means assessing the existing TVA welding program to determine that it incorporates the requirements of the FSAR and assessing the associated record-keeping system to determine its ability to verify compliance with the requirements of the FSAR. The details of these tasks are presented in Appendix 1.

The NSRS program and the DOE-WEP description of activities is appended to this Action Plan (see Attchment 1).

III. SUMMARY

TVA will also determine if the conclusions of the DOE-WEP evaluation as described in Section II are commensurate with accepted industry standards and support startup of the Watts Bar Unit 1.

The evaluations provided by Section I and II will enable TVA to determine if the Watts Bar welding program and the safety-related welds are adequate to support startup of the unit 1 and also on Unit 2. Once the unit is operational, TVA will continue to rely on program monitors and inservice inspections to assure that a high quality welding program is being maintained at Watts Bar.

IV. Schedule

DOE/WEP Identification of Homogeneous Populations	- 1/23/86
DOE/WEP Selection of 30% of Sample Population	- 2/15/86
Welding Project Phase I Review	- 2/15/86
DOE/WEP Reinspection Start	- 3/1/86
Completion of DOE/WEP Evaluation	- 5/23/86
Welding Project Phase II Review	- 6/6/86
Completion of TVA Evaluation of Results to Support Unit 1 Licensing	- 6/15/86

These are project milestones at this time. Report dates maybe the same.

ORGANIZATIONAL INTERFACES & FLOWCHART WELDING PROJECT & E.G.&G.-IDAHO AT WBN

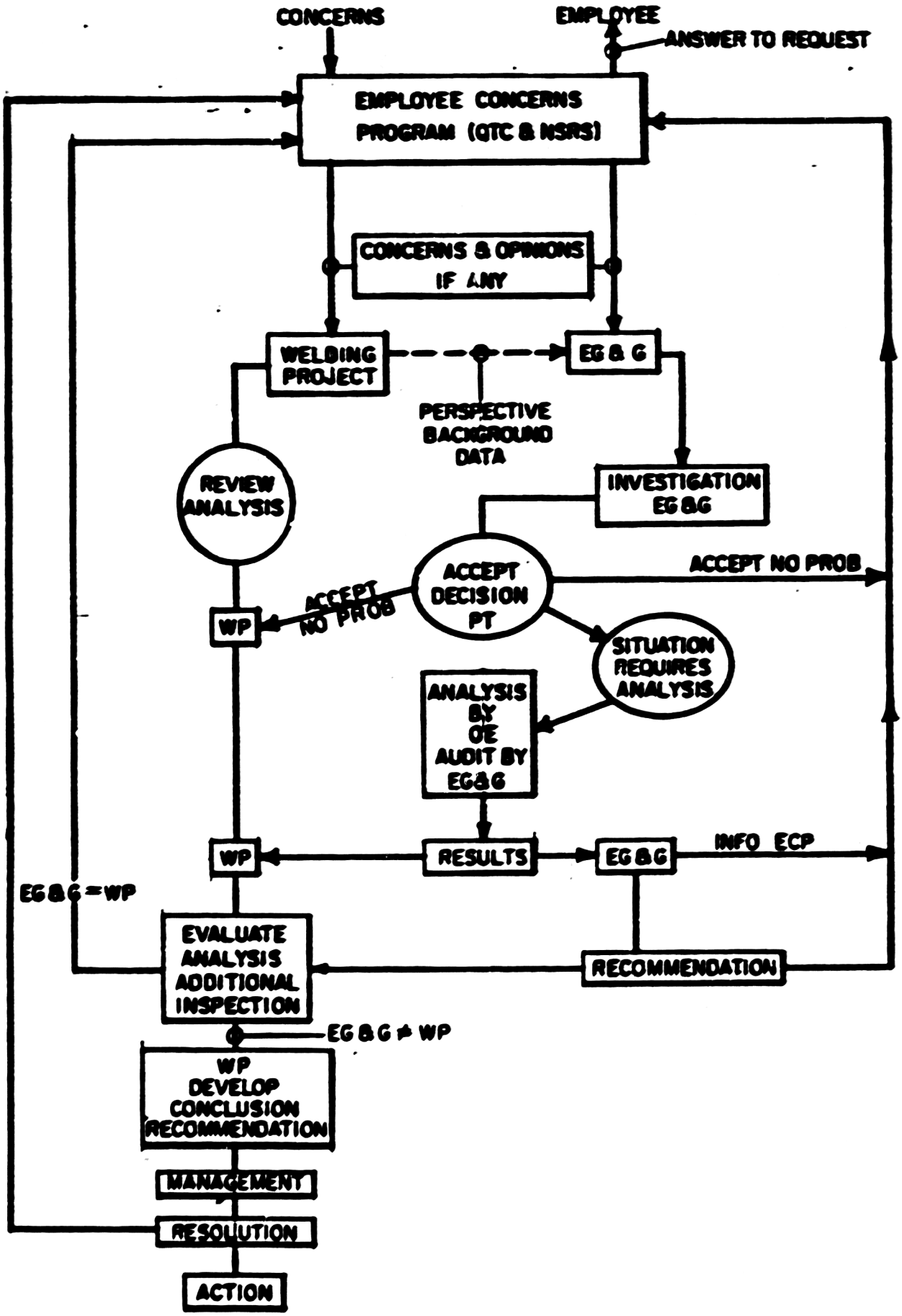

Figure 1

ENCLOSURE 3
WATTS BAR ACTION PLAN
APPENDIX 1
NUCLEAR SAFETY REVIEW STAFF (NSRS)
EVALUATION OF WELDS AT WBN UNIT 1

NUCLEAR SAFETY REVIEW STAFF (NSRS) EVALUATION
OF WELDS AT WBN UNIT 1

Background

As a result of interviewing WBN employees through the employee concern program, approximately 400 concerns were expressed in the area of welding. Concerns varied in nature and scope and, if substantiated, would identify problems from unimportant to serious program deficiencies.

It was decided by NSRS to consolidate investigation efforts on all of the TVA WBN unit 1 welding concerns in order to better assess the impact of the concerns upon plant safety. Unit 1 was chosen because most of the concerns were either generic to both units or specific to unit 1. It was further decided that a considerable amount of reinspection of welds would be required. Considering the above, it was decided the effort could best be accomplished by an outside contractor.

