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

December 5, 1986

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

The purpose of this letter is to (1) respond to NRC letters dated July 24 and October 14, 1986, (2) inform you of recent personnel and organizational changes in the TVA welding project, and (3) summarize key TVA actions on welding issues at Watts Bar Nuclear Plant (WBN). Enclosure 1 contains the responses to the questions raised in your letters. Items (1) and (3) are based on TVA efforts to date and on information supplied by DOE/EG&G through November 21, 1986. This is an ongoing effort, and you will be kept informed as the program progresses.

Since our meeting on June 25, 1986, TVA has made several changes in the management and organization affecting the Welding Project to recognize the lead role which should be taken by TVA's Division of Nuclear Engineering. The project has been transferred to Engineering and Technical Services in the Division of Nuclear Engineering. C. D. Lundin (Stone & Webster Engineering Corporation) has been appointed as the Manager of the TVA Welding Project. Also, TVA has secured the consulting services of three nationally recognized experts in the field of welding. The consultants have reviewed and are in agreement with the enclosures and attachments of this letter. Summaries of the professional experience of these consultants are in Enclosure 2.

The purpose of the TVA weld reevaluation program is to determine if the welding program was conducted in accordance with FSAR commitments and if welded components and structures will perform their intended functions. Deviations from FSAR commitments will be documented, evaluated together with applicable corrective actions, and the basis for acceptability will be submitted to NRC for approval. Specifically, TVA intends to repair all

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physical deviations from FSAR commitments or, in those cases where repair is not feasible, TVA will seek NRC approval provided the welds can be shown to be suitable for intended service. All questions on acceptance under applicable codes will be resolved by TVA on an individual case basis.

We agree that the rejection rates could also be reported in a way consistent with that used by your staff. TVA is tabulating the data report information in several forms, one of which is consistent with that used by your staff. In addition, TVA is evaluating this data utilizing various tabulations (e.g., by significant attributes, loading, etc.) to better understand the implications of the identified deficiencies. Conclusions drawn from this evaluation will also address quality-related issues such as welder and inspection program adequacy.

TVA is totally committed to the implementation of the requirements of 10 CFR Part 50, Appendix B. The welding reinspection results are undergoing thorough review to determine where QA weaknesses may have existed and how programmatic improvements can be made. To date TVA has discovered significant deficiencies in the welding QA program at WBN in two specific areas. Both of these were discussed briefly at our November 18 meeting in Chattanooga. They involve (1) weld deficiencies in one structural platform at elevation 741.0' supporting safety-related cable trays and (2) the interpretation of code required radiographs. TVA will repair all deficient welds found in welded connections on elevation 741.0' structural platform (see Enclosure 3). All radiographic indications requiring evaluation will be analyzed and reported as applicable along with appropriate corrective action (see answer to question 15 in Enclosure 1). These are instances where the QA program, or its implementation, did not provide adequate confidence that TVA's licensing commitments were fully met. In addition, other issues have been identified and reported which have required and will require rework and are covered in TVA's previous commitment to continuing review of QA activities. These issues will be described in more detail in Volume IV of TVA's Nuclear Performance Plan.

TVA is taking aggressive actions to address the welding issues and, as previously stated, has substantially redirected the entire WBN welding program. We recognize the urgency and importance of dealing

crisply with these welding issues, and we believe that technical meetings between our staffs will be productive in reviewing details of this program. Accordingly, we plan to call the NRC regarding suitable meeting arrangements.

If you have any questions regarding this response, please get in touch with R. H. Shell at (615) 751-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

C. C. Mason
Acting Manager of Nuclear Power

Enclosures
cc (Enclosures):
U.S. Nuclear Regulatory Commission
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT - RESPONSE TO NRC WELDING QUESTIONS - YOUNGBLOOD TO WHITE, DATED JULY 24, 1986 AND VOLLMER TO WHITE, DATED OCTOBER 14, 1986

NRC Question (July 24 #1 and October 14 #1)

1. Provide a listing of the population groups selected for reinspection, including the basis for the establishment of each population and sample selection. Link specific employee concerns to the applicable populations. Also provide a list of systems/areas which were not included in the populations established for reinspection and the basis for not including the system(s) in any of the populations established for reinspection. Describe your safety classifications and their correlations with NRC classifications.

TVA Response

1. TVA Response (Question 1, 1st sentence)

Question 1, attachment 1, Master Listing of Weld Evaluation Project (WEP) Identified Homogeneous Groups, provides the requested listing of population groups and question 1, attachment 2, Justification for Group Formation, provides the requested basis for population establishment. The term group in these documents is synonomous with the word "population."

TVA Response (Question 1, 2nd sentence)

Question 1, attachment 3, "Standard Practice WEP 3.1.3," defines the methodology employed to place employee concerns into groups. Question 1, attachment 4, "The Category/Description" document, defines the categories of employee concerns which are included in the data base and links the concern to the group in which it was placed.

TVA Response (Question 1, 3rd sentence)

The reinspection program is currently based on populations which include all safety-related systems and areas. All safety-related systems and areas were intended to be included in the populations established for reinspection. Subsequent to original group formation, it was determined that there were three categories of components that were not in the sample data base. These have now been included and scheduled for examination. To increase confidence that all safety-related systems and areas are now included, a statistical sampling program is being conducted in the plant to verify that all safety-related plant welds are in the data base. This program is 80% complete and completion is expected in early 1987..

TVA Response: (Question 1, 4th sentence)

1) Paragraph 3.2.2 of the WBN FSAR (Amendment 59) addresses the TVA piping classifications as follows:

3.2.2 System Quality Group Classification

Fluid system components for the Watts Bar Nuclear Plant (WBN) that perform a safety function are identified by TVA Classes A, B, C, or D. These piping classes are assigned to fluid systems based on the ANS Safety Classes 1, 2a, 2b, and 3, respectively, which are assigned to nuclear power plant equipment according to the August 1970 Draft of ANSI N-18.2, "Nuclear Safety Criteria for the design of Stationary Water Reactor Plants." The ANS safety classification of each component has been considered in the various aspects of design, fabrication, construction, and operation.

In addition, TVA's General Design Criteria No. WB-DC-40-36 and WB-DC-40-36.1 address the major safety-related systems and their safety classes, TVA classifications and code requirements. The following is a summary of the design criteria indicating the classifications that are included in the WEP program for WBN Unit 1.

Safety Class ANS, N-18.2	TVA Class	Seismic Category	Code Classification Piping, Pumps, Valves, and Vessels	
1	A	I	ASME Code, Sec . III, Class 1	
2a	B	I	ASME Code, Sec . III, Class 2	
2b	C	I	ASME Code, Sec . III, Class 3	Note (1)
3	D	I	ASME Code, Sec . III, Class 3	
-	G	I(L)	ANSI B31.1	
-	H	Note 2	ANSI B31.1	Note 3
-	J	-	-	Note 3
-	K	I(L)	-	
-	L	Note 2	-	Note 3

Safety Class ANS, N-18.2	TVA Class	Seismic Category	Code Classification Piping, Pumps, Valves, and Vessels
2b (See note 4)	M	I or I(L)	ANSI B31.5
None	N	Note 5	ANSI B31.5
2b (See note 4)	Q	I or I(L)	Round Duct, Steel, Spiral or Longitudinal Locked or Welded Seam, ASTM A 211 and SMACNA High Velocity Duct Construction Standards, 2nd Edit., 1969, as modified by ORNL-NSIC-65 para 2.8.
2b (See note 4)	S	I or I(L)	Rect. Duct, Steel, Spiral or Longitudinal Locked or Welded Seam, SMACNA High Velocity Duct Construction Standards, 2nd Edit., 1969, as modified by ORNL-NSIC-65 para 2.8.
None	U	1(L)	Round Duct, Steel, SMACNA Low Velocity Duct Construction Standards, 4th Edit., 1969.
None	V	1(L)	Round Duct, Steel, SMACNA Low Velocity Duct Construction Standards, 4th Edit., 1969.

1. ANSI B31.1 code is an acceptable substitute for the ASME Code for installation of piping and valves on class C Instrument Lines attached to TVA Classes M, Q, and S systems 10 CFR 50, Appendix B, will apply as delineated in N3M-868.

2. Those portions of TVA Class H and L systems, located inside seismic Category I structures, are seismic Category I(L) for pressure boundary integrity or position retention as required. The balance of the system is not designed for seismic loading.

3. Design engineers shall determine the specific code or standard (i.e., TEMA, API, etc). Note that equipment in TVA classes G and K is to be installed in seismic Category I structures and should be of a design quality that reflects its safety-related aspects.

4. TVA Classes M, Q, and S, designations are also used for HVAC systems which have no ANS Safety Class requirements if seismic requirements are invoked.

5. These portions of TVA class N systems, located inside Seismic Category I structures, are Seismic Category I(L). The balance of these systems is not designed for seismic loading.

NRC Question (July 24 #2 and October 14 #2)

2. Your handouts for the June 25 meeting provided flowcharts for assessment and disposition, multiple sampling plans, generic problem analysis, project procedures, etc. Provide a full description of each "logic block" and its relationship to preceding and following blocks. In addition, provide an example of the operation of the block with a specific problem. In particular, discuss the conditions that would result in an expansion of the sample size and the conditions that would result in 100% reinspection of given population.

TVA Response

2. The WEP technical approach being implemented at this time differs somewhat from the description and logic in the May 19 Project Management Plan (PMP) and the presentation and handouts provided at the June 25, 1986, meeting in Bethesda. Question 2, attachment 1, is a description of this approach with examples as requested. Since the June 25 meeting, TVA has gathered sufficient data to initiate an assessment of aggregate examination results and identify some specific and general corrective actions. This activity is in progress and may determine additional program changes necessary to better facilitate final assessment and definition of corrective actions. NRC will be kept aware of any further changes to the program.

NRC Question (July 24 #3 and October 14 #3)

3. The staff does not accept your position in the Project Management Plan that a demonstration that welds are "suitable for service" on a statistical 95/95 basis; i.e., 95% confidence level that 95% of welds in a given population are "suitable for service," is equivalent to your FSAR commitment to meet specific industry codes and standards unless specifically provided for in the individual codes. Such deviations, and your evaluation, must be documented and approved by the staff. For each homogeneous population group, you must make a finding first whether original commitments have been implemented. If the original commitments have been implemented, you must identify the deviations, document your evaluations, and provide the basis for their acceptability for staff review and approval. In determining whether you have implemented your commitments, a distinction must be made between the programmatic aspects and the field implementation of your program. Necessary corrective action also needs to be defined.

TVA Response

3. TVA never intended to use its Weld Evaluation Project (WEP) to demonstrate that suitability for service on a statistical 95/95 basis is equivalent to meeting FSAR commitments. TVA will determine if unevaluated deviations from code criteria may have occurred. If deviations are found, the safety significance of each deviation will be assessed. TVA will assure that each deviation has been evaluated to determine if the weld is suitable for service or if it needs to be repaired. This evaluation including any necessary corrective action will be fully documented. Any such deviation that cannot be accommodated by the code, that TVA does not plan to repair, will be identified and the justification for not changing it will be submitted for NRC staff review and approval.

   TVA will make the distinction between the programmatic aspects and field implementation of the TVA program. Also see response to question 4.

NRC Question (July 24 #4)

4. In the June 25, 1986 meeting, when the specific issue regarding fit-up inspection was discussed, your contractor stated that QA/QC aspects related to welding are not included in the scope of the DOE/EG&G review. The staff believes that, in order to make a finding whether original licensing commitments have been met, QA/QC aspects must be included and addressed. Because QA/QC aspects related to welding are presently not included in your Project Management Plan for welding, discuss how you intend to factor QA/QC aspects into your determination whether you have implemented your original commitments; i.e., you have in place procedures that meet the 10 CFR 50 Appendix B and applicable ANSI N45 series standards and that these procedures have been executed in the field.

TVA Response

4. Apparently there has been a misunderstanding regarding the examination of QA/QC aspects of TVA's program generated by statements in the June 25, 1986 meeting. The programmatic review included both technical and QA/QC requirements to ensure they had been appropriately included in the procedures. The review of the implementation of these procedures (including QA/QC aspects) was not a specific task of the program. Instead, the results achieved, i.e., the quality of the installed hardware, was deemed a more relevant test. However, because the question has been raised by the NRC, an additional task to specifically address this question has been added to test the implementation by evaluating the conduct and results of the audit and corrective action portions of QA program as applied to welding at WBN. In addition, the fitup issue is being addressed by a special program.

NRC Question (July 24 #5)

5. Provide a schedule for the activities covered by the Project Management Plan.

TVA Response

5. A revised schedule will be formally transmitted to the NRC in early 1987.

NRC Question (July 24 #6)

6. Discuss the possible application of this plan to Watts Bar Unit 2.

TVA Response

6. TVA will utilize the results and lessons learned from unit 1 in developing the specific plan for unit 2.

NRC Question (July 24 #7 and October 14 #4)

7. On page 45 of the June 25 meeting transcript, 3,000 quality indicators were stated to affect welding at Watts Bar unit 1, and that these 3,000 indicators were reduced to 122 categories of potential problems. Discuss the sources of the quality indicators and identify the 122 categories that are being addressed in this plan.

TVA Response

7. Approximately 8,000 documents deemed "quality indicators" were reviewed, representing 12 years of construction and over 400,000 welds in WBN Unit 1. Of these, approximately 3,000 quality indicators were relevant to welding. The sources of these quality indicators and the number of categories that are being addressed are summarized in question 7, attachment 1.

   The reference in the transcript of the June 25 meeting to the 122 categories pertains to the 134 (updated correction from 122) different individual quality indicators as shown in question 7, attachment 2.

NRC Question (July 24 #8 and October 14 #5)

8. As specific employee concerns regarding welding are resolved by population group, provide applicable subcategory reports periodically to allow for a progressive evaluation of your results.

TVA Response

8. Because of the method used to evaluate employee concerns, it is unlikely that we will be able to close some concerns in any one subcategory until the examination results are known for the majority of the homogeneous groups being evaluated. In an effort to improve TVA/NRC communications and understanding in this area, it is desirable that we discuss the issues as frequently as possible; but, we will, as a minimum, report on the progress of group closures monthly. As the specific concerns are resolved by population/group, subcategory reports will be provided periodically to allow for a progressive evaluation of the results.

   Currently, 31 group closure reports have been submitted to TVA and are being restructured into the agreed upon format. Four of the 31 have completed the formatting and are in our final review, and we anticipate providing these to the NRC in mid-December 1986.

NRC Question (July 24 #8 and October 14 #6)

9. How are inaccessible welds to be addressed in each population?

TVA Response

9. For each group, a list of 200 randomly selected components is generated. For an infinite size population, the sample consists of the first 64 components on that list. If a component from the original sample is determined to be inaccessible (less than 100% of the welds accessible for examination of 100% of the required attributes), it is eliminated from the sample and replaced with the next accessible component on the list of randomly selected components.

   For populations where frequent replacements occur, the final sample population will be evaluated to determine if removal/replacement of inaccessible components has biased the sample. If a bias has been introduced because of inaccessibility, the 100%/100% accessibility criterion may be decreased or additional accessible samples may be obtained from the group.

NRC Question (July 24 #10)

10. What were the Preservice Inspection (PSI) results for Watts Bar Unit 1? Are the results of this PSI to be incorporated in this Welding Project Plan?

TVA Response

10. The PSI for unit 1 is approximately 95 percent complete at this time. Any rejectable indications on piping and hanger welds have been dispositioned in accordance with plant procedures. Approximately 1,700 ASME III-1 and III-2 TVA and vendor welds were Preservice Inspected on WBN Unit 1. This inspection resulted in about 131 "Notices of Indication (NOI)." 130 were written on surface conditions such as arc strikes, linear indications, weld spatter, tool and grind marks, punch marks, and gouges, all of which were nonrelevant or insignificant and removed by buffing or light grinding. Only one NOI was a result of a volumetric inspection and was in the vendor seam weld of a fitting and will be addressed in the PSI/ISI Program. Approximately 860 class 1 and class 2 hangers were PSI inspected. This resulted in two NOIs. Both indications were insignificant and were removed by buffing.

    The PSI results are not a direct input to the Weld Evaluation plan; however, the results of the WEP will be compared against PSI results for correlation on completion of project. In addition, due to the identified problem with interpretation of code required radiographs (see question 15 response), a specific review will be performed to compare these NOIs with the deficiencies found.

NRC Question (July 24 #11)

11. Describe the internal procedures for the Employee Concern Task Group addressing assignment of concerns, identification of issues, closing of issues, etc., as discussed on page 129, line 21, through page 130, line 10 of the June 25 meeting transcript.

TVA Response

11. Receipt, processing and evaluation of employee concerns are described in Employee Concern Task Group (ECTG) procedure C.1 which is summarized below.

    1. Received concerns are verified for accountability and are then reviewed to ensure that all sensitive information relating to the identification of the concerned individual has been removed.

    2. Concerns are assigned to appropriate categories based on the category definitions provided in Program Procedure, ECTG M.1. If assigned to more than one category, the ECTG Program Manager designates a lead Category Evaluation Group (CEG) for the shared concern. This designation is noted in the Employee Concern Program data base.

    3. The concern documents, along with any other available information, are forwarded to the appropriate CEG for further division of concerns into subcategories and elements and for evaluation of concerns based on issues identified.

Reporting of Evaluation Results and Corrective Action are summarized in ECTG procedures C.2 and C.3, respectively, and are briefly summarized below.

1. Reports are prepared describing evaluation results. The reports include Corrective Action Tracking Documents when evaluations indicate corrective action is required.

2. Responsible TVA managers review the Corrective Action Tracking Documents (CATDs) and the associated ECTG Report to evaluate actions necessary to prepare a proposed corrective action plan.

3. For safety-related CATDs, the responsible TVA manager initiates appropriate quality assurance program deficiency document(s). The CATD number is noted on the document and a copy of the CATD attached to it. Likewise, a copy of each such deficiency document is attached to the CATD and the document's number noted on the CATD.

4. The ECTG reviews the corrective action plan for acceptability in correcting and precluding recurrence of the identified problem.

5. The ECTG Program Manager reviews the proposed corrective action and, if satisfactory, signs the CATD noting concurrence.

6. The Senior Review Panel (SRP) reviews the proposed corrective action and, if satisfactory, the SRP signs, noting concurrence and returns it to the ECTG Program Manager.

7. If concurrence is not achieved and a satisfactory resolution cannot be reached between the ECTG or the SRP and the responsible organization, the ECTG Program Manager escalates the matter for resolution by the Manager of Nuclear Power.

8. For safety-related CATDs, the tracking and closeout are accomplished via the quality assurance program deficiency document that was initiated.

9. For new safety-related CATDs, the ECTG tracks and closes out the approved corrective action and verifies satisfactory implementation. Nonquality-related CATDs that are not completed before the ECTG is disbanded will be tracked, followed-up, verified and closed out by the ONP ECP Manager.

NRC Question (July 24 #12)

12. Provide a copy of your report on magnetic particle inspection through paint for the detection of cracks. Also describe your means of qualifying inspectors for this procedure.