In looking for a contractor, NSRS wanted someone capable of performing the task, with credibility in the nuclear industry and independent. That contractor was chosen to be the Department of Energy (DOE).

Program

The name given to the project is Department of Energy Weld Evaluation Project (DOE-WEP). Through an Interagency Agreement between TVA and DOE (Attachment 1), EG&G Idaho, a DOE prime contractor, was to manage the scope of work identified.

Specifically the DOE-WEP is to.

1. Assess compliance of the TVA weld program and welding results to the TVA commitments, and to communicate to TVA all unresolved weld program deficiencies and nonconforming welds for dispositioning by TVA.

2. Provide a basis for dispositioning those employee concerns for which no impact on weld quality was detected during the assessment.

3. Identify the nonconforming welds associated with each employee concern they investigated for which an impact on weld quality was detected during the assessment, and to communicate those nonconforming welds to TVA for correction and resolution of the concerns.

Specific details on the DOE-WEP project are contained in Attachment 2, "Summary of the Department of Energy Weld Evaluation Project at Watts Bar Nuclear Plant Unit 1."

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To perform the required scope of work the DOE-WEP required specific assurances and information from TVA.

1. Independence to arrive at their own conclusion. That assurance has been given.

2. Access to all relevant technical information, personnel, and facilities. That access has been given.

3. Definition by TVA of the reinspection methodology and acceptance criteria. TVA has provided the following:

   a. Commitment - ASME Section III
      Acceptance Criteria - ASME Section III
      Methodology - NCIG-02

   b. Commitment - ANSI B31.1
      Acceptance Criteria - ANSI B31.1
      Methodology - NCIG-02

   c. Commitment - AWS D1.1
      Acceptance Criteria - NCIG-01
      Methodology - NCIG-02

The DOE-WEP will develop a quality assurance program for these activities and that program will be evaluated by TVA to assure it complies with 10CFR50 Appendix B criteria.

All data developed by DOE-WEP will be provided to NSRS in the form of a final report. Adverse findings identified will be transmitted to NSRS and the TVA line organization, upon detection, for TVA disposition. As the output of this project is a fundamental element of the welding project phase II work for WBN unit 1, close communications have been established between NSRS and the TVA welding project to share information and results of mutual interest. The findings and/or conclusions of this project will be evaluated for applicability to unit 2.

Schedule

The DOE-WEP is scheduled to complete their work by June 6, 1986. That schedule, identified in the interagency agreement, was based upon having approximately 20 sample populations. Should unforeseen problems arise, of course, the schedule will be modified.

Similarly, the agreement allows expansion of the scope through amendments should problems, unforeseen at this time, warrant additional work by the DOE-WEP.

Agreement No. IV-68345A

TECHNICAL ASSISTANCE PLAN

AND INTERAGENCY AGREEMENT BETWEEN

TENNESSEE VALLEY AUTHORITY

AND

U.S. DEPARTMENT OF ENERGY

1. This Technical Assistance Plan and Interagency Agreement (agreement) records the understanding between the Tennessee Valley Authority (TVA) and the U.S. Department of Energy (DOE) whereby DOE will assist TVA in addressing issues important to the startup and continued safe operation of TVA's nuclear power plants by providing specialized technical assistance on a timely, as needed basis. DOE will arrange for the performance of services through its system of national laboratories subject to the terms of its operating contracts with laboratory contractors.

2. This agreement is entered into pursuant to the Tennessee Valley Authority Act of 1933, 16 U.S.C. §§ 831-831dd (1982 & Supp. II 1984), the Department of Energy Organization Act, 42 U.S.C. §§ 7101-7351 (1982 & Supp. II 1984), and the Economy Act of 1932, 31 U.S.C. § 1535 (1982 & Supp. II 1984).

3. The services to be performed by DOE for TVA will be implemented as described below and will, as agreed between DOE and TVA, consist of the following:

   TECHNICAL ASSISTANCE

   DOE will assist TVA in comprehensively evaluating the quality of welds achieved during construction of Watts Bar Nuclear Plant Unit 1 in accordance with Subagreement No. 1, Statement of Work, "TVA Weld Quality Evaluation, Watts Bar Unit 1," attached hereto and made a part hereof.

   Additional areas of technical assistance will be described in separate subagreements to this agreement containing individual Statements of Work, as mutually agreed to between TVA and DOE, which will reference and be performed in accordance with the terms and conditions of this agreement.

4. In consideration of DOE's providing technical assistance under this interagency agreement, TVA will compensate DOE for all services performed pursuant to this agreement in accordance with the full cost recovery policy of DOE (DOE Order 2[illegible]). TVA agrees to make payment for actual costs incurred (direct and indirect) within 30 days after the receipt of monthly Standard Form 1080 invoice. DOE agrees to identify the cost on each invoice according to categories

provided in the cost estimate contained in each subagreement. Invoices shall be forwarded to the TVA contracting officer as specified in each individual subagreement, unless otherwise stated, and shall reference the agreement and subagreement numbers.

5. DOE agrees that all data and information obtained or generated by DOE or its contractors related to or arising from the services provided for TVA under this agreement shall be made available to TVA at reasonable times during DOE working hours, subject to the terms and conditions of this agreement.

6. At the request of TVA, DOE agrees to assist TVA in making any presentations or submissions to the U.S. Nuclear Regulatory Commission (NRC) regarding DOE's performance of services under this agreement.

7. Neither DOE, its contractors, nor persons acting on their behalf make any warranty or other representation, express or implied, with respect to the accuracy, completeness, or usefulness of any information furnished hereunder; that the use of any such information will not infringe privately owned rights; that the services, materials, or information furnished hereunder will not result in injury or damage when used for any purpose; nor that the services, materials or information furnished hereunder will accomplish the intended results or are safe for any purpose including the intended purpose.

8. TVA shall indemnify DOE, its contractors and their officers, agents, and employees against liability, including costs, for infringement of any United States patent arising out of any services required or directed by TVA to be performed under this agreement to the extent such services are not normally performed by DOE or its contractors. Further, the foregoing indemnity shall not apply unless TVA shall have been informed in a reasonable time by DOE or its contractor of any suit or action alleging such infringement, and such indemnity shall not apply to a claimed infringement which is settled without the consent of TVA unless required by a court of competent jurisdiction.