TVA Response

12. At the time of the June 25 presentation to the NRC, magnetic particle inspection through paint was being investigated for possible application at Watts Bar Nuclear Plant unit 1; however, it could not be qualified for the entire range of weld coatings used by TVA. Therefore, magnetic particle inspection of welds through paint is no longer being considered.

NRC Question (July 24 #13)

13. Provide your detailed plan (including a schedule) for addressing welds in vendor made components.

TVA Response

13. Vendor Welds

Specific concerns related to vendor welding will be evaluated under the existing Employee Concern Program by the QA/QC group. In conjunction with this review, TVA Division of Nuclear Quality Assurance will perform an evaluation of the remaining vendor welds. This will be accomplished in part by evaluating generic employee concerns, past TVA quality indicators and industry experiences with specific vendors.

Planned completion of this review is April 1987. (See question 13, attachment 1)

NRC Question (July 24 #14)

14. Regardless of the status of your ANI inspections, the staff considers Watts Bar unit 1 still under construction. Therefore, Section III, not Section XI, of the ASME B&PV Code is still applicable for any modifications or testing of ASME scope components. For each deviation from Section III, you must identify the deviation, evaluate the deviation, provide the bases for acceptance, or any corrective action, and submit the findings for staff review and approval.

TVA Response

14. It is TVA's position that all fabrication, inspection, installation, and pressure testing (except for piping/components that are not isolable from the primary loops and steam generator secondary side) will be performed to the requirements of ASME III and certified on ASME XI NIS 1 or NIS 2 DATA REPORTS. For each deviation from Section III, TVA will identify the deviation, evaluate the deviation, provide the bases for acceptance or any corrective action, and submit the findings for staff review and approval.

TVA also recognizes the NRC concern as to the processing of all work packages on ASME piping and has discussed these concerns with NRC representatives. TVA has followed the code rules regarding the jurisdictional transfer from ASME Section III to ASME Section XI which occurs on a component or piping system basis during the plant construction phase. A transition between ASME III and ASME XI normally occurs when Section III work is completed on a component and is evidenced by the manufacturer certifying the required Code Data Report and applying the ASME N stamp. The owner certifies completion of all ASME III plant work by certifying the owner's N-3 Data Report when the last ASME III component has been certified and N stamped by the manufacturer. All ASME III components required to be certified and stamped at Watts Bar unit 1 have been completed, and the owner's N-3 Data Report has been certified. Plant modifications subsequent to ASME III certification which enhance system operation or maintenance, but which are not part of the original design basis, would normally be performed under ASME XI in all power plants up to fuel load and beyond.

This transition between ASME III and ASME XI is usually clear cut and irreversible; however, TVA recognizes the unusual nature of the repair and modification work being done and the reviews being performed at Watts Bar subsequent to code certification, but prior to licensing. Therefore, TVA proposes that an augmented ASME XI program be followed which provides the administrative controls of ASME XI but considers the technical provisions of ASME III. Essentially all fabrication, inspection, installation, and pressure testing (except for piping/components that are not isolable from the primary loops and steam generator secondary side) will be performed to the requirements of ASME III and certified on ASME XI NIS 1 or NIS 2 DATA REPORTS.

As of July 21, 1986 modifications performed under the rules of ASME XI have been evaluated as to whether or not it would be prudent to invoke provisions from the rules of ASME III. The basic outline of this evaluation is as follows:

For Future Work (For Unit 1 repairs and modifications after July 21, 1986 and prior to licensing).

Piping/components which are not isolable from the primary loop and steam generator secondary side will be fabricated, inspected, and installed to the requirements of ASME III and tested to the requirements of ASME XI.

For Past Work Completed to ASME XI Requirements (Prior to July 21, 1986)

TVA does not consider it practical or necessary to remove and reinstall plant systems to merely provide for the in-process inspection required by Section III unless repair or modification is required.

NRC Question (July 24 #15)

15. With respect to the issue related to your preliminary findings on the radiographs for the ASME scope welds, the staff considers them extremely significant. The staff also understands that you have issued a Request for Proposal (RFP) for a reassessment of approximately 1,500 radiographs. Provide a status summary of your investigation to date and a copy of your RFP.

TVA Response

15. As part of the review, approximately 400 radiographs representing 86 welds were reevaluated. The review identified indications in two welds. Further investigation by TVA, including additional radiography, identified one additional indication. These indications were found in radiographs originally evaluated by a single inspector. One hundred percent of the radiographs associated with this inspector involving 1,784 welds and representing approximately 8,000 radiographic shots is currently being reviewed under a contract (awarded to Hellier and Associates) resulting from the RFP.

Of the radiographs reviewed to date, approximately 171 welds have at least one shot having indications requiring evaluation. TVA is currently evaluating these indications and has reported this condition as potentially reportable under Significant Condition Report SCR WBN NEB 8651, called in to NRC on November 26, 1986.

Pending the results of some ongoing reradiography to evaluate the performance of other film interpreters, TVA is developing a plan to review 100% of the remaining final radiographs on Unit 1.

QUESTION 1

ATTACHMENT 1

MASTER LISTING AND STATUS OF

WEP IDENTIFIED HOMOGENEOUS GROUPS

Group Numbering System/Origin	
Specific Groups: (Numbers 1-200)	Formulated from Employee Concerns; Designation: EC-SP-XX
	Formulated from Quality Indicators; Designation: QI-SP-XX
Special Groups: (Numbers 201-400)	Formulated from Employee Concerns; Designation: EC-SPL-XX
	Formulated from Quality Indicators; Designation: QI-SPL-XX
	Additional Evaluation Groups; Designation: EX-SPL-01, 02, 03, etc.
General Groups: (Letters A-M)	General Plant Overview; standard post-weld inspections/NDE and documentation review.

Approval: A. C. Bradford 10/1/86
Date

ORIGINAL

	Items/Groups	Associated Documents
1. (EC-SP-1)	The nine welds in the Unit 1 pipe whip restraints in the North Valve room identified by QTC on drawings 48W1708-03 (R14) and -04 (R13). Examine associated weld documentation for evidence of repair by TVA. If there is no evidence that this problem has been suitably resolved, physically examine using an inspection/NDE technique appropriate for detecting subsurface cracks. PROBLEM/SUBJECT: POSSIBLE SUBSURFACE DEFECTS.	IN-86-297-001/06B15/6.C
2. (EC-SP-2)	The Unit 1, safety-related fire protection system weld-o-lets to header pipe welds in the control building stairway going to the southeast office by the spreader room. Evaluate for insufficient weld material using visual inspection. PROBLEM/SUBJECT: WELDS DO NOT MEET ACCEPTANCE CRITERIA.	IN-86-093-001/06B48/6.B
3. (EC-SP-3)	The Unit 1, safety-related welds on beam A15-K, 733' 10" elevation in the South valve room. Evaluate using the inspection/NDE technique appropriate for the detection of slag inclusion and subsurface cracks. PROBLEM/SUBJECT: POSSIBLE SUBSURFACE DEFECTS.	IN-86-032-001/06A17/6.C
4. (EC-SP-4)	Unit 1, safety-related box anchor welds. WEP will evaluate the box anchors on the ECRW line in the auxiliary building at the 713 foot elevation using an inspection/NDE technique appropriate to detect slugged welds. PROBLEM/SUBJECT: SLUGGED WELD.	WI-85-035-004/06B42/6.C
5. (EC-SP-5)	Non-vendor welds in safety-related systems buried below the Unit 1 reactor building. DOE/WEP will determine which welds are involved and evaluate the associated documentation. NOTE: QTC verified that the welds are in Systems 1, 3, and 7, and were made by TVA welders. PROBLEM/SUBJECT: MISSING DOCUMENTATION.	IN-86-155-003/05B18/5.C.1
6. (EC-SP-6)	The safety-related, Unit 1 welds associated with 14-inch stainless steel pipe off the Residual Heat Removal (RHR) pumps. Evaluate using an inspection/NDE technique appropriate for the detection of reduced wall thickness. NOTE: The location specified was provided by QTC in response to a DOE/WEP request for specific location. PROBLEM/SUBJECT: SURFACE CONDITION/VIOLATION OF MINIMUM WALL.	IN-85-299-003/09B03/9.C.3

ORIGINAL

	Items/Groups	Associated Documents	
7. (EC-SP-7)	18 inch carbon steel pipe, located in the reactor building, 713' elevation, near the personnel/equipment hatch. Perform visual examination of base metal adjacent to welds for evidence of arc strikes and/or excessive metal excavation. PROBLEM/SUBJECT: UNREPAIRED ARC STRIKE.	IN-85-080-001/04B02/4.A	
8. (EC-SP-8)	System 78 piping, auxiliary building, 732' elevation near A7 and "V" or "U" wall. Perform visual examination of base metal adjacent to welds for evidence of arc strikes and/or excessive metal excavation. PROBLEM/SUBJECT: UNREPAIRED ARC STRIKE.	IN-85-460-X04/04B03/4.A	
9. (EC-SP-9)	10 inch stainless steel piping, System 72, auxiliary building, 713' elevation in heat exchanger room 1A. Locate subject arc strike/excavation area, examine and record as found condition. Compare existing conditions to inspection records and evaluate documentation. PROBLEM/SUBJECT: EXCESSIVE MATERIAL EXCAVATION.	IN-85-460-X05/04A01/4.B IN-85-270-001/04A04/4.B	IN-85-246-002/04A03/4.B IN-86-133-001/04A05/4.B
10. (EC-SP-10)	The two circumferential welds on the Unit 1 main steam impingement sleeve located in the yard adjacent to the auxiliary building (refer to marked isometric drawing provided with OE calculation report B41-851010-0002). DOE/WEP has determined that the impingement sleeves are safety-related and will evaluate the associated TVA analysis to determine if further physical examination is appropriate. PROBLEM/SUBJECT: POSSIBLE SUBSURFACE DEFECTS, SLUGGED WELD.	HI-85-049-001/06B47/6.C	IN-85-851-001/06A11/6.B
11. (EC-SP-11)	The safety-related Unit 1 welds associated with embedded beams identified on Civil Document Tracking Program line item No. 009489331011. Review all associated documentation, including the concrete pour records and evaluate. PROBLEM/SUBJECT: IMPROPER ENGINEERING DISPOSITION.	IN-85-442-008/09B31/9.B.3	

	Items/Groups	Associated Documents
12. (EC-SP-12)	The two Unit 1 MSRV piping restraint welds in the South Valve Room identified by QTC on drawing 48W1707-14. Evaluate using an inspection/NDE technique appropriate for the detection of cracks and laminations. NOTE: QTC response to DOE/WEP inquiry indicates that the specific welds involved are same for the referenced concerns, but the concern PH-85-027-002/08B16 implies that the problems may extend to include all MSRV piping restraints in the South Valve Room. WEP evaluation will focus on the specific welds identified and will expand the evaluation as appropriate. PH-85-027-007/08B37 is assumed to be referencing the same welds as the other concerns since it is identified as being in the same area and was initiated by the same individual. PROBLEM/SUBJECT: WELDS DO NOT MEET ACCEPTANCE CRITERIA, IMPROPER WELD REPAIR, NO INSPECTION PERFORMED.	PH-85-027-001/06A14/6.B PH-85-027-002/08A09/8.E PH-85-027-004/06A15.6.C PH-85-027-005/07A31/7.A.4 PH-85-027-006/06B23/6.B PH-85-027-007/08B37/8.A
13. (EC-SP-13)	The welds on the 4 each, 8" stainless steel ERCW pipes in the immediate area of the entry door to the Unit 1 annulus area. Evaluate using an inspection technique suitable for detection of deteriorated metal, lack of penetration and loss of purge. PROBLEM/SUBJECT: POSSIBLE SUBSURFACE DEFECTS.	WI-85-050-001/06B19/6.C
14. (EC-SP-14)	The safety-related welds associated with the "T-bar shims" on loops 3 and 4 at the 718' elevation fabricated in 1982. Evaluated using post-weld inspection/NDE. PROBLEM/SUBJECT: WELDS DO NOT MEET ACCEPTANCE CRITERIA.	IN-85-641-002/06B51/6.B
15. (QI-SP-2)	All hangers referred to in Black and Veach report with the following Numbers: 703, 709, 715, 716, 717, 718, 735, 744, 750, 751, 751, 752, 754, 795. Reinspect all hangers listed in above B&V reports. PROBLEM/SUBJECT: INCOMPLETE WELDING ON HANGER. INCOMPLETE CORRECTION ACTION.	Black and Veach report.
16. (QI-SP-3)	Perform random sample of weld operation sheets and associated NDE reports to verify that all inspectors involved are actually represented (e.g., same inspector on both documents, etc.) PROBLEM/SUBJECT: DOCUMENTATION DOES NOT NECESSARILY INDICATE THE INSPECTOR(S) WHO ACTUALLY PERFORMED THE WORK. CONFLICTING SIGNOFFS ON VARIOUS INSPECTION DOCUMENTS. INCOMPLETE TECHNICAL JUSTIFICATION ON VOID.	NCR No. 4576R, 4941.

	Items/Groups	Associated Documents
17. (QI-SP-4)	Review weld data for weld numbers listed on NCR 4582, for verification of: 1. Level and inspector for MT's on NDE report(s). 2. Level and inspector for operation sheet(s). PROBLEM/SUBJECT: NCR VOIDED STATEMENT DID NOT ADDRESS THE ACCEPTANCE SIGNATURE OF MT'S ON A OPERATION SHEET BY A LEVEL I. INCOMPLETE TECHNICAL JUSTIFICATION FOR VOIDING.	4582, 5527, 4576, 4941.
18. (QI-SP-5)	All large bore piping where windows were cut to observe welding. Evaluate to determine if windows were reinspected after repair. PROBLEM/SUBJECT: UNINSPECTED WELD WINDOW. INCOMPLETE CORRECTIVE ACTION BASED ON NO RADIOGRAPHIC EXAMINATION OF WINDOW REPAIR.	NCR 6575
19. (QI-SP-6)	1. Weld Nos.: 1-001A-D001-03A, 03B, 03C, and 03D. 1 x 1-1/2 x 6 in lg lug to subassembly 01A-M5-2. Fabrication SK: WBN-E-2878-IC-1/Hanger SK: 1-01A-303. 2. Weld Nos.: 1-001A-D003-03A, 03B, 03C, and 03D. 1 x 1-1/2 x 6 in. lg lug to DIA-M. Fabrication SK: WBN-E-2878-IC-3/Hanger SK: 1-01A-343. 3. Weld Nos.: 1-001A-D006-03A, 03B, 03C and 03D. 1 x 1-1/2 x 6 in. lg lug to DIA-MS. Fabrication SK: WBN-E-2878-IC-6/Hanger SK: 1-01A-383. 4. Weld Nos.: 1-001A-D009-03A, 03B, 03C and 03D. 1 x 1-1/2 x 6 in. lg lug to 01A-MS. Fabrication SK: WBN-E-2878-IC-9 Hanger SK: 1-01A-423. Conduct a document review to verify that the original documentation is verified as required. If verification cannot be made evaluate using an inspection technique that is appropriate. PROBLEM/SUBJECT: WELD FILLER MATERIAL CONTROL. INCOMPLETE TECHNICAL DOCUMENTATION--INSUFFICIENT WELDER STATEMENT SHEETS.	NCR 4390-Rev. 0, 1, 2
20. (QI-SP-7)	(ASME small bore) Perform required final NDE inspection on Weld 1-0038-T080-06. PROBLEM/SUBJECT: LOST DOCUMENTATION. INADEQUATE TECHNICAL VERIFICATION (BASED ON WELDER ID AND WELD ASSIGNMENT SHEET-NO VERIFICATION OF INSPECTION).	NCR 5807 R1
21. (QI-SP-8)	Structural steel partition wall (48N1322-1) anchor bolts and welds not inspected and documented. Inadequate engineering justification and inspection criteria for disposition. Reinspect to proper criteria and document results. Evaluate for impact on other like structures. PROBLEM/SUBJECT: NO INSPECTION AND DOCUMENTATION MISSING ON WELDS. INADEQUATE CORRECTION ACTION (NEED CONSIDER IMPACT--NO ORIGINAL 100% INSPECTION). INADEQUATE TECHNICAL JUSTIFICATION.	NCR 3454 R0.

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	Items/Groups	Associated Documents
22. (QI-SP-9)	Embedded HVAC frame has an unspecified number of 4 x 5 in. sections (cut-outs) re-welded back in. Cause of cut-out and integrity of weld unknown. No inspection of welds required for use-as-is disposition. Reinspect welded "cut-out" areas to approved criteria and submit to engineering for analysis of as-built condition. Location: Frame SMK16, approximately 8 ft-0 in. east of A5 and approximately 9 ft-0 in. south of "U" line. PROBLEM/SUBJECT: 4 x 5 INCH SECTIONS OF FRAMES CUT OUT, THEN WELDED BACK IN PLACE. WELDS NOT INSPECTED, ENGINEERING DISPOSITION USE-AS-IS WAS NOT JUSTIFIED.	NCR-4522 R-0.
23. (QI-SP-10)	Verify minimum wall has not been violated at the locations of arc strike removals as shown on subject CARs. PROBLEM/SUBJECT: ARC STRIKES ON UNIT 1, REACTOR COOLANT PUMPS NO. 3 AND 4 (CASINGS). NO VERIFICATION OF MINIMUM WALL THICKNESS AFTER GRINDING AND ACID ETCH. INCOMPLETE CORRECTIVE ACTION.	CAR 78-1, 78-2. NCR 1315R
24. (QI-SP-11)	Seismic pipe supports 78-1FPC-R9, R10, R-11, R-12. Examine all accessible welds using appropriate NDE/examination criteria. Submit results to engineering for appropriate analysis. Results of analysis to determine if expansion of special group is warranted. PROBLEM/SUBJECT: PIPE SUPPORTS WITH VARIOUS WELD DEFECTS. INSUFFICIENT TECHNICAL JUSTIFICATION. FOR USE-AS-IS DISPOSITION. NCR STATES USE-AS-IS DUE TO THE INSTALLATION OF SPENT FUEL RACKS CONTAINING NEW FUEL MAKING REWORK EXTREMELY DIFFICULT IF NOT IMPOSSIBLE	NCR 4139R
25. (QI-SP-12)	Evaluate welds performed by the following welders to see if they have made production welds outside of qualified range. If yes provide identification location, and proposed corrective action. Welders: M6-AA, M6-AD, M6-AE, M6-AH, 06-AU. PROBLEM/SUBJECT: 1. RANGE SPECIFIED ON WELDER QUALIFICATION INCORRECT. 2. RANGE LIMITATION NOT SHOWN IN MSL-2.9. INCOMPLETE CORRECTIVE ACTION.	CAR 85-31
26. (QI-SP-13)	Inspect the following welds on duct supports O-65-RB-H-2001 and O-65-RB-H-2002. PROBLEM/SUBJECT: NCR WAS VOIDED WITHOUT ANY EXPLANATION AS TO REASON.	NCR 3450.

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	Items/Groups	Associated Documents
27. (QI-SP-14)	Review the acceptability of ANSI B31.1 "Hot Functional" in lieu of ASME Section III hydro-test for steam generator blowdown lines. PROBLEM/SUBJECT: SUBSTITUTION OF ANSI B31.1 LEAK TEST ACTIVITY FOR THE REQUIRED ASME SECTION III HYDRO-TEST. INADEQUATE TECHNICAL JUSTIFICATION.	NCR 3782 RO, 1, 2.
28. (QI-SP-15)	Diesel Air Dryer 1A-1. Review documentation associated with this installation for weld inspection documentation or removal. If not inspected, perform and document required inspections. PROBLEM/SUBJECT: WELDING PERFORMED WITHOUT APPROVED INSTRUCTIONS. INADEQUATE CORRECTIVE ACTION BASED ON NO DETERMINATION OF IMPACT OF WELDING.	CAR 82-10
29. (QI-SP-16)	(ASME small bore) Socket welds. Visually inspect the following to verify acceptable weld size. 1-067C-T260-74 through 77 (XPS-551). 1-067C-T407-01 and 02 (XPS-858). 1-067C-T406-01 and 02 (XPS-887). PROBLEM/SUBJECT: INCORRECT SCHEDULE PIPE PER BILL OF MATERIAL. INADEQUATE CORRECTIVE ACTION (NO APPARENT VERIFICATION OF CORRECT WELD SIZE RELATED TO T). SCHEDULE 40 PIPE REPLACED BY SCHEDULE 80 WHICH WOULD REQUIRE A LARGER FILLET WELD TO BE USED.	NCR 5495-RO
30. (QI-SP-17)	(ASME small bore) Welder 6SSX was not qualified to procedure GT-88-01. 6SSX performed welds to this procedure. Review documentation for Welder 6SSX to determine if other work was performed by unqualified welders. Weld performed was done to procedures to which he was not qualified. PROBLEM/SUBJECT: TWO WELDERS WERE IDENTIFIED AS WELDING ON THE SAME JOINT. ONE WAS QUALIFIED TO DO THE WORK, THE OTHER ONE WAS NOT. INADEQUATE TECHNICAL JUSTIFICATION (NEED KNOW IF MATERIAL REQUISITION SHEET TRACES WELDER TO WELD).	NCR 4868 RO, 5304, 5330
31. (QI-SP-18)	NCR 1047 addresses 5 containment vessel penetration sleeves with conflicting weld prep thicknesses. 1. Obtain method of repair: (a) design recommendation, (b) recommended alternatives, and (c) specialized installation. 2. Obtain repair documentation. PROBLEM/SUBJECT: UNDEFINED WELD PREP REPAIR METHOD. INCOMPLETE DOCUMENTATION FOR ACCEPTABILITY OF REPAIR.	NCR 1047

	Items/Groups	Associated Documents	
32. (QI-SP-19)	All welds on seismic pipe sleeve hanger support 70-1CC-R487 (NCR 4477 RO Attachment 1). Evaluate using appropriate inspection/NDE criteria. PROBLEM/SUBJECT: INCOMPLETE TECHNICAL JUSTIFICATION FOR ACCEPTANCE OF DEFECTIVE WELDS. EVALUATE FOR IMPACT.	NCR 4477 RO	
33. (EC-SP-16)	The Unit 1 hanger at beam W33X200 located in the South Valve room at elevation 754 feet 10 inches, 1-H and 11-H on the vertical welds. Verify that this hanger has been installed per drawing requirements or suitably addressed by an NCR resolution. PROBLEM/SUBJECT: UNACCEPTABLE WELD PROFILE.	IN-85-085-001/06B05/6.B	IN-85-085-002/06B05A/6.B
34. (EC-SP-17)	The Unit 1 welds on the system 68, three inch stainless steel line on top of the pressurizer with a valve installed in the line. PROBLEM/SUBJECT: CRACK IN VALVE BODY EXTENDING INTO THE WELD ZONE.	PH-85-035-002/06B79/6.B	
35. (EC-SP-15)	The Unit 1 safety-related HVAC ductwork systems. DOE/WEP will obtain and will review TVA technical justification for the HVAC weld acceptance criteria and determine the appropriate action to evaluate these concerns. PROBLEM/SUBJECT: POSSIBLE UNINSPECTED WELDS.	PH-85-012-X03/07A29/7.A.1 IN-85-137-001/07B20/7.A.2 PH-85-012-001/07A02/7.A.1 IN-85-658-002/08B17/8.B	
36. (QI-SP-1)	Arc strike on pressurizer relief tank spin WAT-RCATPR-01. Visually inspect to determine that minimum wall thickness was not violated. determiine the appropriate action to evaluate these concerns. PROBLEM/SUBJECT: ARC STRIKE. INCOMPLETE CORRECTIVE ACTION. NO CHECK FOR MINIMUM WALL THICKNESS.	NCR717R1	

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Items/Groups	Associated Documents
201. (EC-SPL-1) Welds performed using the Shielded Metal Arc Process (SMAW). (A) DOE/WEP will evaluate the effects of welding with coated electrode that has been exposed to atmosphere for prolonged periods of time and determine the appropriate method to physically examine the subject welds. (B) DOE/WEP will evaluate the potential for inadvertent use of incorrect weld filler. NOTE: (1) Preliminary WEP review indicates that steels with carbon equivalents less than 0.45 are not detrimentally affected by prolonged flux exposure. (2) The only specific reference to the possibility of mixing rod due to filler material control practice appears as the result of the investigation of concern IN-85-052-008 which indicates that 7018/E309 from rod shack No. 2 had only one operating oven which could "easily mix rods at issue." PROBLEM/SUBJECT: IMPROPER PROCEDURES FOR CONTROL OF COATED ELECTRODE.	IN-85-001-002/03A01/3.A IN-85-768-X06/03A20/3.A IN-85-310-005/03B02/3.A WI-85-041-009/03A21/3.A EX-85-061-003/03A25/3.A IN-86-047-001/03B08/3.A EX-85-021-001/03A16/3.A IN-85-052-008/03A02/3.A IN-85-424-007/03A13/3.A IN-85-441-003/03A18/3.A IN-85-725-011/03A24/3.A WI-85-002-001/03B23/3.A IN-86-039-001/03B45/3.A IN-86-305-004/03A23/3.A IN-85-947-005/03B41/3.A WI-85-053-004/03B21/3.A IN-85-454-004/03A08/3.A IN-85-453-009/03A15/3.A IN-85-426-001/03A10/3.A IN-85-352-002/03A06/3.A IN-85-337-002/03A04/3.A IN-85-424-001/03A11/3.A IN-85-234-001/03A05/3.A EX-85-039-001/03A26/3.A DER WEP 501
202. (EC-SPL-4) All Unit 1 safety-related electrical supports in the auxiliary building, 713' elevation, fabricated between 1980-1981. Review NCRs for evidence of suitable resolution by TVA. If there is no evidence of resolution, evaluate using standard post-weld inspection/NDE. NOTE: Establish the group by area only if segregation by date is not possible. PROBLEM/SUBJECT: WELDER NOT QUALIFIED TO PROCEDURE USED. (UNQUALIFIED APPRENTICES)	IN-85-055-003/01B20/1.A.4
203. (EC-SPL-6) All safety-related, Unit 1 fire protection system welds in the Diesel Generator Building No. 5. Evaluate using an inspection/NDE technique appropriate to detect lack of bevel prior to welding. PROBLEM/SUBJECT: WELDS DO NOT MEET ACCEPTANCE CRITERIA.	WI-85-064-005/06B31/6.B

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	Items/Groups	Associated Documents
204. (EC-SPL-7)	All safety-related, Unit 1 heavy wall intake piping between the pump house and reactor. DOE/WEP will identify the system involved, review NCRs for evidence of suitable resolution by TVA, and review the associated weld procedures to verify that the use of 6010-P5 was not permitted by the procedure. Further assessment will be based on this data assessment. NOTE: (1) Preliminary WEP review indicates there is no 32" piping from the pumphouse. There is a 30" and a 36" essential raw water line that may have been what the CI is referring to. PROBLEM/SUBJECT: WELD PROCEDURE NOT FOLLOWED.	PH-85-035-003/08B27/8.A
205. (EC-SPL-8)	All AWS welds fabricated prior to November 2, 1981 and inspected when inspection through carbo-zinc primer was authorized. DOE/WEP will evaluate TVA's technical justification for authorization of inspection through carbo-zinc primer, the reason for rescinding the authorization, and TVA's action to assure acceptability of welds accepted by this technique. If the technical justification and assessment of the affects on weld quality by TVA are inadequate, the subject weld group will be physically evaluated using standard post-weld inspection with all coatings removed. NOTE: Preliminary WEP review indicates that the period that inspection was authorized is 12/01/81 to 01/23/84, and was authorized as a reexamination effort. PROBLEM/SUBJECT: INSPECTION THROUGH PAINT, MISSING DOCUMENTATION.	WI-85-030-008/07B01/7.A.3 WI-85-030-009/07B02/7.A.3 IN-85-458-001/07A18/7.A.3 IN-86-019-001/07B14/7.A.3 PH-85-040-001/07A20/7.A.3 WI-85-041-010/07B16/7.A.3 WI-85-041-008/07A21/7.A.3 WI-85-041-007/07B56/7.A.3 NS-85-001-001/07A22/7.A.3 WI-85-030-007/07B19/7.A.3 WI-85-013-003/07A14/7.A.3 WI-85-041-006/07A25/7.A.3 IN-85-767-003/07A19/7.A.3 WI-85-041-004/05B08/5.C.1 IN-85-476-003/07A24/7.A.4
206. (EC-SPL-9)	All Unit 1 safety-related PDO devices located in the reactor building. Evaluate using standard post-weld inspection/NDE. NOTE: Preliminary WEP review indicates that material (except crushable (Ref. Drawing 48W1700-01,RS, Note 1) honeycomb cushions and sleeves used as compressable components and penetrations) fabrication and welding was by TVA. PROBLEM/SUBJECT: UNSATIFACTORY WELD APPEARANCE.	IN-86-301-001/06B25/6.D

Items/Groups	Associated Documents	
207. (EC-SPL-10) All safety-related Unit 1 steam generator supports. DOE/WEP will review the associated weld procedures to verify what preheat and post-weld heat treatment requirements were invoked. If preheat is required without evidence of post-weld heat treatment evaluate using an inspection/NDE technique appropriate to detect the effects of improper preheat. PROBLEM/SUBJECT: WELD PROCEDURE NOT FOLLOWED.	IN-85-641-005/08B21/8.A WI-85-081-003/08B44/8.A	WI-85-064-002/08B45/8.A
208. (EC-SPL-11) All safety-related, Unit 1 welds associated with instrument panel drain thread-o-lets to drain headers for systems 62, 63, and 68. Evaluate the documentation and certification requirements and examine the weld documentation associated with these welds. If these welds are improperly documented they will be physically evaluated using standard post-weld inspection/NDE. NOTE: DOE/WEP has determined that the drains for systems 62, 63, and 68 are located in seismic buildings and are therefore TVA Class G safety-related (ref. drawing 47W600-0-4, R21, note 18). PROBLEM/SUBJECT: WELD PROCEDURE INADEQUATE.	IN-85-143-001/08B42/8.B	IN-85-143-002/08B42A/8.B
209. (EC-SPL-12) All Unit 1, safety-related pressure boundary welds requiring post-weld heat treat using the PWHT log. Evaluate by selecting a sample of welds using the post-weld heat treat log, verifying that the temporary welds are properly documented and that they have been physically removed. NOTE: (1) If there is a listing of voided WOS's, use this list to establish special group. (2) If TVA follow-up to this concern has properly addressed the problem associated with voided weld documentation for temporary welds, this special group will be voided. PROBLEM/SUBJECT: UNDOCUMENTED TEMPORARY WELDS AND REMOVAL.	WI-85-053-003/05A05/5.B.1	
210. (EC-SPL-13) All safety-related Unit 1 welds made by welders 01A22, 01B13, 01A31-1 through 01A31-7. Evaluate using standard post-weld inspection/NDE and/or documentation review as indicated by engineering evaluation. PROBLEM/SUBJECT: BACKDATING WELDER CERTIFICATION.	IN-85-965-001/01A22/1.A.1 IN-85-770-X07/01A31/1.A.1 IN-85-965-002/01B13/1.A.1	IN-85-770-002/01A21/1.A.1 IN-85-770-003/01A16/1.A.1 IN-85-089-003/01B50/1.A.4

	Items/Groups	Associated Documents
211. (EC-SPL-14)	All Unit 1 safety-related main steam piping welds. DOE/WEP will identify all welders associated with safety-related main steam welds and evaluate those qualifications made by plate test. If the qualifications were made in the flat (1G) position, evaluate all welds made by improperly certified welders using standard post-weld inspection/NDE. NOTE: (1) This group will be moved to the specific section if warranted by small group size. (2) At WEP request for more information QTC follow-up with the CI revealed that the concern was based on hearsay. The informant identified by the CI stated that he does not know anything about flat plate testing positions. PROBLEM/SUBJECT: QUESTIONABLE WELDER TRAINING/EXPERIENCE.	IN-86-190-002/01B33/1.B
212. (EC-SPL-15)	All open butt, no backing ring, radiographed, first piping welds off penetraters of containment wall. Evaluate the pipe wall thickness using an appropriate inspection/NDE technique. PROBLEM/SUBJECT: POSSIBLE MINIMUM WALL VIOLATION.	IN-85-579-005/07B51/7.B.1
213. (EC-SPL-16)	Unit 1, safety-related welds associated with the refueling pit liner. Evaluate using standard post-weld inspection/NDE. NOTE: (1) Preliminary WEP review indicates that the subject welds were fabricated by TVA and are safety-related. (2) QTC response to DOE/WEP request to provide specific weld locations indicates that problem should be considered generically. QTC also said the refueling pit liner was the area of concern. PROBLEM/SUBJECT: WELDS DO NOT MEET ACCEPTANCE CRITERIA.	WI-85-081-004/06B50/6.B
214. (EC-SPL-17)	All safety-related Unit 1 structural steel members located in the North and South Valve Room. Evaluate using an inspection/NDE technique appropriate for the detection of problems associated with improper preheat and/or subsurface cracking. PROBLEM/SUBJECT: POSSIBLE SUBSURFACE DEFECTS, WELD PROCEDURE NOT FOLLOWED.	IN-86-032-002/06A16/6.C IN-85-671-003/08B24/8.A

	Items/Groups	Associated Documents
215. (EC-SPL-18)	All Unit 1 safety-related welds requiring interpass temperature control. DOE/WEP will evaluate the problem of interpass temperature control in relation to the specific plant operating parameters and make recommendations to TVA as appropriate. NOTE: (1) Preliminary WEP review indicates that the objectionable physical problem with failure to control interpass temperatures is sensitization of grade P8 stainless steel in the heat affected zone leading to increased susceptibility to stress corrosion cracking, inservice. (2) DOE/WEP requested QTC to indicate whether or not the CI knows or believes that interpass temperatures were actually exceeded and if so, to provide specific systems, welds and time frames. QTC response indicates that the CI cannot provide any information identifying welds or systems and does not recall if interpass temperatures were actually exceeded. PROBLEM/SUBJECT: WELD PROCEDURE NOT FOLLOWED FOR INTERPASS TEMPERATURE MONITORING.	IN-85-185-001/08B47/8.A NRC enforcement item IN-85-834-002/08B15/8.A 390/78-31
216. (EC-SPL-19)	All Unit 1 safety-related welds in instrument lines and heat exchanger piping located in the reactor building, South Fan Room. Evaluate using standard post-weld inspection/NDE with a review of the associated documentation. PROBLEM/SUBJECT: WELDERS RECERTIFIED IN A QUESTIONABLE MANNER.	EX-85-021-002/01A09/1.A.2
217. (QI-SPL-1)	PDO's installed prior to Jan. 1981 were first accepted and later found unacceptable. Inspector qualification is questionable. Did not address all protective devices. Only pipe rupture protection sleeves. Sample inspect balance of protection devices (except pipe rupture protection sleeves). PROBLEM/SUBJECT: INCOMPLETE CORRECTIVE ACTION.	NCR 3523 R0, 3001 R3, 3325 R1
218. (QI-SPL-2)	NRC overview item 390/78-31. Verify welders are checking interpass temperatures. PROBLEM/SUBJECT: WELDERS WERE GIVEN A TRAINING SESSION BUT THE IMPACT ON PRIOR WORK PERFORMED WAS NOT ADDRESSED. INCOMPLETE CORRECTIVE ACTION (IMPACT).	Fold into Special Group 215 NRC Report 78-31-02.
219. (QI-SPL-3)	Reinspect welds in control building on safety related duct supports (Ref NCR 2819). PROBLEM/SUBJECT: SAFETY RELATED HVAC DUCT SUPPORTS IN THE CONTROL BUILDING HAVE DEFICIENT WELDS AS STATED ON NCR 2819. (THIS NCR WAS VOIDED AND THE CONDITION TO BE INCORPORATED ONTO NCR 2576. NOTE: NCR 2576 CONCERNS BOLT HOLES IN BASE-PLATES). INCOMPLETE CORRECTIVE ACTION. NCR 2819 ADDRESSED 66 DUCT SUPPORTS.	NCR 2819, 2576.

	Items/Groups	Associated Documents
220. (QI-SPL-4)	Evaluate using an appropriate inspection/NDE method for determination of root quality resulting from failure to purge prior to welding. PROBLEM/SUBJECT: INCOMPLETE CORRECTIVE ACTION. PURGE NOT VERIFIED DURING WELDING. PT DONE AFTER ANI SIGNOFF NOT ADDRESSED. NCR 5493 INADEQUATE TECHNICAL JUSTIFICATION (ALSO 5385). N/A IN PURGE VERIFICATION BLOCK ON WOS SHEET.	NCR 5211, 5093, 5493, 5385, 5389, 5164.
221. (QI-SPL-5)	Evaluate adequacy of the sample plan used for NCR 2375R. PROBLEM/SUBJECT: SAMPLE SIZE WAS REDUCED FROM 106 DRAWINGS TO 57 WITHOUT STATISTICAL VALIDATION TO WARRANT THE REDUCTION. INCOMPLETE TECHNICAL JUSTIFICATION.	NCR 2375R.
222. (QI-SPL-6)	Platforms, ladders, and stairs in Cat. 1 structures erected and documented prior to Jan. 1, 1981. Sample above items fabricated, installed, and inspected prior to Jan. 1, 1981. PROBLEM/SUBJECT: FAILURE TO CONSTRUCT AND INSPECT PER DESIGN. INADEQUATE TECHNICAL JUSTIFICATION. (3579 NOT CLOSED).	NCR 3579 R0, 8/24/81.
223. (QI-SPL-7)	Inspector transferred from another site to Watts Bar Plant. His prior L-II certification was revoked and he was not immediately recertified upon starting inspections at WBNP. All hangers inspected while uncertified were reinspected but results of this reinspection is indeterminate. Review documentation to determine status. PROBLEM/SUBJECT: INCOMPLETE TECHNICAL JUSTIFICATION.	NCR 4374 R0.
224. (QI-SPL-8)	All PBW's (lugs). Evaluate using an appropriate inspection/NDE method. PROBLEM/SUBJECT: HANGER LUG WELDS FAIL TO COMPLY WITH FINAL VISUAL ACCEPTANCE CRITERIA. INCOMPLETE CORRECTIVE ACTION BASED ON NO ASSESSMENT OF IMPACT (TREND). (3632R)	NCR 4625, 4759, 4574R, 5962R, 5492R, 3745R, 5559R, 5177R1, 4985R, 4483R, 4507R, 5435R, 5946R, 2064R, 2065R, 3776R1, 5308R, 3632R, 2451, 2882, 3257, 3632, 4301.
225. (QI-SPL-9)	Reinspect all conduit supports on elevation 708 control building per 47A056 and 47A050 series drawings. 1. Verify associated documentation is in vault as noted on NCR. 2. If documentation is not available and satisfactory, implement reinspection. PROBLEM/SUBJECT: WELDING DOES NOT MEET INSPECTION CRITERIA. INCOMPLETE CORRECTIVE ACTION-NO IMPACT ASSESSMENT-NOT CLEAR THAT REINSPECTION/REWORK WAS ACCOMPLISHED.	NCR 2629.