9. TVA agrees to furnish DOE or its contractors all technical data (1) necessary to perform services under this agreement or (2) necessary for the health and safety of such personnel performing services under this agreement. It is recognized that TVA possesses certain technical data which is proprietary in nature and thus exempt from disclosure under the Freedom of Information Act (5 U.S.C. § 522) or disclosable only to NRC in certain instances. DOE and its contractors will preserve and safeguard the confidentiality of TVA's proprietary information to the same extent DOE and its contractors preserve and safeguard the confidentiality of their own proprietary information.

For the purposes of this section 9, the following terms shall have the following meanings:

"Technical data" means recorded information, regardless of form or characteristic, of a scientific or technical nature. It may, for example, document research, experimental, developmental, demonstration or engineering work to be usable or used to define a design or process, or to procure, produce, support, maintain, or operate material. The data may be graphic or pictorial delineations in media such as drawings or photographs, text in specifications or related performance or design type documents, or computer software (including computer programs, computer software data bases, and computer software documentation). Examples of technical data include research and engineering data, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identification, and related information. Technical data as used herein does not include financial reports, cost analyses, and other information incidental to administration of this agreement but may include data produced in the performance of services under this agreement.

"Proprietary data" means technical data which embody trade secrets developed at private expense, such as design procedures or techniques, chemical composition of materials, or manufacturing methods, processes, or treatments, including minor modifications thereof, provided that such data:

(i) Are not generally known or available from other sources without obligation regarding their confidentiality,

(ii) Have not been made available by the owner to others without obligation regarding their confidentiality, and

(iii) Are not already available to DOE without obligation regarding their confidentiality.

"Unlimited rights" means rights to use, duplicate, or disclose technical data, in whole or part, in any manner and for any purpose whatsoever, and to permit others to do so.

Any technical data furnished to DOE or its contractors shall be deemed to have been delivered with unlimited rights unless marked as "Proprietary Data" of TVA or otherwise restricted under the terms of this agreement.

All technical data produced in the performance of services under this agreement by DOE or its contractors shall, prior to any dissemination, publication, or further disclosure of the data by or on behalf of DOE, be made available to TVA for review and appropriate marking where such data discloses proprietary data.

DOE shall have unlimited rights in technical data first produced in the performance of services under this agreement, except as otherwise provided with respect to proprietary data.

TVA will have the sole responsibility for identifying and marking all documents containing proprietary data which are furnished by TVA or produced under this agreement. TVA will mark each such document by or before termination of this agreement or individual subagreements by placing on the cover page thereof a legend identifying the document as proprietary data of TVA and identifying each page and portion thereof to which the marking applies. DOE shall not disclose properly marked proprietary data of TVA outside DOE and its contractors. DOE reserves the right to challenge the proprietary nature of any markings on data.

TVA shall have the unlimited right to use for its own purposes, subject to any restrictions contained in this agreement, technical data first produced in the performance of this agreement.

In the event any TVA proprietary data or any reports, documents, correspondence, or work products related to the services provided by DOE under this agreement containing TVA proprietary data are subpoenaed or otherwise required to be produced or made available to a third party by order of a court, Governmental agency, or otherwise, DOE shall promptly notify TVA in writing and allow ten (10) days from the date of TVA's receiving the notification for response by TVA before producing such data. TVA and DOE will cooperate in obtaining a protective court order, if appropriate, or take such other action as may be appropriate under the circumstances.

Nothing contained in this section 9 shall imply a license to DOE or its contractors under any patent or be construed as affecting the scope of any licenses of other rights otherwise granted to DOE or its contractors under any patent.

TVA agrees to deliver to DOE a nonproprietary description of the services performed under this agreement.

10. All notices under this agreement shall be in writing and forwarded to the individuals specified in individual subagreements.

11. See the Appendix which is attached hereto and made a part hereof for the standard general provisions.

12. The term of this agreement is from the last date of execution and shall terminate one (1) year thereafter, unless otherwise modified or extended by the parties in writing.

13. Costs to be reimbursed by TVA for services performed by DOE under this agreement will be set forth in individual subagreements.

14. Officials Not to Benefit

No member of or delegate to Congress or Resident Commissioner, or any officer, employee, special Government employee, or agent of TVA or DOE shall be admitted to any share or part of this agreement or to any benefit that may arise therefrom, but this provision shall not be construed to extend to a corporation or unit of Government contracting for its or for the public's general benefit.

15. Audit Rights

TVA, working through the Office of the Inspector General, DOE, or the U.S. General Accounting Office, has the right to examine related financial records to verify the accuracy of the amounts reimbursed or to be reimbursed by TVA under this agreement. Nothing in this agreement or in DOE's operating contracts shall be deemed to preclude an audit as provided for in this section 15 of any transaction under this agreement.

16. Third Parties

TVA and DOE expressly assent that by this agreement they make no promises to any third person; and nothing in this agreement shall be construed to give rise to any third-person claim in contract, tort, or otherwise. The parties expressly assent that no third person is an intended beneficiary of this agreement, and the benefits, if any, of this agreement are merely incidental with respect to third persons.

17. Agency Responsibility

Neither TVA nor DOE will be deemed the agent or employee for the other for any purpose unless otherwise expressly agreed to in writing. By this agreement, TVA undertakes no responsibility and assumes no liability in contract, tort, or otherwise for the acts or omissions of DOE, its agents, contractors, or employees that are in any way connected to or arise out of DOE's activities associated with this agreement.

18. Entire Agreement

This agreement constitutes the entire agreement between the parties and supersedes any and all previous agreements and understandings relating to this matter. This agreement may not be altered, amended, or modified, except by written mutual agreement of the parties.

J.F. MARMO

U.S. DEPARTMENT OF ENERGY

By J.F. Marmo

Title DIRECTOR-CMD

Date 1/2/86

TENNESSEE VALLEY AUTHORITY

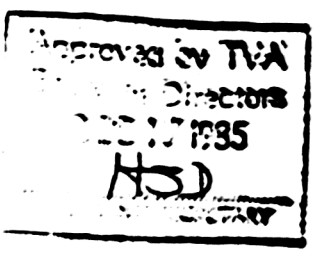
By

Title

Date

OGC E/V

Attachments



APPENDIX

STANDARD GENERAL PROVISIONS

TVA-DOE INTERAGENCY AGREEMENTS

I. Definitions. The term "Secretary" means the Secretary of Energy, the statutory head of the Department of Energy (hereinafter referred to as "DOE"), or any duly authorized representative thereof. The term "TVA" means the Tennessee Valley Authority or any duly authorized representative of TVA. The term "IA" means interagency agreement. "TVA contracting officer" means the individual so designated in each individual subagreement.

II. Direct Costs Chargeable to TVA Funds. Direct costs are the costs that can be directly identified with and charged to the work under the IA and within the limitations set forth below. Examples of such costs are salaries/wages, technical services, materials, travel and transportation, communications, and any facilities and equipment expressly approved for purchase under the IA.

a. Expenditures for domestic travel expected to exceed $1,000 per individual trip shall not be allowable hereunder without prior approval of the TVA contracting officer. All travel and computations for reimbursements for travel shall be in accordance with Section 31.205-46 of the Federal Acquisition Regulations and DOE-approved prime contractor travel procedures.

b. Foreign travel costs are not allowable.

c. Reimbursement for expenditures at technical meetings and seminars at which attendance is not required by TVA is not allowable.

III. Financing: Reimbursement Agreement. Upon presentation by DOE of Standard Form 1080, TVA shall reimburse DOE for costs actually incurred on TVA work, subject to any limitations on costs otherwise provided in this IA.

IV. Notice of Costs Approaching Total Estimated Costs. Whenever DOE has reason to believe that the total cost of the work under this IA will be substantially greater or less than the presently estimated cost of the work, DOE shall promptly notify TVA in writing. DOE shall also notify TVA, in writing, when the aggregate of costs incurred and outstanding commitments allowable under the IA is equal to 90 percent (or such other percentage as TVA may from time to time establish by notice to DOE) of the presently estimated total costs under this IA. When

the costs incurred and commitments outstanding equal 100 percent of such estimated total costs, DOE shall make no further commitments or expenditures (except to meet existing commitments) and shall be excused from performance of the work unless and until TVA shall increase the total estimated costs to be incurred with respect to this IA.

V. Accounting Records. DOE shall accumulate and account for obligations and costs incurred in connection with the work being performed under this IA.

VI. Termination. TVA may terminate this IA upon 30 days' written notice of such termination addressed to DOE. In the event of termination, DOE shall be reimbursed for obligations actually incurred prior to TVA's notice of termination and for commitments extending beyond the effective date of termination to a date not later than the date upon which the IA would have expired if not terminated under this paragraph, which DOE, in the exercise of due diligence, is unable to cancel. Payments under this IA, including payments under this article, shall not exceed the ceiling amount elsewhere specified in this IA.

VII. Capital Equipment

a. "Capital equipment" means each item of equipment which is expected to have an extended period of service, generally a year or more, and has sufficient monetary value, generally of $1000 or more, to justify continuing accounting records for the item.

b. DOE shall not be reimbursed or use funds made available under this IA for the procurement or fabrication of capital equipment.

VIII. Environmental Safety and Health Requirements. TVA will not assume responsibility for prescribing and/or enforcing environmental safety and health requirements for DOE personnel engaged in the performance of TVA work. DOE and its contractors will comply with applicable TVA health, safety, and security requirements.

IX. Real Property and Facilities. DOE shall not be reimbursed or use funds made available under this IA for the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion.

X. Patents. It is understood and agreed by DOE and TVA that the rights to any invention or discovery made or conceived in the course of or under this IA shall be determined as set forth below:

(a) Where the work performed results in an invention made or conceived by an employee, consultant, or contractor of DOE, the patent provisions of the applicable DOE operating contract shall be applicable to any such invention or discovery. After filing for or issuance of a patent on any such invention or discovery, DOE agrees to grant to TVA an irrevocable, nonexclusive, paid-up license for the manufacture and use of such invention or discovery. TVA shall have the right to grant sublicenses for the use or manufacture of such invention or discovery.

(b) Where the work performed results in an invention made or conceived by an employee, consultant, or contractor of TVA, any such invention or discovery shall be reported and handled in accordance with the TVA Act and TVA patent procedures. The rights to any such invention or discovery shall be determined by TVA. TVA agrees to grant to DOE an irrevocable, nonexclusive, paid-up license for the manufacture and use of such invention or discovery. DOE shall have the right to grant sublicenses for the use or manufacture of such invention or discovery.

(c) No claim for pecuniary award or compensation of any kind shall be asserted by TVA, DOE, or their respective employees, consultants, or contractors against the other with reference to any such invention or discovery.

(d) It is recognized that, during the course of the work under this IA, either party or their employees, consultants, or contractors may, from time to time, desire to publish, within the limits of security requirements, information regarding scientific or technical developments made or conceived in the course of or under this IA. In order that public disclosure of such information will not adversely affect the patent interests of DOE or TVA, patent approval for release and publication shall be secured from the other party prior to any such release or publication.

Agreement No. TV-68345A
Subagreement No. 1

Statement of Work

TVA WELD QUALITY EVALUATION
WATTS BAR UNIT 1

In accordance with the terms and conditions of the Technical Assistance Plan and Interagency Agreement between the Tennessee Valley Authority (TVA) and the U.S. Department of Energy (DOE) (Agreement No. TV-68345A), DOE will perform a comprehensive evaluation of TVA's Watts Bar Unit 1 welding program. Specifically, DOE will assemble a task force (Task Force) as described in Attachment A to this subagreement, which will perform a comprehensive evaluation of (1) the results of the TVA welding program used during construction of the Watts Bar Plant 1 to determine compliance to the FSAR requirements as well as address TVA employee concerns related to the welding program and, (2) if deemed necessary by TVA, the weld program as it exists today to determine compliance to the FSAR requirements and to identify additional features which should be considered to enhance its performance. The results of this evaluation will be presented to TVA's Nuclear Safety Review Staff (NSRS).

For the purposes of this subagreement, the "TVA welding program" means the welding requirements documents such as the ASME, ANSI B31 series, and AWS codes as specified by the FSAR; the weld manual or similar document that defines how the welding requirements will be

implemented and the associated implementing practices or procedures; the work authorization documents that caused the welding to be performed; the quality records; and the management documents that measured the program effectiveness.