ORIGINAL

	Items/Groups	Associated Documents
226. (QI-SPL-10)	All pipe welding. Perform engineering evaluation to assess use of alignment beads. PROBLEM/SUBJECT: UNAUTHORIZED AND UNDOCUMENTATED ALIGNMENT BEAD WELDS. INCOMPLETE CORRECTION ACTION. NO ASSESSMENT OF IMPACT.	Enforcement Item #390/79-25-01.
227. (QI-SPL-11)	Stiffener and crossbracing welds on surge line truss, Drawing 48W1703-06R2, -05R5, 07R3, and 08R2. Disposition not adequate. Reinspect all stiffener and crossbracing welds to current drawing criteria. PROBLEM/SUBJECT: IMPROPER FIT-UP AND QC ACCEPTANCE. INCOMPLETE CORRECTIVE ACTION. ASSESS OTHER AREAS OF PLANT FOR SIMILAR PROBLEM. (IMPACT, TREND).	NCR-3302 REV0.
228. (EC-SPL-20)	Unit 1 safety-related welds attaching check valves into the six inch fire protection system piping. Evaluate using standard post-weld inspection/NDE to detect incomplete welds. PROBLEM/SUBJECT: INCOMPLETE WELDS.	EX-85-020-001/06B78/6.B
229. (EC-SPL-21)	Unit 1 safety-related welds (TVA welded) on steam generator supports. Examine using an inspection/NDE technique appropriate to detect subsurface defects. PROBLEM/SUBJECT: SUBSURFACE SLAG INCLUSIONS.	IN-86-184-001/06B80/6.C IN-86-184-003/07B25/7.A.2
230. (QI-SPL-12)	All welds on seismic pipe sleeve hanger supports in which the configuration is similar to that shown on Drawing 70-1Cc-R487. Evaluate using appropriate inspection/NDE criteria. PROBLEM/SUBJECT: LACK OF WELD, SLAG INCLUSION, LACK OF FUSION, UNDERCUT, WELD SPATTER.	NCR 4477R
231. (EC-SPL-22)	All Unit 1, safety-related box anchors. Evaluate using an inspection/NDE technique appropriate to detect weld run-in at the end plate seam welds and thermal stress resulting from excessive weld size at the end plate to pipe attachment weld. PROBLEM/SUBJECT: WELD RUN-IN, RESIDUAL THERMAL STRESS.	IN-85-634-002/08B32/8.B EX-85-039-003/09A02/9.A.1 IN-85-613-001/09B13/9.A.1 IN-85-634-001/09B14/9.A.1 IN-85-316-005/09B38/9.A.1 IN-85-405-001/09B16/9.A.1 WBP-6-007-001/09B35/9.A.1 OW-85-003-001/09B36/9.A.1 IN-85-672-001/09B15/9.A.1
232. (EC-SPL-23)	All Unit 1, safety-related pipe support welds. Evaluate using standard post-weld inspection/NDE and review associated documentation. PROBLEM/SUBJECT: INADEQUATE INSPECTOR/CRAFT TRAINING, QUESTIONABLE WELD QUALITY AND INSPECTION PRACTICE, AND CONFLICTING PROCEDURES/DRAWINGS.	IN-85-247-002/08B01/8.C IN-85-532-006/07A04/7.A.2 IN-85-682-002/07B59/7.A.2 EX-85-037-002/01B45/1.A.4 IN-85-707-003/01B08/1.B WI-85-041-002/02A15/2.A

Items/Groups		Associated Documents	
233. (EC-SPL-24)	All Unit 1, safety-related piping welds. Evaluate using standard post-weld inspection/NDE and review associated documentation. PROBLEM/SUBJECT: QUESTIONABLE WELD DOCUMENTATION, QUESTIONABLE WELDING PARAMETERS USED, QUESTIONABLE WELDER QUALIFICATION AND EQUIPMENT SUITABILITY, QUESTIONABLE BASE MATERIAL, AND QUESTIONABLE WELD QUALITY.	IN-85-469-003/08B33/8.B IN-85-247-002/08B01/8.C IN-85-298-002/08B06/8.C IN-85-280-001/08B07/8.C IN-85-982-003/08B35/8.D IN-86-184-004/08A04/8.D IN-86-249-X02/08A07/8.D WI-85-035-007/01A57/1.A.4 EX-85-048-004/01B27/1.A.4 IN-85-923-002/01B42/1.A.4 IN-85-282-002/07A05/7.B.1 IN-85-947-X08/01B12/1.B IN-85-260-X05/05A23/5.B.2 IN-85-406-001/05A01/5.A.1 EX-85-003-003/05A08/5.A.1 IN-85-445-002/05A02/5.A.1 IN-85-445-X16/05A02A/5.A.1 HI-85-040-001/05A03/5.A.1 IN-85-627-036/01A49/1.A.1 IN-85-627-037/01A53/1.A.1 IN-85-458-007/05A04/5.A.1 IN-85-460-003/04A02/4.A IN-86-046-003/08B23/8.B IN-86-184-002/08A05/8.D EX-85-003-X04/05B47/5.A.1	IN-85-556-001/01A37/1.A.4 IN-85-260-002/05A22/5.B.2 WI-85-035-002/05B21/5.B.2 IN-85-260-001/05A21/5.B.2 WI-85-081-002/05B35/5.B.3 WI-85-064-001/05B27/5.B.3 IN-85-435-003/09B27/9.B.4 IN-86-085-003/09B09/9.C.1 WI-85-030-006/09B18/9.B.1 IN-85-310-004/07B39/7.A.2 IN-85-155-001/06B02/6.D EX-85-037-003/06B29/6.D IN-85-845-004/06A04/6.E IN-85-632-001/06B10/6.C IN-85-303-001/08B04/8.C IN-85-576-001/05A12/5.A.1 IN-85-890-001/05A10/5.A.1 WI-85-064-006/05B13/5.A.1 WI-85-025-001/05A14/5.A.1 IN-85-446-001/05A11/5.A.1 EX-85-003-X06/05A13/5.A.1 IN-85-579-001/06A07/6.A IN-85-349-005/06B32/6.A WI-85-081-005/06B64/6.B
234. (EC-SPL-25)	All Unit 1, safety-related civil welds. Evaluate using standard post-weld inpsection/NDE and associated documentation. PROBLEM/SUBJECT: POOR WORKMANSHIP AND WELD QUALITY, IMPROPER REPAIR AND WELDING PRACTICES, AND CRAFT RESPONSIBLE FOR FITUP AND MATERIAL.	IN-86-184-003/07B25/7.A.2 WI-85-035-001/07B23/7.B.2	IN-85-026-001/07A13/7.B.2 IN-85-297-004/01B67/1.A.4 WBM-5-001-001/07B63/7.B.2
235. (EC-SPL-26)	All Unit 1, safety-related electrical supports. Evaluate using standard post-weld inspection/NDE and review associated documentation. PROBLEM/SUBJECT: QUESTIONABLE WELDER QUALIFICATION AND QUESTIONABLE INSPECTOR TRAINING.	IN-85-225-001/01B02/1.B	IN-85-706-002/02A05/2.B
236. (EC-SPL-27)	Unit 1, safety-related structural welds. Evaluate using standard post-weld inspection/NDE and review associated documentation review. PROBLEM/SUBJECT: AISC/AWS WELD REQUIREMENTS NOT MET, NO DOCUMENTATION FOR SURVEILLANCE PROGRAM., INSPECTION OF FITUP BY QC DELETED, AND NO WELD INSPECTION TOOLS PRIOR TO 1979.	IN-85-109-003/07B37/7.A.2 IN-85-682-002/07B59/7.A.2 WI-85-030-007/07B19/7.B.2 IN-85-488-001/07B46/7.B.2 IN-85-584-001/07A09/7.B.2 IN-85-050-001/08B40/8.C IN-85-887-003/05B26/5.C.1	IN-85-406-003/07B04/7.B.3 WI-85-041-013/07B58/7.B.2 WI-85-013-002/07B54/7.B.2 IN-85-671-001/07A11/7.B.2 IN-85-052-007/07A12/7.B.2 IN-85-052-006/07A10/7.B.2

	Items/Groups	Associated Documents
237. (QI-SPL-13)	All skewed fillet welds on seismic supports. Evaluate using appropriate weld inspection/NDE criteria. PROBLEM/SUBJECT: INSPECTOR CERTS/QUAL. INCOMPLETE TECHNICAL JUSTIFICATION.	NCR 2807.
238. (QI-SPL-14)	All welds inspected with the PT method prior to 1980. PROBLEM/SUBJECT: LACK OF KNOWLEDGE OF THE ACCEPTANCE CRITERIA. INCOMPLETE TECHNICAL JUSTIFICATION.	NRC enforcement item 390/79-25-01 and 390/80-19-01.
239. (QI-SPL-15)	Sample the population of welds requiring NDE examination and compare acceptability with existing NDE reports for each weld examined. Bounded by time period 1/77 thru 12/78 and personnel identified by WEP. PROBLEM/SUBJECT: NDE DOCUMENTATION VALIDITY.	NSRS Rep. #I-83-01-WBN.
240. (QI-SPL-16)	All welds performed requiring inert purge gas. Evaluate using appropriate inspection technique. PROBLEM/SUBJECT: WELDING WITHOUT PURGE. INCOMPLETE TECHNICAL JUSTIFICATION NEED ADDITIONAL INFORMATION.	NRC Enforcement Item #390/79-41. NRC Enforcement Item #390/78-3.
241. (QI-SPL-17)	Structural steel in main steam valve room on dwgs. A8001707 and 48W1708 had unacceptable welds. Welds previously accepted and later found unacceptable. No assessment made to determine extent of this condition in other areas. Evaluate through inspection sample of general structural groups. PROBLEM/SUBJECT: INSPECTOR'S QUALIFICATION. INADEQUATE CORRECTIVE ACTION (BASED ON SEVERAL MAJOR NCRS IN VALVE ROOM, NO CONFIDENCE IN REMAINING PLANT BEING UNAFFECTED).	NCR 4753 Rev. 1, 3718 R1, 5561
242. (QI-SPL-18)	Inspectors missing inspections and lack of inspector's awareness of acceptance criteria resulted in acceptance of deficient welds. Sample general population to assess extent of impact. PROBLEM/SUBJECT: TREND.	NCR 2528 R0, 2529 R0, 5305 R0, 4201 R0, 4737 R0, 4909 R0, 4667 R0, 3216 R, 3443 R, 5143 Rev 0, 5246 Rev 0, 5635 Rev 0, 5604 Rev 0, 6274 Rev 0.

	Items/Groups	Associated Documents
243. (QI-SPL-19)	Review and analyze a potential generic problem. All structural and miscellaneous features may not have been reviewed for field configuration versus applicable drawings. PROBLEM/SUBJECT: REPORT STATES "ALL STRUCTURAL AND MISCELLANEOUS FEATURES COULD POSSIBLY HAVE SIMILAR DEFECTS" NOT CONFORMING TO THE DRAWINGS. REPORT DEALS WITH PLATFORM, STAIRS, AND LADDERS MAINLY WITH CONNECTION DETAILS AND WELDS WHICH ARE DIFFERENT FROM THE ORIGINAL DESIGN. INCOMPLETE CORRECTIVE ACTION.	50.55(e). WBRD-50-390/81-75. NCRs 2375R.
244. (QI-SPL-20)	Review documentation for quality conformance, authenticity, and adequacy for the welds associated with the listed NCRs. PROBLEM/SUBJECT: INSUFFICIENT, LOST, INCOMPLETE DOCUMENTATION TREND-DOCUMENTATION PROBLEM.	NCR's 2013, 2134, 2191, 2196, 2344, 2999R1, 3101, 3104, 3133, 3134, 3139, 3179, 3244, 3377, 3385, 3456, 3468, 3548, 3593, 3613, 3621, 3645, 3654, 3732R1, 5384R2, 5452, 5459R1, 5580, 5613, 5788, 5808.
245. (QI-SPL-21)	Review adequacy of the ANSI lugs for inspection, installation, training and documentation. PROBLEM/SUBJECT: ANSI LUGS INSTALLED INCORRECTLY INSPECTIONS PERFORMED INCORRECTLY AND THE SAME PROBLEMS REOCCURRED AFTER RETRAINING OF RESPONSIBLE CRAFT AND ENGINEERING PERSONNEL. INCOMPLETE TECHNICAL JUSTIFICATION.	NCR's 2451.
246. (EC-SPL-2)	All safety-related Unit 1 electrical supports fabricated prior to February 13, 1981. Evaluate using standard post-weld inspection/NDE with a review of supporting documentation. PROBLEM/SUBJECT: POSSIBLE INCORRECTLY APPLIED ACCEPTANCE CRITERIA.	IN-85-887-001/05A20/5.C.1 WI-85-041-003/05A19/5.C.1 EX-85-076-001/06B43/6.B IN-86-019-003/06B24/6.D WI-85-030-004/09A14/9.B.3
247. (EC-SPL-3)	All Unit 1 safety-related civil structures and miscellaneous steel installed prior to February 13, 1981. Evaluate using standard post-weld inspection/NDE. review of supporting documentation. PROBLEM/SUBJECT: SAMPLING INSPECTION PROGRAM IMPROPERLY APPLIED.	WI-85-013-001/02A26/2.A IN-85-868-002/06B68/6.D PH-85-032-001/06B67/6.D
248. (EC-SPL-5)	All instrument supports installed prior to February 13, 1981 and not already identified as nonconforming under NCR W-334-P Rev. 0 and evaluate using standard post-weld inspection/NDE with a review of the associated weld inspection documentation. PROBLEM/SUBJECT: WELD NOT PROPERLY ACCEPTED BY ENDES EVALUATION.	WI-85-029-002/07A17/7.A.4

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	Items/Groups	Associated Documents
249. (EX-SPL-1)	All safety related Unit 1 radiographed welds that the radiographic film was interpreted by the subject interpreter. Re-read to assure the absence of defects. PROBLEM/SUBJECT: ACCEPTED RADIOGRAPHS WITH DEFECTS IN EXCESS OF CODE REQUIREMENTS/GENERAL GROUP B.	N/A
250. (EX-SPL-2)	Unit 1 safety-related clips on cable trays in the auxiliary building 713 elevation, fabricated between 1980-1981 and Unit 1 safety-related clips on trays fabricated and installed before February 13, 1981. Evaluate for acceptable weld profile. (This group is formed based on causal analysis of examination data from groups 202 and J). PROBLEM/SUBJECT: WELD PROFILE	N/A
251. (EX-SPL-3)	Unit 1 safety-related electrical supports in the auxiliary building 713 elevation, fabricated between 1980-1981. Conduit supports on elevation 708 in the control building and installed before February 13, 1981. Cable tray clips shall be excluded from this group because they are being evaluated in group 250. Evaluate for weld size, profile, length and location. (This group is formed based on causal analysis of examination data from groups 202,225 and J). PROBLEM/SUBJECT: WELD PROFILE, WELD LENGTH, WELD SIZE, AND WELD LOCATION	N/A 1 ORR WEP 501
252. (EX-SPL-4)	All Unit 1 safety-related mechanical equipment and related supports made by TVA. Evaluate using standard post-weld inspection/NDE with a review of supporting documentation. PROBLEM/SUBJECT: THIS GROUP IS FORMED BECAUSE THE SUBJECT WELD POPULATION IS NOT CURRENTLY INCLUDED WITHIN THE WEP GENERAL GROUPS FORMULATED TO ADDRESS THE OVERALL WBNP WELD POPULATION.	N/A

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	Items/Groups	Associated Documents
A.	ASME Section III, Class 1, 2, and 3 small bore piping, (2 inch nominal diameter and less), TVA Class A, B, C, and D. Evaluate using standard post-weld inspection/NDE.	N/A
B.	ASME Section III, Class 1, 2, and 3 large bore piping, (2 inch nominal diameter and larger), TVA Class A, B, C, and D. Evaluate using standard post-weld inspection/NDE.	N/A
C.	ANSI B31.1, Power Piping, TVA Classes G, H, M and N and ANSI B31.5, Refrigeration Piping, TVA Classes M and N. Evaluate using standard post-weld inspection/NDE.	N/A
D.	All safety-related Civil welds made subsequent to February 13 1981 including, but not limited to structural steel, ladders, walkways, doors, door frames, protective devices (PDOs), platforms, and imbeds. Evaluate using standard post-weld inspection/NDE.	N/A
E.	All safety-related Civil welds made prior to February 13, 1981, including, but not limited to structural steel, ladders, walkways, doors, door frames, protective devices (PDOs), platforms, and imbeds. Evaluate using standard post-weld inspection/NDE.	N/A
F.	All safety-related pipe support welds. Evaluate using standard post-weld inspection/NDE.	N/A
G.	All safety-related instrument supports, including, but not limited to, instrument panel board mounting, fabricated and installed subsequent to February 13, 1981. Evaluate using standard post-weld inspection/NDE.	N/A
H.	All safety-related instrument supports, including, but not limited to, instrument panel board mounting, fabricated and installed prior to February 13, 1981. Evaluate using standard post-weld inspection/NDE.	N/A
I.	All safety-related electrical supports, including, but not limited to, MCC monitoring, switchgear mounting, electrical equipment mounting, cable tray supports and conduit supports, fabricated and installed subsequent to February 13, 1981. Evaluate using standard post-weld inspection/NDE.	N/A
J.	All safety-related electrical supports, including, but not limited to, MCC monitoring, switchgear mounting, electrical equipment mounting cable tray supports and conduit supports, fabricated and installed prior to February 13, 1981. Evaluate using standard post-weld inspection/NDE.	N/A
K.	All safety-related duct supports, including HVAC equipment supports, fabricated and installed subsequent to February 13, 1981. Evaluate using standard post-weld inspection/NDE.	N/A
L.	All safety-related duct supports, including HVAC equipment supports, fabricated and installed prior to February 13, 1981. Evaluate using standard post-weld inspection/NDE.	N/A
M.	All safety-related HVAC ductwork systems. DOE/WEP will evaluate TVA technical justifications for HVAC weld acceptance criteria and/or methods and determine the appropriate action to assess systems acceptability.	N/A