The "results of the TVA welding program" means (1) compliance of welds to inspection requirements of the applicable code or standard and (2) compliance of work authorization and quality records to the documentation requirements of the applicable code or standard.

"Comprehensive," with respect to evaluation of the results of the TVA welding program, means assessing the results of the weld program used during the entire construction process (approximately 1972 to present) to determine if the number of compliant welds in the population meets TVA standards and to address employee concerns regarding the results of the TVA welding program. The Task Force will review the employee concerns list to identify the concerns related to welding program performance. The identified concerns will then be evaluated to ensure that the Task Force activities will adequately respond to those concerns. It is not anticipated that those concerns will require examination of the structural welds of the base foundation or of the welds on purchased components or assemblies. Further, it is assumed that the weld requirements are correctly transcribed into the design drawing and specification documents.

"Comprehensive," with respect to evaluation of the TVA welding program as it exists today, means assessing the existing TVA welding program to determine that it incorporates the requirements of the FSAR and assessing the associated record-keeping system to determine its ability to verify compliance with the requirements of the FSAR.

2.0 TECHNICAL APPROACH

2.1 Evaluation of Welding Program Utilized During Construction of Watts Bar Plant 1 (1972 to Present)

DOE will evaluate the performance of the TVA weld program utilized during the construction of Watts Bar Unit 1 through a weld reexamination and weld record documentation review program. The number of noncompliant components will be compared to established standards. This reexamination and record review program will utilize statistical sampling techniques. The reexamination and record review program will be accomplished in two phases: Phase I will entail identification of homogeneous populations, development and qualification of procedures, assembly and qualification of personnel for Phase II work, development of scope, cost estimate, and schedule for Phase II work; and Phase II will entail performance of reexamination, engineering evaluation, data analysis, and data reporting.

2.1.1 Phase I Scope of Work

A. Task Force will prepare and issue a project management plan. This plan will define the Task Force organizational structure, define the objectives of the Task Force activities, define the responsibilities of the Task Force suborganizations, and define the control and reporting requirements for the Task Force activities. TVA will be afforded the opportunity to review the project management plan prior to its finalization.

B. Task Force will issue a quality assurance program plan. This plan will define the requirements, responsibilities, and procedures for overviewing the various activities of the Task Force to ensure high quality of task performance. The quality assurance program plan will be in accordance with ASME NQA1, Quality Assurance Program Requirements for Nuclear Facilities. TVA will be afforded the opportunity to approve the quality assurance program plan prior to its finalization.

C. Task Force will prepare and issue detailed procedures for the accomplishment of the welding program performance evaluation and welding program evaluation tasks. It is anticipated that this subtask will require the preparation of approximately 20 individual procedures. TVA will be afforded the opportunity to review these procedures throughout the period of their development.

B. Task Force will prepare inspection plans for documentation review, reexamination of piping welds, and reexamination of structural welds.

E. Task Force will perform the initial task activities required to support the weld reexaminations and document review. These activities will include, but not be limited to,

- Review the TVA employee concerns list.
- Review the TVA welding documentation from approximately 1972 to present.
- Establish uniform work processes.
- Identify the safety systems for the Watts Bar Unit 1.
- Define the homogeneous groups to be reexamined.
- Select the samples for approximately one-third of the homogeneous groups.
- Qualify the reexamination procedures.
- Certify Task Force personnel and TVA nondestructive examination personnel used.

- Prepare cost estimates and schedules for performing the weld reexaminations, document reviews, and engineering evaluations based on identified homogeneous groups for Phase II work.

- Perform readiness review to demonstrate Task Force is prepared to perform actual Phase II reexamination and documentation reviews. This review will be performed by an organization which is independent of the Task Force in accordance with EG&G Idaho, Inc., practices.

F. Task Force will establish an office at the Watts Bar Unit 1, including, but not limited to, obtaining from TVA the required office equipment, data processing equipment and software, and record storage facilities.

G. Task Force will be staffed to the level required to perform Phase II work.

It is understood between the parties that in accomplishing the above Phase I work, members of the Task Force may informally discuss the nature of their work with NRC personnel. Task Force personnel will inform TVA of any such discussions. Any formal discussions with NRC will be coordinated through TVA and conducted in accordance with the terms of the Technical Assistance Plan and Interagency Agreement (TV-68345A).

2.1.2 Phase II Scope of Work

Phase II work is directly dependent upon a determination of the number of welds identified under Phase I which requires reexamination. Upon completion of Phase I activities, the parties will enter into a written amendment to this Subagreement No. 1, describing the work to be accomplished in Phase II.

2.2 Evaluation of Current Welding Program for Enhancement of Performance

Upon completion of the work described in Section 2.1 above, TVA, at its sole discretion, will make a decision whether to fund the Task Force's evaluation of the current Watts Bar Unit 1 welding program. Such decision will be made in sufficient time to allow the Task Force to make a smooth transition from the work accomplished under Section 2.1. All work to be accomplished under this Section 2.2 will be set forth and agreed to under a separate written amendment to this Subagreement No. 1.

3.0 SCHEDULE OF DELIVERABLES

Final versions of all deliverables identified in Section 2.1.1, (A), (B), (C), and (D) above will be provided to TVA on or before March 19, 1986.

4.0 PERIOD OF PERFORMANCE

This Subagreement No. 1 will commence on October 1, 1985, and will terminate on June 6, 1986, unless otherwise modified or extended by the parties in writing.

5.0 COST OF PERFORMANCE

TVA will reimburse DOE a maximum amount of One Million Nine Hundred Twenty Thousand Dollars ($1,920,000) for accomplishment of the Phase I work described in Section 2.1.1., in accordance with the cost estimate provided in Attachment B to this Subagreement No. 1.

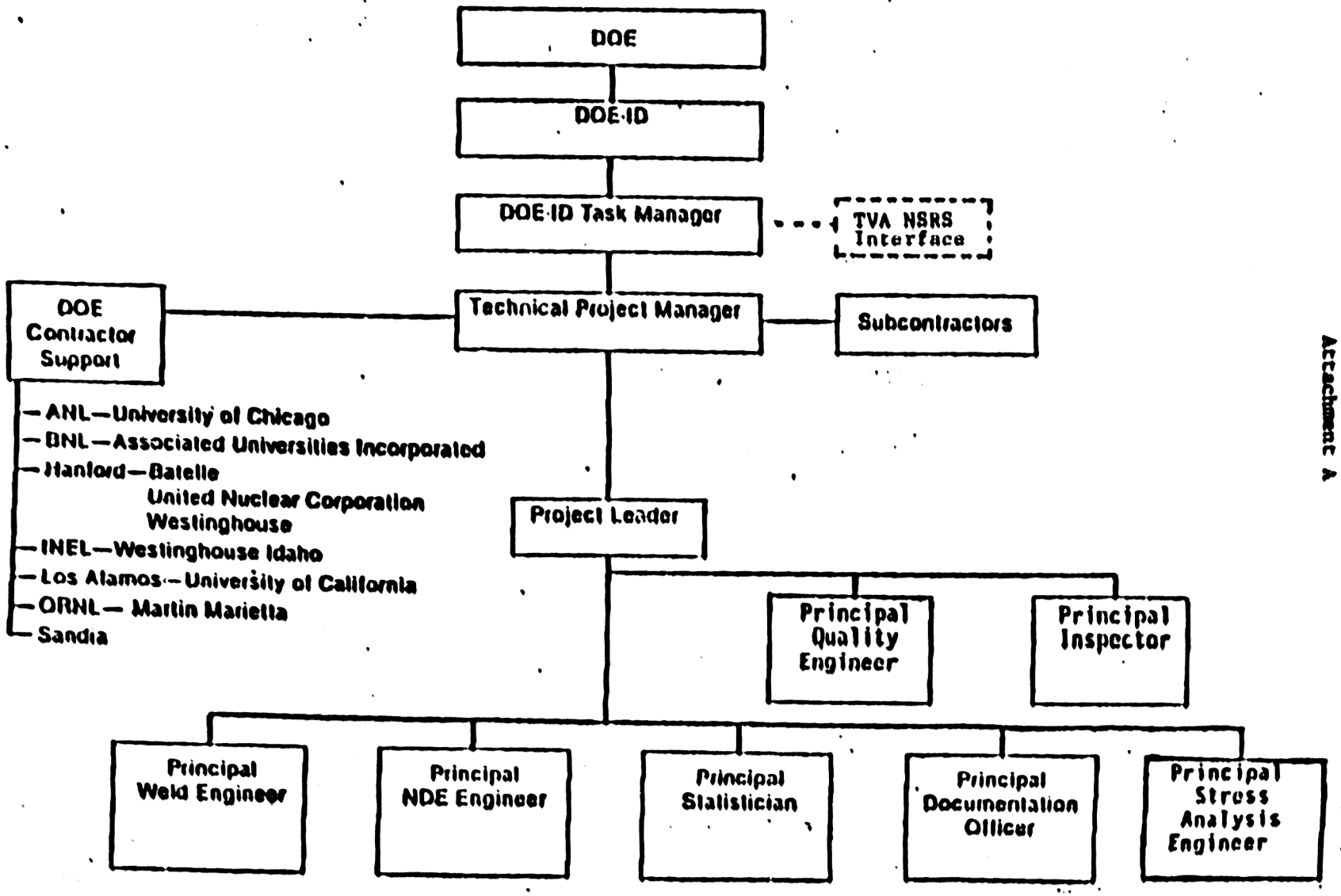
6.0 NOTICES

All notices under this subagreement will be in writing and forwarded to:

Tennessee Valley Authority
Attention: Kermit W. Whitt
Contracting Officer
400 West Summit Hill Drive, E3A8 C-K
Knoxville, Tennessee 37902
(regarding technical matters and matters of contract administration)

U. S. Department of Energy
Attention: R. E. Tiller
785 DOE Place
Idaho Falls, Idaho 83402
(regarding technical matters)

U.S. Department of Energy
Attention: J. F. Marmo
785 DOE Place
Idaho Falls, Idaho 83402
(regarding matters of contract administration)



Attachment A

Attachment B

Phase I Project Cost Estimate

Proposal Costs	$ 85,000
Project Planning Procedures/Management	$ 563,000
Identification of Homogeneous Groups and Populations	$ 550,000
Inspector staffing, training, and certification preparations for Phase II	$ 272,000
	$ 1,470,000
Nonlabor (including travel, per diem living expenses, subcontract handling costs, office supplies)	$ 450,000
	$1,920,000

Appendix 1
Attachment 2

SUMMARY OF THE DEPARTMENT OF ENERGY WELD EVALUATION PROJECT AT WATTS BAR NUCLEAR PLANT UNIT 1

OBJECTIVE

The Department of Energy (DOE) Weld Evaluation Project (WEP) will perform a comprehensive, independent evaluation of the Tennessee Valley Authority (TVA) welding program and welding program results with respect to safety-related welds at the Watts Bar Nuclear Plant Unit 1. The WEP will

1. Assess compliance of the TVA weld program and welding results to the TVA commitments for safety-related welds and communicate to TVA all unresolved weld program deficiencies (if any) and nonconforming safety-related welds for dispositioning by TVA.

2. Provide a basis for dispositioning those employee concerns related to weld quality for which no impact on safety-related weld quality was detected during the assessment.

3. Identify the nonconforming safety-related welds associated with each employee concern related to weld quality for which an impact on weld quality was detected during the assessment and communicate those nonconforming welds to TVA for correction and resolution of the concerns.

For the purpose of this project, safety-related welds have been defined as those that are necessary to ensure:

1. The integrity of the reactor coolant pressure boundary

2. The capability to shut down the reactor and maintain it in a safe condition

3. The capability to prevent or mitigate the consequences of an incident which could result in potential offsite exposures comparable to those specified in 10 CFR Part 100.