Group Number and/or Origin	Method of Investigation/Verification			
	Document Review	Engineering Evaluation	Document Review/ Examination	Examination
1. (EC-SP-1)	X	--	--	--
2. (EC-SP-2)	--	--	--	X
3. (EC-SP-3)	--	--	--	X
4. (EC-SP-4)	--	--	--	X
5. (EC-SP-5)	X	--	--	--
6. (EC-SP-6)	--	--	--	X
7. (EC-SP-7)	X	--	--	--
8. (EC-SP-8)	--	--	--	X
9. (EC-SP-9)	--	--	X	--
10. (EC-SP-10)	--	--	--	X
11. (EC-SP-11)	X	--	--	--
12. (EC-SP-12)	--	--	--	X
13. (EC-SP-13)	--	--	--	X
14. (EC-SP-14)	--	--	--	X
15. (QI-SP-2)	--	--	X	--
16. (QI-SP-3)	X	--	--	--
17. (QI-SP-4)	X	--	--	--
18. (QI-SP-5)	--	--	--	X
19. (QI-SP-6)	--	--	X	--
20. (QI-SP-7)	--	--	X	--
21. (QI-SP-8)	--	--	--	X
22. (QI-SP-9)	--	--	--	X
23. (QI-SP-10)	X	--	--	--
24. (QI-SP-11)	--	--	--	X

Group Number and/or Origin	Method of Investigation/Verification			
	Document Review	Engineering Evaluation	Document Review/ Examination	Examination
25. (QI-SP-12)	X	--	--	--
26. (QI-SP-13)	--	--	--	X
27. (QI-SP-14)	X	--	--	--
28. (QI-SP-15)	X	--	--	--
29. (QI-SP-16)	X	--	--	--
30. (QI-SP-17)	X	--	--	--
31. (QI-SP-18)	X	--	--	--
32. (QI-SP-19)	--	--	--	X
33. (EC-SP-16)	X	--	--	--
34. (EC-SP-17)	--	--	--	X
35. (EC-SP-15) (General Group "M")	--	--	--	X
36. (QI-SP-1)	X	--	--	--
201. (EC-SPL-1)	--	X	--	--
202. (EC-SPL-4)	--	--	X	--
203. (EC-SPL-6)	--	--	--	X
204. (EC-SPL-7)	--	X	--	--
205. (EC-SPL-8)	--	--	--	X
206. (EC-SPL-9) (Combined with No. 217)	X	--	--	--
207. (EC-SPL-10)	--	--	--	X
208. (EC-SPL-11)	--	--	--	X
209. (EC-SPL-12)	--	--	--	X
210. (EC-SPL-13)	--	--	--	X
211. (EC-SPL-14)	X	--	--	--
212. (EC-SPL-15)	--	--	--	X

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Group Number and/or Origin		Method of Investigation/Verification			
		Document Review	Engineering Evaluation	Document Review/ Examination	Examination
213. (EC-SPL-16)		--	X	--	--
214. (EC-SPL-17)		--	--	--	X
215. (EC-SPL-18)	(Combined with No. 218)	--	X	--	--
216. (EC-SPL-19)		--	--	--	X
217. (QI-SPL-1)	(Combined with No. 206)	X	--	--	--
218. (QI-SPL-2)	(Combined with No. 215)	--	X	--	--
219. (QI-SPL-3)		--	--	--	X
220. (QI-SPL-4)		--	--	--	X
221. (QI-SPL-5)		X	--	--	--
222. (QI-SPL-6)		--	--	--	X
223. (QI-SPL-7)		X	--	--	--
224. (QI-SPL-8)		--	--	--	X
225. (QI-SPL-9)		--	--	X	--
226. (QI-SPL-10)		--	X	--	--
227. (QI-SPL-11)		--	--	--	X
228. (EC-SPL-20)		--	--	--	X
229. (EC-SPL-21)		--	--	--	X
230. (QI-SPL-12)		--	--	--	X
231. (EC-SPL-22)		--	X	--	--
232. (EC-SPL-23)		--	--	--	X
233. (EC-SPL-24)		--	--	--	X
234. (EC-SPL-25)		--	--	--	X
235. (EC-SPL-26)		--	--	--	X
236. (EC-SPL-27)		--	--	--	X
237. (QI-SPL-13)		--	--	--	X

Group Number and/or Origin	Method of Investigation/Verification			
	Document Review	Engineering Evaluation	Document Review/ Examination	Examination
238. (QI-SPL-14)	--	--	--	X
239. (QI-SPL-15)	--	--	--	X
240. (QI-SPL-16)	X	--	--	--
241. (QI-SPL-17)	--	--	--	X
242. (QI-SPL-18)	--	--	--	X
243. (QI-SPL-19)	--	--	--	X
244. (QI-SPL-20)	--	--	--	X
245. (QI-SPL-21)	--	--	--	X
246. EC-SPL-2 (General Group "J")	--	--	--	X
247. EC-SPL-3 (General Group "E")	--	--	--	X
248. EC-SPL-5 (General Group "H")	--	--	--	X
249. (EX-SPL-1)	--	--	--	X
250. (EX-SPL-2)	--	--	--	X
251. (EX-SPL-3)	--	--	--	X
252. (EX-SPL-4)	--	--	--	X
"A" ASME (Small Bore)	--	--	--	X
"B" ASME (Large Bore)	--	--	--	X
"C" ANSI B31.1 and B31.5	--	--	--	X
"D" Civil (Subsequent to February 13 1981)	--	--	--	X
"E" Civil (Prior to February 13, 1981), Coincides with EC-SPL-3,	--	--	--	X
"F" Pipe Supports	--	--	--	X
"G" I&C Supports (Subsequent to February 13, 1981)	--	--	--	X
"H" I&C Supports (Prior to February 13, 1981), Coincides with EP-SPL-5	--	--	--	X.
"I" Electrical Supports (Subsequent to February 13, 1981)	--	--	--	X
"J" Electrical SUpports (Prior to (Prior to February 13, 1981), Coincides with EC-SPL-2	--	--	--	X

Group Number and/or Origin	Method of Investigation/Verification: Document Review	Engineering Evaluation	Document Review/ Examination	Examination
"K" HVAC Supports (Subsequent to February 13, 1981)	--	--	--	X
"L" HVAC Supports (Prior to February 13, 1981)	--	--	--	X
"M" HVAC Duct, Coincides with EC-SP-15	--	--	--	X
Method of Investigation/Verification Totals	21	7	6	67

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Examination Group Status
(After Consolidation and Closure)

Group Type	Document Review	Engineering Evaluation	Document Review/ Examination	Examination
Specifics	0	0	4	16
Specials	0	1	2	20
Generals	0	0	0	13
Combined Totals	0	1	6	49

Total Groups: 56

IORR WEP 501

QUESTION 1

ATTACHMENT 2

EG&G Idaho

FORM EG&G-460A
(Rev. 05-84)

NOTEGRAM

We keep our commitments.

Date April 19, 1986

A. E. Bradford — From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. — Org. Quality Indicator

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 20 (QI-SP-7)

1. Definition:

   Lost weld inspection documentation

2. Justification:

   NCR 5807 identifies specific welds for which documentation cannot be located.

   A. Problem:

      Weld records showed "completed" status in the accountability program and cannot be located or reconstructed.

   B. Boundary:

Weld Maps	Weld Numbers
427-2 Sheet 44	1-003B-T080-06
555-5 Sheet 1-2	2-062A-T001-06
555-5 Sheet 1-2	2-062A-T001-07
555-5 Sheet 1-2	2-062A-T001-09
555-5 Sheet 1-2	2-062A-T001-12
555-5 Sheet 1-2	2-062A-T001-19
555-5 Sheet 1-2	2-062A-T001-20

3. Comments: N/A

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Approved: A. E. Bradford Date: 4/22/86

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Date April 19, 1986

A. E. Bradford — From D. Cochran

Org. Employee Concerns/Quality Indicator Assess — Org. Quality Indicator

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 21 (QI-SP-8)

1. Definition:

   Welds not inspected and documented.

2. Justification:

   NCR 3454R identifies a structural steel/partition wall with welds that were not documented.

   A. Problem:

      Welds not inspected and no documentation for welds in partition wall.

   B. Boundary:

      Welds in structural steel partition wall 48N1322-1.

3. Comments: N/A

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Org. Employee Concerns/Quality Indicator Assess. — Org. Quality Indicator

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 22 (QI-SP-9)

1. Definition:

   Sections (4" x 5") were cut from embedded frames without documentation or approval.

2. Justification:

   NCR 4522R identifies sections cut from embedded frames and subsequent repair without written approval.

   A. Problem:

      Sections were cut from the bottom side of frames and then replaced. The sections replaced on Unit 1 side appear to have a weld only on the inside and does not fully penetrate the thickness of the member.

   B. Boundary:

      Embedded frames MK16 and MK100 at 8'-0" east of A5 and 9'0" south of U-line.

3. Comments: N/A

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Date August 15, 1986

To A. E. Bradford From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicator

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 23 (QI-SP-10)

1. Definition:

   Arc strikes on Unit 1 reactor Coolant Pumps 3 and 4.

2. Justification

   NCR 1315R, CAR 78-1, and CAR 78-2 identified seven (7) arc strikes on pumps 3 and 4. No verification was made of minimum wall thickness.

   A. Problem:

      Seven arc strikes on the inside of reactor coolant pumpe 3 and 4 casings. Tennessee Valley Authority (TVA) stated they did not check minimum wall thickness due to lack of proper UT equipment.

   B. Boundary:

      Unit 1 reactor coolant pumps 3 and 4.

Comments: Closed

Approved: A.E. Bradford /kk Date: 8/16/86

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A. E. Bradford

From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicator

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 24 (QI-SP-11)

1. Definition:

   Seismic pipe supports that contain defective welds.

2. Justification:

   NCR 4139R identified numerous weld defects on four (4) specific pipe supports.

   A. Problem:

      Seismic pipe supports installed and inspected in accordance with QCP 4.8. Subsequent voiding of this documentation and reinspection in accordance with QCP 4.23 identified numerous weld defects in specific supports.

   B. Boundary:

      Seismic pipe supports 78-1FPC-R9. R10, R11, and R12.

3. Comments: N/A

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 26 (QI-SP-13)

1. Definition:

   Welds inaccessible for cleaning therefore they cannot be inspected.

2. Justification:

   NCR 3450R identifies two (2) specific duct supports with welds that are inaccessible for inspection. The NCR was subsequently voided without justification.

   A. Problem:

      Quality of welds that are inaccessible is indeterminate. The NCR that documents this inaccessibility was voided without approval.

   B. Boundary:

      Duct supports 0-65-RB-H-2001
      0-65-RB-H-2002

3. Comments: N/A

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Org. Quality Indicator

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 27 (QI-SP-14)

1. Definition:

   ANSI B31.1 hot functional performed in lieu of ASME Section III hydro-static test after weld repair.

2. Justification:

   NCR 3782 identifies specific welds that will not be hydrostatically tested per ASME Section III.

   A. Problem:

      A leak test per ANSI B31.1 was substituted for a required ASME Section III hydrostatic test.

   B. Boundary:

      One (1) inch and two (2) inch steam generator blowdown lines.

3. Comments: Closed

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 28 (QI-SP-15)

1. Definition:

   Welding performed without approved instructions.

2. Justification:

   CAR 82-10 identified a specific component that was welded without approved instructions.

   A. Problem:

      Welding was performed on Diesel Air Dryer 1A-1 without approved instructions.

   B. Boundary:

      Diesel Air Dryer 1A-1.

3. Comments: Closed

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 29 (QI-SP-16)

1. Definition:

   Incorrect schedule pipe installed.

2. Justification:

   NCR 5495 identifies specific vent lines and welds that are incorrectly installed.

   A. Problem:

      1/2 inch vent lines should be schedule 40 pipe. Tennessee Valley Authority (TVA) installed schedule 80 pipe.

   B. Boundary:

      Weld numbers: 1-067C-T260-74, 75, 76, 77
      1-067C-T407-01, 02
      1-067C-T406-01, 02

3. Comments: Closed

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Date August 15, 1986

To E. Bradford From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicator

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 30 (QI-SP-17)

1. Definition:

Unqualified welder performed welds.

2. Justification

NCR 4868 identified specific welds that were perfromed by an unqualified welder. NCR's 5304 and 5330 also identify specific welds with operations performed without certification.

A. Problem:

Reactor coolant system fabrication process control operation sheet for subassembly 1-68-L-226-7 indicates for weld 1-068F-T072-20 that welder 6SSX performed the weld. This welder is uncertified. NCR 5304 identified nine welds performed by an uncertified welder. NCR 5330 identified a weld had been performed without verification that the welder was certified to use the filler metal indicated.

B. Boundary:

Subassembly 1-68-L-226-7, weld 1-068F-T072-20. (NCR 4868)
Weld 1-003C-T237-01 (NCR 5304)
1-003C-T237-06 (NCR 5304)
1-003C-T237-11 (NCR 5304)
1-003C-T237-12 (NCR 5304)
1-003C-T237-13 (NCR 5304)
1-003C-T237-14 (NCR 5304)
1-003C-T237-22 (NCR 5304)
1-003C-T237-23 (NCR 5304)
1-003C-T237-24 (NCR 5304)
Weld 1-67B-T221-03 (NCR 5330)

3. Comments: Closed

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 31 (QI-SP-18)

1. Definition:

   Containment vessel penetrations have inside diameters and weld prep thicknesses that are not within the specified tolerances of the vendor.

2. Justification:

   NCR 1047R identifies specific penetrations that have out of tolerance dimensions on inside diameters and weld prep thicknesses.

   A. Problem:

      Containment vessel penetrations have inside diameters and weld prep thicknesses that are not within the specified tolerances of CBI drawings 72-4333-320R2 and 72-4333-313 R2.

   B. Boundary:

      Containment vessel penetrations 13A, 13B, 13C, 12B, and 12C.

3. Comments: N/A

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From D. Cochran

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 32 (QI-SP-19)

1. Definition:

   Defective welds on seismic pipe support.

2. Justification:

   NCR 4477R identifies specific welds that are defective.

   A. Problem:

      Seismic pipe support has defective welds.

   B. Boundary:

      Seismic pipe support 70-ICC-R487.

3. Comments: N/A

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Date April 25, 1986

To: A. E. Bradford

From C. D. Cooper

Employee Concerns/Quality Indicator Assess.

Org. Employee Concerns

Address

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SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 33 (EC-SP-16)

1. Definition:

   Unacceptable welds.

2. Justification:

   Two employee concerns identified a problem with welds on a specific structural beam at a specific location.

   A. Problem:

      Unacceptable welds.

   B. Boundary:

      The Unit 1 hanger at beam W33 x 200 in the South Valve Room at elevation 754' 10", 1-H and 11-H on the vertical welds.

3. Comments: N/A

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Date: 4/25/86

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Date April 19, 1986

A. E. Bradford From C. D. Cooper

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Address Address

SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 34 (EC-SP-17)

1. Definition:

   Crack extending into the weld zone.

2. Justification:

   The employee concern identifies a specific location on a specific system where a crack exists in a valve body and that extends into the weld zone.

   A. Problem:

      Crack extending into the weld zone.

   B. Boundary:

      The Unit 1 welds on the system 68, three inch stainless steel line on top of the pressurizer with a valve installed in the line.

3. Comments: N/A

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To E. Bradford From C. D. Cooper

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Address Address

SUBJECT: JUSTIFICATION FOR SPECIFIC GROUP FORMATION--SPECIFIC GROUP NUMBER 35 (EC-SP-15)

1. Definition:

   Weld uninspected.

2. Justification:

   The aggregate of employee concerns and Quality Technology Company (QTC) investigation identified the HVAC duct work as not having visual weld inspection. Tennessee Valley Authority (TVA) has justified not performing HVAC duct inspection. Weld Evaluation Project (WEP) will evalute TVA's justification for testing in lieu of inspection as a specific group.

   A. Problem:

      Welds not inspected.

   B. Boundary:

      All safety-related Unit 1 HVAC duct.

3. Comments: N/A

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Date August 15, 1986

To A. E. Bradford

Employee Concerns/Quality Indicator Assess.

From D. Cochran

Org. Quality Indicator

Address

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 36 (QI-SP-1)

1. Definition:

   Arc strikes on pressure relief tank.

2. Justification

   NCR 717R identifies a specific arc strike on a specific tank.

   A. Problem:

      Ark strike in shell of PR tank caused by a shorted electrical cable.

   B. Boundary:

      Unit 1 pressure relief tank WAT-RCATPR-Q1.

3. Comments: Closed

Approved: A.E. Bradford /KR Date: 8/16/86

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A. E. Bradford — From H. Richardson

Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 201 (EC-SPL-1)

1. Definition:

   Welds performed using the Shielded Metal Arc Welding (SMAW) process.

2. Justification:

   The aggregate of the 24 employee concerns involved in this group deal with the issue and control of coated weld electrodes. The primary concern is that incorrect weld rod may have been issued and used and that coated electrodes were exposed to the atmosphere for extended periods thereby absorbing moisture. The coated weld electrode referenced would only be used on SMAW type welds. The potential defects would include hydrogen embrittlement in carbon steels with a carbon equivalent above .45, and porosity and undercut in other materials. WEP weld engineering has determined that carbon steel welds performed with SMAW process should be evaluated for the potential defects. Because of the large number of welds this problem should be evaluated by sample inspection. The unique nature of the potential problem and available inspection technique (hardness testing) preclude including this group as a component of the general examination groups.

   A. Problem:

      Twenty four concerns identified a problem with the issue, control and possible substitution of coated weld rod.

      The potential weld defects associated with the use of damp weld rod (extended atmospheric exposure) include porosity, undercut and hydrogen embrittlement.

   B. Boundary:

      All carbon steel welds within Unit 1 including piping, hangers, supports and structural items welded using the SMAW process.

      The sample inspection will require a special test for hardness which will require separation from the general examination groups.

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3. Comments:

A. There are 24 employee concerns that identify problems that are considered violations of an adequate weld filler control system. The majority of the concerns address inadequate control or perceived problem with handling of coated electrodes. The concern subjects are as follows:

- o failure to follow rebake procedures
- o failure to properly store electrode after issue
- o weld rod issue and return violations.
- o transfer of rod from one welder to another
- o weld rod traceability to usage problems
- o control does not meet code requirements
- o rod mixed when issued (material substitution).

B. Employee Response Team (ERT) investigation of most of the 24 concerns has been completed and the conclusion is that the concerns are substantiated.

C. WEP review of the concerns indicates that the most frequent problem is failure to heat or dry coated electrodes. Rod which is not returned is typically exposed to atmosphere between three and 16 hours.

D. WEP engineering has evaluated the effects of using wet weld rod and has determined that the only material which would exhibit any detrimental effect would be carbon steels with carbon equivalent above 0.45 (Report is being prepared).

E. WEP weld engineering has evaluated the potential for the substitution of E309 for 7018 weld rod. The engineering evaluation indicates that it would be highly unlikely that a welder would use E309 in place of 7018 even though the rod might be substituted when issued (Report is being prepared).