TECHNICAL APPROACH

WEP will conduct its assessment of the weld quality at the Watts Bar Nuclear Plant Unit 1 in a logical progression of steps starting with identification of the TVA commitments related to welding quality during construction of Unit 1 and ending with a communication to TVA of any remaining unresolved weld program deficiencies and nonconforming safety-related welds identified during the assessment. WEP will perform the assessment by examining the TVA-performed, safety-related welds and by reviewing the associated weld documentation, utilizing either 100% reexamination or, where appropriate, sampling techniques. In those instances that the TVA welding program failed to meet minimum TVA weld program construction code commitments, WEP will examine the welds to the extent required to comply with those commitments or, with technical justification, the extent of those commitments (up to 100% examination of the welds, if so required by the code commitment or by the intent of the code commitment). If the problem can be associated with specific welds or if the extent of the problem is known to exceed NCIG-02 95/95% acceptance criteria, WEP will examine 100% of the associated welds. Where appropriate and consistent with the above, WEP will statistically examine the associated welds and determine the effect upon weld quality, by using the multiple sampling methodology and 95/95% criterion described in NCIG-02. The examination program will be structured such that all Unit 1 safety-related welds performed by TVA have been represented in the assessment. Where possible, the examination plan will directly measure the weld characteristics specified by the applicable code. If the characteristic(s) cannot be directly measured, WEP will determine an indirect method of measuring the characteristic(s); that method may be more rigorous than the examination method specified by the code, and may include radiographic and ultrasonic Nondestructive Testing (NDT) techniques and, if necessary, destructive testing techniques. TVA will revise the appropriate documentation as required to authorize the use of indirect methods of examination.

The following paragraphs outline in depth the technical approach to be used by WEP.

1. WEP will review the Watts Bar Nuclear Plant Unit 1 Final Safety Analysis Report (FSAR) and design documents to identify the TVA commitments with respect to TVA welding performed on safety systems.

2. WEP will review the welding codes to which TVA has committed to determine the requirements to which Watts Bar Nuclear Plant Unit 1 should have been constructed. Those codes are:

   a. American Society of Mechanical Engineers (ASME)--ASME Section III

   b. American National Standards Institute (ANSI)--ANSI B31 series

   c. American Welding Society (AWS)--D1.1.

   As required, WEP will consult with code committee representatives to ensure that WEP has correctly interpreted the code requirements. All such consultations shall be documented.

3. WEP will review the weld program implementing documents and weld quality records to verify that the procedures used during construction of Unit 1 were performed in compliance with TVA commitments as identified in Items 1 and 2 above. In any instance that the review reveals noncompliance with TVA commitments, WEP will (a) formulate a plan to assess the extent to which the welds meet the commitment requirements or, in cases where it is no longer possible to exactly conform to the commitment requirements, formulate an alternative plan that meets the intent of the commitment requirements, (b) identify the welds/components associated with the deficiency, and (c) perform the weld/component examinations (see Items 7 through 10). (A component is defined for structures as a logical assembly of parts that have a common function, and is defined for piping as a welded joint.)

The examinations performed in this task will be conducted to the extent required to satisfy minimum code requirements, up to 100% examination of the associated weld population.

4. WEP will review the Watts Bar Nuclear Plant Unit 1 "closed out" quality indicators [such as, but not limited to, Nonconformance Reports (NCRs), Management Assessment Reports (MARs), Corrective Action Reports (CARs), 10 CFR 50.55(e) reports, and allegations to NRC which have been made available to TVA] to (a) determine previously identified noncompliances associated with TVA weld quality, (b) determine the corrective programs initiated by TVA, and (c) determine the extent to which the corrective programs were carried out, as verified by the weld records. WEP will evaluate the completeness of the corrective actions taken by TVA to determine whether those actions were adequate for correction of the noncompliances. For those noncompliances determined by WEP to have been incompletely corrected by TVA, WEP will perform a 100% examination of the incompletely corrected welds.

   For each incompletely resolved noncompliance, WEP will determine the indicator characteristics to be used to evaluate the impact on weld quality. WEP will then bound the associated weld population and identify the welds/components within each boundary.

5. WEP will review the "open" quality indicators [all investigated and uninvestigated employee concerns, Quality Technology Corporation (QTC) aggregate assessment of employee concerns, allegations to NRC, etc.] and will confer with QTC and others to determine the problems related to weld quality that may exist in addition to those identified in Items 3 and 4 above. For all such problems, WEP will determine the indicator characteristics to be used to determine the impact of the problem on weld quality. WEP will then bound the weld population associated with each problem and identify the welds/components within each problem boundary. If specific plant welds/components are implicated by the employee concern(s) or if it is known that the extent of the problem exceeds the NCIG-02 criteria, 100% of

those welds/components will be examined. If specific welds/components have not been identified in the concern(s), the associated weld/component population will be statistically examined in accordance with the multiple sampling methodology and 95/95% acceptance criterion described in NCIG-02.

6. To determine if any previously unsuspected problems exist with the quality of TVA-performed welding and to verify that all safety-related welds performed by TVA are represented in the evaluation, WEP will separate all TVA-performed, safety-related welds/components into homogeneous groups based on common welding processes and time intervals of uniform weld program requirements. (Homogeneous groups are defined as bounded populations of welds/components that have common characteristics such as an identified or suspected problem, a common welding process, etc.) The resultant homogeneous groups will be statistically examined in accordance with NCIG-02 methodology. That examination will include all TVA welding program commitments and the visual NDE acceptance criteria required by TVA weld program construction commitments or, where that is not possible, alternative criteria that meet the intent of those commitments. The common welding processes are:

	Description
Group 1:	Welds produced by shielded metal arc (SMAW) process in carbon and low alloy steel piping systems (ASME)
Group 2:	Welds produced with a gas tungsten arc welded (GTAW) root pass with SMAW intermediate and final passes in carbon and low alloy steel piping systems (ASME)
Group 3:	Welds produced with a GTAW root pass with SMAW intermediate and final passes in stainless and other high alloy steel piping systems (ASME)

Group 4: Welds produced by the GTAW process in piping systems of all materials (ASME)

Group 5: Welds produced by the SMAW process in rigorously analyzed supports (AWS D1.1)

Group 6: Welds produced by the SMAW process in alternatively analyzed and hand calculated supports (AWS D1.1)

Group 7: Welds produced by the SMAW process in "typical" supports (AWS D1.1)

Group 8: Welds produced by the SMAW or GTAW processes in HVAC ducting systems.

The time intervals of uniform weld program requirements have not been identified at the time of writing this document.

After the homogeneous groups have been bounded, the welds/components within each problem boundary will be identified. Either 100% of the weld population will be examined or, if appropriate, sample populations will be randomly selected from the homogeneous groups. The sample populations will be sufficiently large to allow two expansions of sample size, based on a 95/95% multiple sampling methodology following the removal of inaccessible welds/components from the sample populations as described in NCIG-02.

7. WEP will review the welds/components selected for examination in Items 3, 4, 5, and 6 to identify those welds/components that appear in two or more homogeneous groups. The intent of this review is to prevent multiple examinations of a single weld/component. Examination plans will then be developed for each weld/component such that all required problem indicators are included in the examinations.

8. WEP will conduct weld/component examinations and review the associated quality documentation. As previously discussed, certain groups will be statistically examined; those groups will be examined and accepted in accordance with the multiple sampling methodology and 95/95% criterion described in NCIG-02.

   WEP will provide TVA with a listing of all weld program deficiencies and weld noncompliances noted during performance of the examinations.

9. TVA will perform engineering analysis on deficient weld characteristics. WEP will review and concur with the TVA analyses to ensure the appropriateness of the methodology, the accuracy of the calculations, and the correctness of the conclusions.

10. WEP will review the noncompliances associated with each statistically examined group to determine acceptance of the group in accordance with NCIG-02 methodology.

11. WEP will perform root cause and generic problem analysis on the aggregate of the examination results to determine if any previously unsuspected problems may exist.

12. WEP will identify additional populations as required to identify generic problems and will develop an examination plan for removal of those generic problems.

13. WEP will provide TVA with a report that identifies the employee concerns related to weld quality for which no impact on weld quality was detected during the assessment. The report will form the basis for dispositioning employee concerns by TVA.

14. WEP will provide TVA with a report that identifies the nonconforming welds associated with each employee concern for which an impact on weld quality was detected.

PROJECT QUALITY ASSURANCE

The work performed by WEP will include an ongoing quality assurance program. That program, which complies with NQA-1, will include internal quality overview by WEP management and external quality overview by an independent organization reporting to the Program Operations Evaluation (POE) Manager at EG&G Idaho. A comprehensive readiness review of WEP will be conducted by DCE-ID or by a designated alternate prior to performing the weld reexaminations to demonstrate that WEP is ready to perform examinations in accordance with requirements.

KEY ASSUMPTIONS

1. WEP shall confine its work to the scope identified within the management plan. The management plan will be appropriately revised if a need to change the work scope is identified. The work performed by WEP will be limited to an examination of the weld quality of the safety systems associated with the Watts Bar Nuclear Plant Unit 1. Further, the evaluation performed by WEP will be limited to welding performed by TVA and will exclude welding performed on the base foundation (e.g., reinforcing rod). The work scope is based on the assumption that weld requirements associated with engineered characteristics are correctly described on design documents.

2. WEP shall independently define the quality problems, component populations associated with the quality problems, reexamination acceptance criteria, performance of examinations, interpretation of examination results, generic problem evaluation, direction on generic and specific resolution of noncompliances. WEP may, at its option, use data supplied by TVA, but only after WEP has verified that data to be correct.

3. Members of WEP may informally discuss the nature of their work with NRC personnel. WEP personnel will inform TVA of any such discussions. Any formal discussion with NRC will be coordinated through TVA.

4. Members of WEP will be able to freely communicate with QTC personnel. TVA will be notified of any formal meetings between WEP and QTC.

5. Watts Bar Plant Unit 1 will be accessible to WEP personnel for reexamination of welds.

6. TVA will configure the Watts Bar Plant Unit 1, as required, for reexamination of the sample population of welds, as randomly

selected by WEP. Further, TVA personnel shall prepare the plant for examination of those welds selected for evaluation by WEP. Preparation means removal of insulation or other protective coatings, draining of water or other fluids from components, and providing working access to the component location, as required. Once a system or portion of a system has been prepared for examination, the configuration of the welds to be inspected and the conditions established for the examination will not be changed until WEP has completed its examination activities associated with the associated welds/components.

It is recognized that, to support other commitments, TVA may be required to modify safety-related plant systems or components during the course of the Weld Evaluation Project. If the plant configuration is changed after welds/components have been identified for examination, but before those welds/components have been prepared for examination, the affected welds/components will be removed from the examination population or replaced with other randomly drawn samples, as appropriate for the degree to which the respective homogeneous group is to be examined.

7. WEP personnel shall perform all visual, liquid penetrant, and magnetic particle weld inspections. WEP-qualified TVA personnel shall set up and operate all equipment for radiographic examination. Qualified WEP personnel shall observe radiographic examination data collection.

8. With regard to the DOE-WEP assessment, WEP will be the final authority as to whether a component is in compliance following reexamination and, when applicable, engineering analysis activities.

9. All WEP examiners will be qualified by WEP for visual and nondestructive examination techniques. Nondestructive qualification shall be based on ASNT-TC-1A criteria. Visual examiners shall be certified weld inspectors (CWI) in accordance

with the AWS code with additional qualification per NCIG-01/-03 examination criteria.

10. WEP will be staffed by DOE contractor personnel and, if required, by other subcontracted experts.

11. WEP will be provided with all documentation necessary to complete its task, including but not limited to the following:

    - Current FSAR

    - Design drawings and specifications for all safety-related systems (designs shall describe the component installation details and details of components for all safety systems; the drawings shall represent the as-built plant at the time of the weld system evaluation. As-built drawing may include red line changes)

    - Access to procurement documents and work authorization files to determine components that were welded or partially welded by TVA personnel

    - Employee concerns, NCRs, CARs, 10 CFR 50.55(e) reports, allegations to NRC, and NRC findings associated with the TVA weld system

    - Documents that describe the weld system and implementation documents, management assessment reports of the weld system, and, to the extent possible, charts for organizations performing welding or weld examination activities and changes thereto during the entire construction period (1972 to present)

    - Documents used to authorize welding and examination activities for all welds being examined, including nonconformance reports describing resolution of noncompliances

- Reports of all weld reexaminations performed since the initial examination.

12. The design drawing and specification documents provided to WEP shall be those that have been submitted to the NRC as part of the request for licensing.

13. TVA will perform all stress analyses to determine the safety significance of nonconformances of engineered weld characteristics. WEP shall review and approve those analyses to assure that they contain sufficient detail such that a technically qualified individual can review and understand the analysis, verify the adequacy of the analysis without recourse to the originator, and approve the analysis.

14. TVA will supply WEP with the plant design baseline. Changes to those baseline documents shall be maintained by TVA in accordance with TVA document control requirements.