F. QTC has been asked what action welders took when encountering poor quality flux. Consistently the answers were that the rod was changed and in process repairs were completed. (This question was ask for another group of concerns which deals with weld rod quality).

G. WEP weld engineering has determined that hardness testing may be required to evaluate welds where (CMTR's) are unavailable. This requirement should be applied to as small a group as possible rather than to the samples in the general groups.

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Date April 18, 1986

A. E. Bradford — From H. Richardson

Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER EC-SPL-2 (GENERAL GROUP J)

1. Definition:

   Electrical Supports.

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Seven employee concerns identified a problem with electrical supports in which document falsification, undercut and unacceptable welds was claimed. Additionally it is charged that sampling by Tennessee Valley Authority (TVA) for acceptance was performed incorrectly and that the samples were repaired prior to sample inspection.

   B. Boundary:

      Safety related Unit 1 electrical support fabricated prior to February 13, 1981.

3. Comments:

   It is implied in the concerns that the statement "could not pass todays criteria" is referring to "special TVA acceptance criteria for cable tray supports made prior to February 13, 1981.

   The February 13, 1981 date for modification of AWS D1.1 acceptance criteria resulted from construction identifying a significant amount of welds in all areas of AWS D1.1 welding which did not meet AWS D1.1 acceptance criteria.

   Construction requested ENDES to relax AWS D1.1 requirements through design evaluation to prevent unnecessary rework.

   During the February 1981 time frame ENDES established 2 different acceptance criteria, one for welds performed prior to February 13, 1981 and for welds performed after February 13, 1981. These differing acceptance criteria have been incorporated into the QCP 4.13 inspection criteria.

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Approved: A. E. Bradford Date: 4/19/86

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Date April 18, 1986

To A. E. Bradford From H. Richardson

Org. Employee Concerns/Quality Indicator Assess. Org. Employee Concerns

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER EC-SPL-3 (GENERAL GROUP E)

1. Definition:

   Unit 1 safety-related civil structures and miscellaneous steel installed prior to February 13, 1981.

2. Justification:

   Three employee concerns related problems associated with the inspection criteria applied prior to February 13, 1981, with sampling performed to determine the existing weld quality and with the rework performed to correct deficiencies in welding performed prior to the cut-off date.

   The concerns are related to a large group of welds on structural steel and structural steel on supports, and is associated with the fabrication period prior to February 13, 1981. While the weld discrepancies are not specified, it is indicated that the acceptance criteria was improperly applied, implying that the welds do not comply with the specification requirements.

   A. Problem:

      Welds not evaluated by the inspection group to correct acceptance criteria.

      Sampling inspection not properly performed.

      Rework completed before inspection identification of defective welds completed.

   B. Boundary:

      Structural and miscellaneous steel installed before February 13, 1981.

3. Comments:

   A. WEP review has determined that a significant change occurred in the inspection program at February 13, 1981. (See EC-SPL-2 Justification Form for Details).

   B. WEP review has also found that a relaxation of acceptance requirements was approved by TVA during the February 13, 1981 time frame for welds that were performed prior to that date.

   C. Preliminary WEP review of NCR 2374 indicates the problem is associated with the ENDES review of AWS welds.

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Date April 18, 1986

A. E. Bradford

From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess.

Org. Employee Concerns

Address

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 202 (EC-SPL-4)

1. Definition:

Welds made by unqualified apprentice electricians on electrical supports in the auxiliary building.

2. Justification:

The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

A. Problem:

Approximately 100 electrical supports were welded by apprentice electricians not qualified to weld.

B. Boundary:

All electrical supports located in the Auxiliary Building Floor elevation 713 feet.

Exclude from the general group welds made by unqualified welders that have not been corrected.

3. Comments:

Concern indicates approximately 100 electrical supports located in the boundary stated above were welded by apprentice electricians not qualified to perform welding, approximately 1980-1981 time frame. No further information as to specific location of these supports has been obtained. Requested information from TVA on documentation of correction, such as; NCR or repair sheets.

TVA identified NCR 2375 which addressed poor workmanship and contained a sampling program which samples cable tray and conduit supports during the above time frame. This NCR addresses workmanship for the whole plant and did not address welding by unqualified welders or repair of such welds.

Separation of the specified boundary for electrical supports will eliminate from the general group an area identified as having welds made by unqualified welders that have not been corrected.

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Date April 18, 1986

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Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER EC-SPL-5 (GENERAL GROUP H)

1. Definition:

   Instrument supports installed prior to February 13, 1981 and not already identified as nonconforming under NCR W-334-P Rev 0.

2. Justification:

   A single concern identifies a problem in which a welding reinspection program was performed to resolve weld deficiencies in pipe hangers, cable tray supports and conduit supports. The outcome of this sampling inspection program was a 10 CFR 50.55(e) notice of violation report to the Nuclear Regulatory Commission (NRC) regarding discrepancies in weld size, length, missing welds, etc.

   The concern alleges that the sampling reinspection program did not address instrument support welds installed during the same period.

   The concern has been substantiated by Nuclear Safety Review Staff (NSRS) investigation.

   A. Problem:

      Instrument support welds were not reinspected and deficiencies resolved when the other American Welding Standard (AWS) welds were reinspected.

   B. Boundary:

      Instrument support welds installed before February 13, 1981 and not identified as nonconforming under NCR W-334-P Rev 0.

3. Comments:

   A. WEP review has determined that a significant change occurred in the inspection program at February 13, 1981. (See EC-SPL-2, General Group H, Justification for Special Group Formation for details).

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Date April 18, 1986

A. E. Bradford — From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 203 (EC-SPL-6)

1. Definition:

   Welding of pipe which does not conform to the required joint preparation.

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Lack of or improper preparation of welded joints. Concerned individual identified lack of bevel on pipe.

   B. Boundary:

      Safety related fire protection system welds in the Number 5 Diesel Generator Building.

3. Comments:

   Improper preparation of a piping joint could lead to unexpected failure of a joint. Sampling of the above stated boundary using appropriate Nondestructive Examination (NDE) to detect lack of bevel will establish the statistical probability of the extent or existence of the stated concern.

   Questions answered by QTC established the above boundary. The sampling of the above stated boundary by NDE such as RT or UT to research the identified concern should be limited to a special group to eliminate this type of inspection from a general population unless specifically required by referenced piping code.

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(Rev. 05-84)

Date April 18, 1986

A. E. Bradford — From H. Richardson

Org. Employee Concerns/Quality Indicator Assess — Org. Employee Concerns

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 204 (EC-SPL-7)

1. Definition:

   Heavy wall intake piping between the pump house and the reactor.

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      One employee concern identified a problem in which the heavy wall intake pipe was welded using 6010-P5 weld rod rather than 7018.

   B. Boundary:

      Heavy wall intake piping between the pump house and the reactor.

      This special group is formed to review data to determine what weld procedures were allowed, which were used, and which weld rod was used.

3. Comments:

   Preliminary WEP review has provided the following information:

   A. The concerned employee identified a 32 inch diameter pipe run from the pumphouse at the river to the reactor. WEP has determined that there is no 32 inch diameter pipe in this run. There is 30 inch and 36 inch pipe. WEP has requested QTC to obtain clarification of the pipe size from the employee.

   B. WEP has determined by review of the Weld Management Information system log and the weld rod issue slips for the subject systems that all procedures required use of 7018 weld rod.

   C. WEP has determined that most of this pipe is buried and therefore inaccessible except in the area of the pumphouse and the reactor building.

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Approved: A. E. Bradford — Date: 4/19/86

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FORM EG&G-460A
(Rev. 05-84)

Date September 9, 1986

A. E. Bradford — From H. Richardson

Org. Employee Concerns/Quality Indicator Asses — Org. Employee Concerns

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 205 (EC-SPL-8)

1. Definition:

Welds inspected through paint (carbo-zinc primer).

2. Justification:

The aggregate of 14 employee concerns dealing with inspection through paint have raised sufficient question about the ability of inspection personnel to adequately evaluate the individual weld quality characteristics for acceptability. Tennessee Valley Authority (TVA) performed an evaluation and issued a technical justificatic for authorization of inspection through carbo-zinc primer. TVA recinded this authorization January 23, 1984.

The formation of a special group will address the effect of inspection through carbo-zinc primer and give a statistical basis for evaluation on finished weld quality.

A. Problem:

Inspection through paint may not be able to detect important weld quality indicators such as cracks, lack of fusion, and porosity.

B. Boundary:

All American Welding Society (AWS) D1.1 welds fabricated prior to November 2, 1981, where inspection through carbo-zinc primer is in question.

3. Comments:

WEP review has determined that the inspection through paint issues were concernin time when this practice was allowed during a re-inspection effort. This effort w completed using a sampling plan and the results were used to justify acceptance o large number of hangers. The concerns address the fact that hangers were accepte without proper inspection, i.e. the ones inspected through paint and those accept because of the sampling inspection that may not have been included in the sample.

Approved: A E Bradford Date: 9/10/86

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FORM EG&G-460A
(Rev. 05-84)

Date September 9, 1986

To A. E. Bradford

From C. D. Cooper

Employee Concerns/Quality Indicator Assess.

Org. Employee Concerns

Address

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 206 (EC-SPL-9)

1. Definition:

PDO's (Protective Devices) unsatisfactory weld appearance.

2. Justification:

The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

A. Problem:

Poor quality welds on protective devices PDO.

B. Boundary:

All Unit 1 safety-related PDO devices located in the reactor building and North and South Valve Rooms.

3. Comments:

Extensive review of PDOs has been completed by WEP and is on file under EC-SPL-9. PDOs have been identified on NCR 3001 and 3325. Extensive reinspection by TVA has been completed. WEP is reviewing the extent of this reinspection and will evaluate TVA's inspection documents for adequacy. Actual field inspection may not be required dependant upon the results of the WEP documentation review.

Special Groups 206 and 217 are related since both groups identify welding issues associated with protective devices. WEP has determined that the employee concern and NCR identified problems are coincidental.

Approved: A. E. Bradford Date: 9/10/86

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(Rev. 05-84)

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Date April 18, 1986

A. E. Bradford — From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 207 (EC-SPL-10)

1. Definition:

   Unit 1 Steam Generator Supports

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Steam generator supports welded without proper preheat.

   B. Boundary:

      Unit 1 Steam Generator Supports welded by TVA.

      Evaluation of this problem may require special testing. Separation of this group from a general population is required.

3. Comments:

   These employee concerns identified possible problems with the lack of preheat when welding on the steam generator supports.

   DOE/WEP will review the associated weld procedures to verify what preheat and post-weld heat treatment requirements were invoked. If preheat is required without evidence of post-weld heat treatment evaluate using an inspection/NDE technique appropriate to detect the effects of improper preheat and subsurface defects.

   WEP review indicates material thickness exist in the steam generator support steel that would require preheat. Further review indicates that the steel used for the steam generator supports, was fabricated by a vendor (Bristol Steel) and installed by TVA only the installation welds made by TVA need to be included in this special group.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 208 (EC-SPL-11)

1. Definition:

   Thread-o-lets welded to drain lines.

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

   Two employee concerns identified problems with thread-o-lets being welded by unqualified personnel, resulting in unacceptable welds, some of which were not reworked.

   B. Boundary:

   Thread-o-lets welded to instrument panel drain headers for systems 62, 63 and 68 in the reactor and Auxiliary Buildings.

3. Comments:

   A preliminary WEP review provided the following information.

   A. Drawing 47W600-0-4 R21 Note 18 states that all instrument drain lines are TVA Class G when located in seismic buildings. The systems identified are in seismic buildings.

   B. WEP review of thread-o-let installations on these systems identified potential insufficient weld filler metal.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 209 (EC-SPL-12)

1. Definition:

   Pressure boundary welds requiring post weld heat treat where the post weld heat treat (PWHT) log was used to record the need for heat treat.

2. Justification:

   A single employee concern identified a problem in which temporary attachments had been made to a system and were left installed even though the record indicated removal had been accomplished.

   Tennessee Valley Authority (TVA) control of these attachments were done by the PWHT log.

   The attachments were found during a follow-up inspection during the Nuclear Safety Review Staff (NSRS) investigation of the concern.

   A. Problem:

      Temporary attachment left on systems when they should have been removed.

   B. Boundary:

      All safety-related Unit 1 temporary attachments identified on the PWHT log.

3. Comments:

   A. The NSRS investigation indicates the temporary attachments were thermocouples which had been put in place to monitor post weld heat treat.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 210 (EC-SPL-13)

1. Definition:

   Welds made by welders with questionable certification.

2. Justification:

   The aggregate of 5 employee concerns identified 10 welders with questionable certification. Formation of a special group for these welders will give a statistical basis for evaluation of the quality of welds made by these welders.

   A. Problem:

      Welds made by welders with questionable certification.

   B. Boundary:

      All safety-related Unit 1 welds made by welders 01A22, 01B13, 01A31-1 through 01A31-8.

3. Comments:

   A. Questions to Quality Technology Company (QTC) on numerous concerns were answered by QTC providing welder names or I.D. Numbers. These responses have been addressed in establishing the special group.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 211 (EC-SPL-14)

1. Definition:

   Unit 1 safety-related main steam piping welds made by welders who were qualified using the flat (1G) position.

2. Justification:

   A single employee concern related a problem in which a welder who was only qualified by a flat plate test performed welding on the main steam line.

   The implication is that on a definable population of welds there may exist unacceptable welds because of the welding was performed by an improperly qualified individual.

   A. Problem:

      Potential unacceptable welds because they were made by an unqualified welder.

   B. Boundary:

      All welds on the Main Steam Line made by welders qualified by the flat plat test.

3. Comments:

   A. Weld Evaluation Project (WEP) preliminary review was unable to determine the population size of this group. If further investigation indicates the group is small this item may be considered as a specific rather than a special group.

   B. WEP has requested more information from Quality Technology Company (QTC) in an attempt to further define the potential problem and the boundary.

   C. WEP has determined that welds on the main steam lines are performed by steam fitters. All steam fitters that welded on the Main steam line were qualified by welding on pipe.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 212 (EC-SPL-15)

1. Definition:

   Radiographed welds on pipe lines which penetrate the containment wall.

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      One employee concern identified a problem in which a group of welds may have been ground below allowable wall thickness to accommodate radiography.

   B. Boundary:

      First weld on piping beyond the containment penetrator inside the containment where original inspection or ISI required radiography.

3. Comments:

   WEP requested information from QTC to better define the problem and boundary as listed below:

   A. WEP ask if any specific lines were more likely than others to have been overground. The concerned employee could not provide any more information.

   B. WEP ask if the concerned employee could provide a specific type of weld. QTC responded it was open butt/no backing ring, GTAW.

   C. WEP ask if the welds were near a penetration. The QTC response indicates they are the first weld off the penetrations.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 213 (EC-SPL-16)

1. Definition:

Stainless steel refueling pit liners.

2. Justification:

The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

A. Problem:

Stainless steel refueling pit liners were welded in the rain causing bad weld porosity.

B. Boundary:

Unit 1 safety related refueling pit liner welds inside the containment building

3. Comments:

QTC response to EG&G KGT-43-86 File Number 843

Information requested--can the concerned individual identify the specific weld or welds.

Response:

The weld are located in the refueling pit. The welds were made by ironworkers prior to the reactor building dome being placed. The welds were made while it was raining and water was trapped in the weld causing porosity.

No additional information available.

NOTE: WEP has determined that the refueling pit liner is safety related.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 214 (EC-SPL-17)

1. Definition:

   Structural steel members located in the North and South Valve Rooms.

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      One employee concern indicated that welds on structural steel members did not receive proper preheat.

   B. Boundary:

      Structural steel members located in the North and South Valve Rooms and fabricated during the winter of 1983.

3. Comments:

   A. This condition is further substantiated by the investigation of concern PH-85-027-001 where interviews with welders indicated that preheat temperatures were not properly performed.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 215 (EC-SPL-18)

1. Definition:

   Weld made with interpass temperature exceeded.

2. Justification:

   The concern or aggregate of concerns including Quality Technology Company (QTC) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Welds made without control of interpass temperature.

   B. Boundary:

      All Unit 1 safety related welds requiring interpass temperature control. P8 materials become sensitized in the heat affected zone but P1 materials are not affected. WEP weld engineering is evaluating this sensitization issue to develope an effective approach to address this problem. Populating this group is not necessary because standard NDE will not detect the sensitization of P8 material. WEP weld engineering's evaluation will address P8 material sensitization for the plant.

3. Comments:

   Supplementing the two concerns addressing this problem is an NRC violation written in 1978 on inadequate control of interpass temperature (reference Group No. 218, QI-SPL-2).

   This NRC violation was closed but did not address the impact on work performed prior to closure of this violation.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 216 (EC-SPL-19)

1. Definition:

   Unit 1 safety-related instrument lines and heat exchanger piping located in the reactor building, South Fan Room.

2. Justification:

   One employee concern identified a potential problem in which there was no method/objective evidence available to verify that welders had used a process as required for qualification updating.

   This problem has been identified as affecting a group of welds in heat exchangers and instrument lines in the South Fan Room and were performed by the pipe fitter welder group.

   A. Problem:

      Potentially defective welds because the welders had not maintained there qualification for the procedures being used.

   B. Boundary:

      Instrument lines and heat exchanger piping located in the South Fan Room.

3. Comments:

   A. At Weld Evaluation Project (WEP) request Quality Technology Company (QTC) contacted the concerned individual and determined that the welds were on instrument lines and heat exchanger piping in the South Valve Room.

   B. The Employee Response Team (ERT) evaluation determined that a problem had existed with welder qualification. A Stop Work Order was issued on August 23, 1985 to stop all welding activity. The welders were recertified before resuming welding except for those recertified within 90 days pervious to the Stop Work Order.

   C. The ERT investigation recommends that past problems with welder qualification must still be evaluated.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 217 (QI-SPL-1)

1. Definition:

   Questionable welding on PDO's protective devices.

2. Justification:

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Incomplete corrective action. TVA did not address all protective devices. Only pipe rupture sleeves.

   B. Boundary:

      PDO's installed prior to January 1981. Unit 1 safety related PDO's except pipe rupture protective sleeves.

3. Comments:

   Extensive review of PDOs has been completed by WEP and is on file under EC-SPL-9. The PDO's have been identified on NCR 3001 and 3325. Extensive reinspection by TVA has been completed. WEP is reviewing the extent of this reinspection and will evaluate TVA's inspection documents for adequacy. Actual field inspection may not be required dependant upon the results of the WEP documentation review.

   Special Groups 206 and 217 appear to be related. Verification and/or required examination will be combined as one effort.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 218 (QI-SPL-2)

1. Definition:

   Inadequate control of interpass temperature.

2. Justification:

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Closure of NRC item 390/78-31 did not address impact on prior work.

   B. Boundary:

      All Unit 1 safety related welds requiring interpass temperature control. P8 material becomes sensitized in the heat affected zone. Does not affect P1 material. WEP weld engineering is evaluating this sensitization issue to develop a effective approach to address this problem. Populating this group is not necessary because standard NDE will not detect the sensitization of P8 material. WEP weld engineering's evaluation will address P8 material sensitization for the plant.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 219 (QI-SPL-3)

1. Definition:

   Welds on duct supports in the Control Building.

2. Justification:

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Safety related HVAC duct supports are reported in NCR2819R to have deficient welds including undersized welds, slag inclusion, porosity, undercut and overlap.

   B. Boundary:

      Safety related HVAC duct supports in the control building.

3. Comments:

   This problem was reported in NCR 2819. This NCR was subsequently voided and referenced to NCR 2576. However, NCR 2576 only deals with bolt holes in the baseplates and not with weld defects.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 220 (QI-SPL-4)

1. Definition:

   ASME small bore pipe welds.

2. Justification:

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Five NCR's were found that identified a problem in which purge requirements during the welding operation were not documented as being verified, implying the required purge was not accomplished. In addition one of the NCR's identified a situation in which PT examination was accomplished after the ANI acceptance was completed. Review of the NCR's indicates that TVA resolution of the reported discrepancies was incomplete or inadequate.

   B. Boundary:

      All safety related small bore pipe welds.

3. Comments:

   A. This group includes small bore weld-o-lets, sock-o-lets welded to various pipe sizes, tubing to needle valve, tubing to union and various other configurations.

   B. The deficiencies indicated in the NCR's are that the O_2 purge was not documented on the weld record but was marked N/A instead. It is undetermined if the purge was accomplished.

   C. TVA engineering has performed an engineering analysis which is included in the NCR disposition, that indicates the lack of O_2 purge would not cause the weld to be unsatisfactory for service.

   D. WEP review of the NCR's concluded that the analysis and corrective action was incomplete or incorrect.

   E. Because of the configuration of the fitting to pipe, radiography may not be effective in detecting sugar in the weld root. (Most likely problem caused by lack of purge).

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F. Recommend that a special group be formed of ASME small bore pipe and a document review by performed on a sample of field weld operation sheets (FWOS) to determine the extent of nondocumented O_2 purges.

1. If a sample (95/95) reveals adequate documentation, and further WEP engineering review of the NCR dispositions and analysis concludes the identified deficiencies can be accepted, this group should be dispositioned to close.

2. If the sample (95/95) reveals unacceptable documentation or the WEP engineering review of NCR documentation indicates an unacceptable corrective action, the problem should be reported and resolved in accordance with SP WEP 3.2.2.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 221 (QI-SPL-5)

1. Definition:

   Evaluate adequacy of the sample plan used for NCR 2375R.

2. Justification:

   Disposition by ENDES directed a sample of drawings to be inspected. the original sample size was 106 drawings and was reduced to 57 without statistical validation to warrant the reduction.

   The sampling was to be preformed on cable tray supports, conduit supports on miscellaneous steel.

   A. Problem:

      Sample inspection for acceptance was changed and statistical validity is questionable.

   B. Boundary:

      Sampling plan used for NCR 2375R as it applies to cable tray supports, conduit supports, and miscellaneous steel.

3. Comments:

   A. Weld Evaluation Project (WEP) data review has determined that even at the reduced sample rate of 57 rather than 106, defective welds were found and corrected. NCR 3054 was issued to document nonconforming conditions. Even though the sample contained defective welds, there is no evidence that the sample size was increased.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 222 (QI-SPL-6)

1. Definition:

   Platforms, ladders and stairs in Category 1 structures.

2. Justification:

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Welds on the identified group were determined by TVA to not meet drawing requirements. One NCR has documented the problem and has not been closed.

   B. Boundary:

      Platforms, ladders and stairs in Category 1 structures erected and documented prior to January 1, 1981.

3. Comments:

   A. A condition was reported by NCR 3579 in which the welding on platforms, ladders, and stairs in Category 1 structures erected and documented prior to January 1, 1981, was not in conformance with the drawing requirements.

   B. TVA evaluation concluded that the inspections had not been performed in strict compliance with requirements at the time of installation.

   C. TVA instituted a sampling plan to determine the quality of the weld population involved and attempted to resolve the NCR by this sample inspection.

   D. The NCR was not yet closed at the time WEP review was performed.

   E. The sample size had been reduced from the original plan.

   F. The acceptance requirements were reduced from the G29 specification for purposes of sampling.

   G. WEP should inspect a sample from this group and evaluate in accordance with appropriate acceptance requirements.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 223 (QI-SPL-7)

1. Definition:

   Inspections performed by an uncertified inspector.

2. Justification:

   A. Problem:

      Inspector transferred from another site to Watts Bar Plant. His prior Level II certification was revoked and he was not immediately recertified upon starting inspections at WBNP. All hangers inspected while uncertified were reinspected but results of this reinspection is indeterminate.

   B. Boundary:

      All hangers inspected by this inspector while uncertified.

3. Comments:

   Review of NCR 4370 Rev. 0 indicates that a total reinspection may have been performed but the actual results of the reinspection was not indicated.

   There is no indication if the reinspection was acceptable or if rejectable welds were found.

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SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 224 (QI-SPL-8)

1. Definition:

   Welds attaching lugs to pressure boundary components.

2. Justification:

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Twenty-three NCR's were involved in reporting weld deficiencies associated with attaching lugs to pressure boundary components. Data indicates that through 1983 the inspection of these welds was not being evaluated in accordance with correct acceptance criteria.

   B. Boundary:

      All safety related welds attaching lugs to pressure boundary components.

3. Comments:

   A. Extensive data is present in the record book being maintained by WEP.

   B. This problem continued over several years. It appears that retraining of personnel was ineffective in assuring that the inspection criteria would be properly implemented.

   C. Corrective action for defective welds appears to be ineffective.

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Approved: A. E. Bradford Date: 4/19/86

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FORM EG&G-460A

NOTEGRAM

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Date August 15, 1986

To A. E. Bradford From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicator

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 225 (QI-SPL-9)

1. Definition:

   Welding does not meet inspection criteria.

2. Justification

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Incomplete corrective action. No impact assessment. Not clear that reinspection/rework was accomplished.

   B. Boundary:

      Safety related conduit supports on elevation 708 feet in the Control Building per 47A056 and 47A050 series drawings.

      1. Verify associated documentation is in the vault as noted on NRC 2629.

      2. if documentation is not available and satisfactory, implement reinspection.

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FORM EG&G-460A
(Rev. 05-84)

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Date April 18, 1986

A. E. Bradford

From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess.

Org. Employee Concerns

Address

Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 226 (QI-SPL-10)

1. Definition:

   Unauthorized and undocumented alignment bead welds.

2. Justification:

   A. Problem:

      The quality indicator identifies that some craft personnel had performed such welds (alignment bead welds) unauthorized and undocumented.

      Corrective action does not address the impact of these unauthorized welds.

   B. Boundary:

      All piping requiring alignment beads.

3. Comments:

   A. Enforcement Item No. 390/79-25-01 identifies the potential problems that welders were in the habit of making alignment bead or draw bead welds without documenting them.

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Date: 4/19/86

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FORM EG&G-460A
(Rev. 05-84)

Date April 18, 1986

A. E. Bradford — From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 227 (QI-SPL-11)

1. Definition:

   Improper fitup and QC acceptance.

2. Justification:

   The quality indicator including Tennessee Valley Authority (TVA) and the Weld Evaluation Project (WEP) investigation was definitive enough to define the problem and the problem boundary. The problem and the problem boundary are within the WEP work scope.

   A. Problem:

      Incomplete corrective action. Assess other areas of plant for similar problems.

   B. Boundary:

      Stiffener and crossbracing welds on surge line truss, Drawing 48W1703-06R2, 05R5, 07R5, 07R3, and 08R2. Disposition not adequate. Inspect stiffener and crossbracing welds to current drawing criteria.

3. Comments:

   Extensive review of PDO's has been completed by WEP and is on file under EC-SPL-9. PDOs have been identified an NCR 3001 and 3325. Extensive reinspection by TVA has been completed. WEP is reviewing the extent of this reinspection and will evaluate TVA's inspection documents for adequacy. Actual field inspection may not be required dependent upon the results of the WEP documentation review.

   WEP review has determined that the welds in question are on crossbeam and are considered in the structural category and not considered a PDO.

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Date April 18, 1986

A. E. Bradford — From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 228 (QI-SPL-20)

1. Definition:

   Incomplete welds in fire protection system.

2. Justification:

   The employee concern identifies potential incomplete welds in the fire protection 6 inch welds to check valves. Using a special group for the 6 inch welds to check valves will give a statistical basis for evaluation of existence of this problem.

   A. Problem:

      Incomplete welds.

   B. Boundary:

      All safety-related 6 inch welds to check valves in the fire protection system.

3. Comments:

   The employee concern was delivered to WEP on April 8, 1986. Due to the date of delivery further information from the concerned individual through QTC for better definition of this problem cannot be obtained.

Approved: A. E. Bradford — Date: 4/19/86

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FORM EG&G-460A (05-84)

Date June 21, 1986

To A. E. Bradford From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. Org. EG&G Weld Evaluation Project

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP 229 (EC-SPL-21)

1. Definition:

   Embedded slag in welds.

2. Justification:

   The employee concern identifies potentially inadequate welds on the Unit 1 steam generator supports due to embedded slag. The formation of a special group will address this problem using an inspection/NDE technique capable to detect subsurface defects which should not be required for general examination of the Civil Structural Group.

   A. Problem:

      Embedded slag in steam generator supports.

   B. Boundary:

      Unit 1 steam generator supports.

3. Comments:

   The employee concern was delivered to WEP on April 8, 1986. Due to the date of delivery further information from the concerned individual through QTC for better definition of this problem cannot be obtained.

   The original employee concern identified the item as steam generator "PDO" support; however, it has been determined that there is no steam generator "PDO" support, therefore it was logically assumed it was referring to the steam generator supports.

Approved: A. E. Bradford Date: 6/26/86

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Date April 18, 1986

A. E. Bradford — From H. Richardson

Org. Employee Concerns/Quality Indicator Assess. — Org. Employee Concerns

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 230 (QI-SPL-12)

1. Definition:

   Missing, incomplete, and bad welds.

2. Justification:

   The Quality Indicator identifies a pipe sleeve hanger support in which the above defined weld problems exist. No further evaluation of similar supports was made to determine if this condition exists at other locations in Unit 1.

   A special group will be formed for similar supports in order to isolate them from the general population and determine if this condition might exist at other locations.

   A. Problem:

      Pipe sleeve hanger support with missing, incomplete, and bad welds.

   B. Boundary:

      All welds on seismic pipe sleeve hanger supports in which the configuration is similar to that shown on Drawing 70-ICC-R487.

3. Comments:

   NCR 4477R identified extensive weld problems on a specific support. This support had previously been accepted with no report of the weld problems. An engineering evaluation for the identified nonconformance gave the resolution accept as is. There was no review of similar supports to determine if a generic problem exists.

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FORM EG&G-460A (05-84)

Date April 18, 1986

To A. E. Bradford From S. McGarvey

Org. Employee Concerns/Quality Indicator Assess. Org. Assessment Plans

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 231 (EC-SPL-22)

1. Definition:

   Improper welding on "box anchors."

2. Justification:

   Twelve (12) employee concerns comprised the group and address the improper welding of box anchors. Their concerns, when evaluated deal with two distinct areas:

   a. Welds required on the back plate of the box anchor when completed extend to the pipe, thus becoming fused to the pressure boundary.

   b. An excessive amount of heat/thermal stress is induced into the pipe due to the type of weld vs. size of pipe, heavy construction pressure to meet schedules, and incorrect procedures used to make the circumferential welds connecting the pipe to the "box hangers."

   WEP engineering is currently performing an evaluation on excessive heat input during the welding process. It has been determined that the primary concern is with sensitization of stainless steel. This sensitization may or may not be detrimental to the integrity of the pipe depending upon wall thickness, design temperatures, and composition of the medium in the pipe.

   Due to the lack of specific information contained in the employee concern, I/E mark number, location, material type, etc. the group would better lend itself to evaluation by sample examination.

   A. Problem:

      Four concerns identified a problem with the end plate weld flowing into the pipe being supported.

      Eight concerns identified a problem with excessive heat input when welding the circumferential weld joining the box anchor to the pipe.

      The potential impact with regard to structural integrity of the anchor and pipe is the "sensitization" of the Heat Affected Zone (HAZ) in stainless pipe.

   B. Boundary:

      All box anchors attaching to stainless steel pipe in Unit 1.

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The sample examination will require a visual inspection of all welds, on box anchors with attention directed toward indication of excessive heat, i.e. distortion, shrinkage, etc.

3. Comments:

The critical problem occurring from excessive heat input is applicable to stainless pipe. Thus the reason for limiting the sample to stainless pipe. However, the anchors may contain stainless and carbon items, for example, carbon tube steel with stainless end plates or the anchor may consist of all carbon, even though it attaches to a stainless pipe. By sampling anchors attaching to stainless pipe the problem of sensitization is addressed and the weld quality of box anchors can also be determined.

TVA has provided a technical justification for acceptance of the problem in which end plate seam weld material flows into the pipe being supported. This technical justification is being evaluated by WEP engineering.

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FORM EG&G-460A
(Rev. 05-84)

Date June 21, 1986

A. E. Bradford — From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. — Org. EG&G Weld Evaluation Project

Address — Address

SUBJECT: JUSTIFICATION FOR FORMATION OF SPECIAL GROUP 232 (EC-SPL-23)

Definition

Pipe support welds questionable.

Justification

The aggregate of seven employee concerns identified weld quality problems with the pipe support welds, i.e., inadequate inspector/craft training, questionable weld quality and inspection practice, and conflicting procedures/drawings.

Problem

Pipe support welds questionable.

Boundary

Unit 1 safety-related pipe support welds.

Approved: A. E. Bradford Date: 6/26/86

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Attachments:
As Stated

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Date June 21, 1986

To A. E. Bradford From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. Org. EG&G Weld Evaluation Project

Address — Address

SUBJECT: JUSTIFICATION FOR FORMATION OF SPECIAL GROUP NO. 233 (EC-SPL-24)

Definition

Pipe welds questionable.

Justification

The aggregate of 50 employee concerns identified weld quality problems in the pipe welds, i.e., questionable weld documentation, questionable welding parameters used, questionable welder qualification and equipment suitability, questionable base material, and questionable weld quality.

Problem

Pipe welds questionable.

Boundary

All Unit 1, safety-related pipe welds.

Approved: A. E. Bradford Date: 6/26/86

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Attachments:
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Date June 21, 1986

To A. E. Bradford From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess. Org. EG&G Weld Evaluation Project

Address — Address

SUBJECT: JUSTIFICATION FOR FORMATION OF SPECIAL GROUP 234 (EC-SPL-25)

Definition

Civil weld questionable.

Justification

Five employee concerns identified weld quality problems with the civil structural welds, i.e., poor workmanship and weld quality, improper repair and welding practices, and craft responsible for fitup and material.

Problem

Civil welds questionable.

ndary

ll Unit 1 safety-related civil welds.

Approved: A. E. Bradford Date: 6/26/86

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Attachments:
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(Rev. 05-84)

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Date June 21, 1986

To A. E. Bradford

From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess.

Org. EG&G Weld Evaluation Project

Address

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SUBJECT: JUSTIFICATION FOR FORMATION OF SPECIAL GROUP 235 (EC-SPL-26)

Definition

Electrical support welds questionable.

Justification

Two employee concerns identified weld quality problems with the electrical supports, i.e., questionable welder qualification and questionable inspector training.

Problem

Electrical support welds questionable.

Boundary

All Unit 1 safety-related electrical support welds.

Approved: A. E. Bradford Date: 6/26/86

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v. 05-84)

Date June 21, 1986

A. E. Bradford

From C. D. Cooper

Org. Employee Concerns/Quality Indicator Assess.

Org. EG&G Weld Evaluation Project

Address

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SUBJECT: JUSTIFICATION FOR FORMATION OF SPECIAL GROUP 236 (EC-SPL-27)

Definition

Structural welds questionable.

Justification

Thirteen employee concerns identified weld quality problems with the structural welds, i.e., AISC/American Welding Society (AWS) weld requirements not met, no documentation for surveillance program, inspection of fitupxxx by Quality Control (QC) deleted, and no weld inspection tools prior to 1979.

Problem

Structural welds questionable.

Boundary

All Unit 1 safety-related structural welds.

Approved: A. E. Bradford Date: 6/26/86

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Attachments:
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FORM EG&G-460A (5-84)

Date May 16, 1986

To A. E. Bradford From J. Mitchell

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicators

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 237 (QI-SPL-13)

1. Definition:

   Skewed fillet welds on seismic pipe supports (non-ASME).

2. Justification:

   NCR 2807 identifies skewed fillet welds on seismic pipe supports that are not in accordance with AWS D1.1 requirements.

   A. Problem:

      Skewed fillet welds specified on pipe support drawings have been constructed with the leg length equal to fillet weld size.

   B. Boundary:

      Non ASME Seismic pipe supports.

3. Comments: None.

Approved: A. E. Bradford /KR Date: 8/1/86

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FORM EG&G-460A
(Rev. 05-84)

NOTEGRAM

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Date August 15, 1986

To A. E. Bradford

From D. Cochran

Org. Employee Concerns/Quality Indicator Assess.

Org. Quality Indicator

Address

Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 238 (QI-SPL-14)

1. Definition:

   All welds inspected with PT.

2. Justification

   NRC Enforcement Item 390/79-25-01 and 390/80-19-01

   A. Problem:

      All welds inspected with PT.

   B. Boundary:

      PT. of all welds prior to 1980.

3. Comments: None.

Approved: A.E. Bradford /KR

Date: 8/16/86

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FORM EG&G-460A (5-84)

Date May 16, 1986

To .. E. Bradford From J. Mitchell

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicators

Address _____ Address _____

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 239 (QI-SPL-15)

1. Definition:

   Questionable acceptability of MT reports due to documentation deficiencies, in ERCW and HPFP systems.

2. Justification:

   NSRS Report I-83-01-WBN.

   A. Problem:

      NDE documentation validity. MT's signed off by absent inspector's. Revisions of M-8 not retained. (Criteria for ASME Documentation.)

   B. Boundary:

      MT reports between January 1977 through December 1978 for personnel Roy Best and H. L. Alsup.

3. Comments: None.

Approved: A. E. Bradford/kr Date: 8/1/86

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(5-84)

Date May 16, 1986

To A. E. Bradford From J. Mitchell

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicators

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 240 (QI-SPL-16)

1. Definition:

   Welds performed requiring external inert purge.

2. Justification:

   NRC Enforcement Items 390-79-41 and 390-78-3.

   A. Problem:

      Welding without purge.

   B. Boundary:

      No boundaries can be established. A general population sample will be performed to assess extent of impact.

3. Comments: None.

Approved: A. E. Bradford /KR Date: 8/1/86

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Date May 16, 1986

To A. E. Bradford From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicators

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 243 (QI-SPL-19)

1. Definition:

   Structural and miscellaneous features not constructed to design drawings.

2. Justification:

   Watts Bar Reportable Deficiency WBRD-50-390/81-75 [50.55(e) item on NCR 3579] identifies a general concern that miscellaneous and structural items did not conform to the design drawings.

   A. Problem:

      Structural and miscellaneous items such as platforms, stairs, and ladders do not conform to design drawings.

   B. Boundary:

      Platforms, stairs, and ladders in the auxiliary, control, and reactor buildings.

3. Comments: None.

Approved: A.E. Bradford/AR Date: 8/1/86

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FORM EG&G-460A
(05-84)

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Date May 16, 1986

To . E. Bradford From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. Org. Quality Indicators

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 244 (QI-SPL-20)

1. Definition:

   Insufficient, lost, incomplete documentation.

2. Justification:

   31 TVA NCRs identify various problems related to documentation, such as insufficient, lost, or incomplete records.

   A. Problem:

      Insufficient, lost, or incomplete quality records.

   B. Boundary:

      No boundaries can be established. A general population sample will be performed to assess extent of impact.

3. Comments: None.

Approved: A. E. Bradford /KK Date: 8/1/86

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(Rev. 05-84)

Date May 16, 1986

To E. Bradford From J. Mitchell

Org. ~~Employee Concerns/Quality Indicator Assess.~~ Org. ~~Quality Indicators~~

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 241 (QI-SPL-17)

1. Definition:

   Structural steel welds previously accepted and later found unacceptable. The quality of welding not in accordance with drawing and specification requirements.

2. Justification:

   NCR 4753 (R1) Main steam valve, NCR 3718 (R1), and NCR 5561.

   A. Problem:

      Inspector's qualifications. Inspections not made in strict adherence to requirements of G-29C

   B. Boundary:

      Main steam valve room, structural steel, drawings 48W1707 and 48W1708.

3. Comments: None.

Approved: A. E. Bradford/HR Date: 8/1/86

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FORM EG&G-460A
(Rev. 05-84)

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Date May 16, 1986

E. Bradford — From D. Cochran

Org. Employee Concerns/Quality Indicator Assess. — Org. Quality Indicators

Address — Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 242 (QI-SPL-18)

1. Definition:

   Inspectors missing inspections and lack of inspector's awareness of acceptance criteria.

2. Justification:

   14 TVA generated NCRs identify inspectors missing inspections and general lack of awareness of acceptance criteria.

   A. Problem:

      Inspectors missing inspections and accepting deficient welds due to being unaware of acceptance criteria.

   B. Boundary:

      No boundaries can be established. A general population sample will be performed to assess extent of impact.

3. Comments: None.

Approved: A.E. Bradford /AE — Date: 8/1/86

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FORM EG&G-460A (7-84)

Date May 16, 1986

To A. E. Bradford From D. Cochran

Org. ~~Employee Concerns/Quality Indicator Assess.~~ Org. ~~Quality Indicators~~

Address Address

SUBJECT: JUSTIFICATION FOR SPECIAL GROUP FORMATION--SPECIAL GROUP NUMBER 245 (QI-SPL-21)

1. Definition:

   Repetitive problem of ANSI lugs being incorrectly installed and incorrectly inspected.

2. Justification:

   NCR 2451R identified shear lugs installed contrary to procedures and drawings and improperly inspected.

   A. Problem:

      Installed lugs exist that are not in accordance with design drawings and were accepted by QC.

   B. Boundary:

      All ANSI lugs.

3. Comments: None.

Approved: A.E. Bradford/HR Date: 8/1/86

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ATTACHMENT 3

WEP 3.1.3
ESTABLISHING HOMOGENEOUS GROUPS AND BOUNDARIES

QUESTION 1

ATTACHMENT 4

MASTER LIST OF

WEP

EMPLOYEE CONCERNS

Date: October 10, 1986

Approved: A.E. Bradford /HK Date: 10/6/86

ORIGINAL

INSTRUCTION

The Master List of WEP Employee Concerns presents, by category and descriptive heading, the problems identified in Employee Concerns and transmitted to the Department of Energy (DOE) Weld Evaluation Project (WEP) for evaluation, and provides an index of all Employee Concerns evaluated by DOE WEP. The document is described in the following paragraphs.

Category/Description

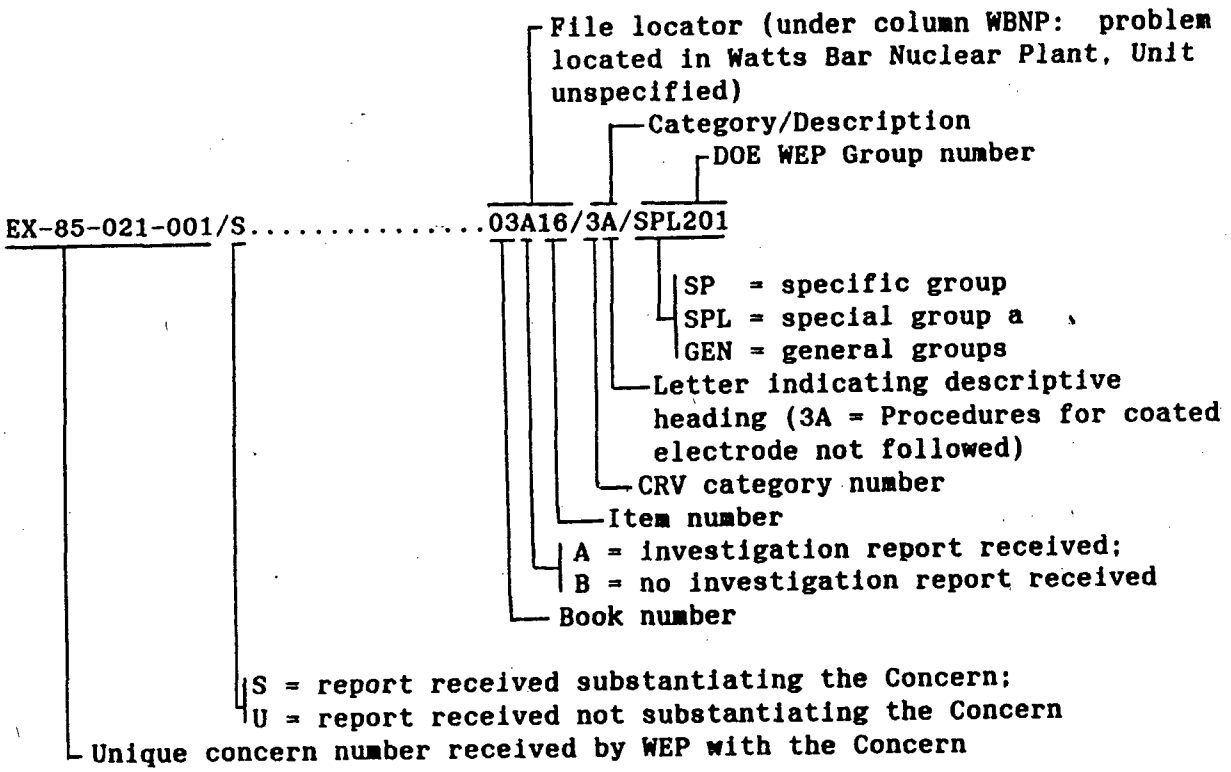
The nine categories, CRV 01-09 (indicating Concern Review Volume number), are divided into subcategories, all of which are logically and naturally derived from the Employee Concerns.

Index

The index lists all employee concerns received by WEP and indicates (by which column the second alphanumeric is placed) the location of the alleged problem and whether WEP has determined the concern to be appropriate for WEP evaluation. The alphanumerics themselves indicate (in the first column) the unique Concern number and whether a report was received that substantiates or failed to substantiate the Concern, and (in the other columns) the file location, category/description, and DOE WEP homogeneous group number with which the Concern is identified.

Figure 1 defines and explains both the alphanumerics and the column headings under which they are placed.

CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A



Concern No.--The unique identifier on the Employee Concern as provided to DOE WEP.

Unit 1 Specified--Indicates that the Employee Concern specifically identifies Unit 1.

WBNP--Indicates that the Employee Concern is concerned with the Watts Bar Nuclear Plant, but the problem cannot be isolated to either Unit 1 or Unit 2.

Unit 2 Specified--Indicates that the Employee Concern specifically identifies Unit 2.

Other Plant Specified--Indicates that the Employee Concern specifies TVA facilities other than Watts Bar Unit 1 or Unit 2.

WEP N/A--Indicates that the Employee Concern was determined to be outside the work scope of DOE WEP.

---

a. Employee Concern will be resolved by the referenced general group evaluation.

Figure 1.

ORIGINAL

CATEGORY/DESCRIPTION

CRV 01 WELDER CERTIFICATIONS
- A. Improper welder recertification
  - A.1 Backdating of welder certification
  - A.2 Nonrigorous verification of requirements for recertification
  - A.3 Requalification test not per code requirements
  - A.4 Welder not qualified for process used
- B. Questionable welder training and experience
- C. Administrative problems associated with recertification
- D. Welder recertification, not WEP applicable

CRV 02 INSPECTOR CERTIFICATION/QUALIFICATION
- A. Visual inspection qualifications do not meet code
- B. Questionable visual inspector experience and training
- C. Inspector qualification, not WEP applicable

CRV 03 WELD FILLER MATERIAL CONTROL
- A. Procedures for coated electrode not followed
- B. Poor quality flux
- C. Inadequate weld filler traceability
- D. Weld filler control, not WEP applicable

CRV 04 PARENT METAL PROBLEMS
- A. Unrepaired arc strikes
- B. Excessive excavation

CRV 05 DOCUMENTATION/FALSIFICATION
- A. Improper alterations
  - A.1 Unauthorized access to computerized weld information system
  - A.2 Alterations using correction fluid
- B. Incorrect or inaccurate documentation
  - B.1 Undocumented temporary welds
  - B.2 Documentation buyoff without inspection
  - B.3 Unspecified documentation inaccuracies
- C. Inadequate document control
  - C.1 Lost or missing documentation
  - C.2 Documentation does not comply with manual
  - C.3 Welds not identified/stencilled
- D. Documentation, not WEP applicable

CRV 06 WORKMANSHIP/SPECIFIC WELD PROBLEMS
- A. Incomplete welds
- B. Welds do not satisfy acceptance criteria
- C. Possible subsurface defects
- D. Unsatisfactory weld appearance
- E. Welding dissimilar metals
- F. Workmanship, not WEP applicable

CRV 07

NDE PROCESS/PROCEDURE

A. Inadequate process control
   - A.1 HVAC ductwork systems not visually inspected
   - A.2 Inspection criteria problems
   - A.3 Inspection through paint
   - A.4 Weld inspection not performed

B. Questionable inspection practice
   - B.1 Surface conditioning for NDE
   - B.2 Fitup performed by craft
   - B.3 Inspection tools not provided

C. Not WEP applicable

CRV 08

WELD PROCESS/PROCEDURE

A. Weld procedures not properly followed
B. Weld procedures not adequate
C. Welding equipment unsuitable
D. Other weld process control problems
E. Improper weld repair
F. Weld process control, WEP not applicable

CRV 09

OTHER WELD QUALITY PROBLEMS

A. Questionable design practice
   - A.1 Questionable box hanger weld joint design
   - A.2 Use of straight butt joint configuration

B. Questionable management practice
   - B.1 Inadequate corrective action follow-up
   - B.2 Creation of busy work
   - B.3 Disposition by engineering analysis
   - B.4 Rework to avoid disciplinary action

C. Questionable construction practices
   - C.1 Use of weld bosses
   - C.2 Sandblasting while welding
   - C.3 Post weld surface conditions

D. Other quality problems, not WEP applicable

CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
BEM-5-001-001				07B62/7.B.2/GEN D,E	
BEM-5-001-002				07B62A/7.B.2/GEN D,E	
BEP-5-001-001		07B74/7.A.4/GEN A-L			
BEP-5-001-003		05B45/5.B.3/GEN A-L			
BFM-5-001-001				07B60/7.B.2/GEN D,E	
BFM-5-001-002				07B60A/7.B.2/GEN D,E	
EX-85-003-003/S		05A08/5.A.1/SPL 233			
EX-85-003-X04		05B47/5.A.1/SPL 233			
EX-85-003-X06/S		05A13/5.A.1/SPL 233			
EX-85-007-002		02B17/2.B/GEN A-L			
EX-85-007-004					07B27
EX-85-008-001/S		01A36/1.A.4/GEN A-L			
EX-85-008-002					09B80
EX-85-009-001/S					09A07
EX-85-010-002/S					09A05
EX-85-012-001/S					09A09
EX-85-020-001	06B78/6.B/SPL 228				
EX-85-021-001/S		03A16/3.A/SPL 201			
EX-85-021-002/S		01A09/1.A.2/SPL 216			
EX-85-030-001		08B53/8.D/GEN A-L			
EX-85-037-002	01B45/1.A.4/SPL 232				
EX-85-037-003	06B29/6.D/SPL 233				
EX-85-037-004		02B12/2.B/GEN A-L			
EX-85-039-001/S		03A26/3.A/SPL 201			
EX-85-039-003/S		09A02/9.A.1/SPL 231			
EX-85-042-002/S		01A46/1.C/GEN A-L			
EX-85-042-003/S		01A33/1.C/GEN A-L			
EX-85-042-004/S		01A50/1.A.2/GEN A-L			
EX-85-042-005/S		01A52/1.A.2/GEN A-L			
EX-85-048-004		01B27/1.A.4/SPL 233			
EX-85-059-001		09B73/9.C.3/GEN A-L			
EX-85-061-003/S		03A25/3.A/SPL 201			
EX-85-061-004		08B31/8.C/GEN A-L			
EX-85-061-005					09B117
EX-85-076-001		06B43/6.B/SPL 246			
EX-85-076-002			06B03/6.B/GEN I,J		
EX-85-082-001		02B36/2.B/GEN A-L			
EX-85-093-001/S		02A02/2.B/GEN A-L			
EX-85-096-002					01B78
EX-85-107-001		01B74/1.C/GEN A-L			
EX-85-107-002					09B105
EX-85-127-003		08B50/8.C/GEN A-L			

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CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
EX-85-154-001			06B46/6.A/GEN I,J		
EX-85-169-002		02B18/2.B/GEN A-L			
HI-85-008-001					09B92
HI-85-019-001					09B106
HI-85-040-001/S		05A03/5.A.1/SPL 233			
HI-85-042-001					09B34
HI-85-046-001					09B29
HI-85-049-001	06B47/6.C/SP 10				
HI-85-064-001					09B93
HI-85-080-001		01B80/1.B/GEN A-L			
HI-85-114-001					09B107
IN-85-001-001		07B09/7.A.2/GEN A-L			
IN-85-001-002/U		03A01/3.A/SPL 201			
IN-85-001-003/S					08A01
IN-85-001-004/S		02A17/2.B/GEN A-L			
IN-85-001-005/S					06A09
IN-85-001-006		07B45/7.B.2/GEN A-L			
IN-85-001-008/S		02A03/2.B/GEN A-L			
IN-85-004-001		08B49/8.C/GEN A-L			
IN-85-004-002					09B108
IN-85-007-001		07B08/7.B.3/GEN A-L			
IN-85-007-002		02B40/2.B/GEN A-L			
IN-85-007-003/S					06A10
IN-85-021-003/S		01A20/1.A.1/GEN A-L			
IN-85-021-X05/S		01A25/1.A.1/GEN A-L			
IN-85-022-001		07B73/7.A.4/GEN F			
IN-85-025-001					09B120
IN-85-026-001/S		07A13/7.B.2/SPL 234			
IN-85-029-001					09B94
IN-85-041-001/S		02A09/2.B/GEN A-L			
IN-85-050-001		08B40/8.C/SPL 236			
IN-85-050-002			08B30/8.C/GEN D-L		
IN-85-050-003					08B48
IN-85-052-002					09B50
IN-85-052-005		01B75/1.C/GEN A-L			
IN-85-052-006/S		07A10/7.B.2/SPL 236			
IN-85-052-007/S		07A12/7.B.2/SPL 236			
IN-85-052-008/S		03A02/3.A/SPL 201			
IN-85-055-003		01B20/1.A.4/SPL 202			
IN-85-062-002			07B28/7.A.4/GEN I,J		

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CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-079-001		02B14/2.B/GEN A-L			
IN-85-079-003					08B26
IN-85-080-001	04B02/4.A/SP 7				
IN-85-085-001	06B05/6.B/SP 33				
IN-85-085-002	06B05A/6.B/SP 33				
IN-85-089-001/S		02A16/2.B/GEN A-L			
IN-85-089-003		01B50/1.A.4/SPL 210			
IN-85-089-004			06B45/6.B/GEN A-C		
IN-85-109-002/S		09B04/9.B.3/GEN A-L			
IN-85-109-003		07B37/7.A.2/SPL 236			
IN-85-113-001		01B61/1.B/GEN A-L			
IN-85-113-003/S		01A35/1.A.2/GEN A-L			
IN-85-127-001					06B36
IN-85-128-001					01B34
IN-85-130-001/S					09A10
IN-85-134-001/U		06A08/6.B/GEN A-L			
IN-85-134-002		07B07/7.B.3/GEN A-L			
IN-85-134-005		09B01/9.B.3/GEN A-L			
IN-85-137-001	07B20/7.A.2/SP 35				
IN-85-143-001	08B42/8.B/SPL 208				
IN-85-143-002	08B42A/8.B/SPL 208				
IN-85-149-002			09B65/9.C.3/GEN A-L		
IN-85-150-001					01B01
IN-85-155-001		06B02/6.D/SPL 233			
IN-85-156-001			06B30/6.B/GEN D,E		
IN-85-156-002			07B43/7.A.2/GEN D,E		
IN-85-167-001					09B81
IN-85-178-003		01B76/1.B/GEN A-L			
IN-85-185-001		08B47/8.A/SPL 215			
IN-85-192-002	09B69/9.C.3/GEN A-L				
IN-85-195-001					09B116
IN-85-198-001					09B23
IN-85-202-001/S	06A02/6.C/GEN D,E				
IN-85-203-003		04B01/4.A/GEN A-L			
IN-85-209-002		02B43/2.B/GEN A-L			
IN-85-212-001/S			07A26/7.B.2/GEN K,L		
IN-85-216-001/S		08A02/8.E/GEN D,E			
IN-85-225-001		01B02/1.B/SPL 235			
IN-85-234-001/S		03A05/3.A/SPL 201			
IN-85-246-001					06B76
IN-85-246-002/S	04A03/4.B/SP 9				

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CONCERN N	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-246-005/S					06A01
IN-85-247-001/S			03A36/3.8/GEN A-L		
IN-85-247-002		08B01/8.C/SPL 233			
IN-85-260-001/S		05A21/5.B.2/SPL 233			
IN-85-260-002/S		05A22/5.B.2/SPL 233			
IN-85-260-003/U				05A06	
IN-85-260-004					05B40
IN-85-260-006		07B57/7.A.4/GEN A-L			
IN-85-260-X05/S		05A23/5.B.2/SPL 233			
IN-85-270-001/S	04A04/4.B/SP 9				
IN-85-271-001/U			07A06/7.B.1/GEN A-L		
IN-85-272-003			07B31/7.A.2/GEN A-C		
IN-85-273-001	09B67/9.C.3/GEN A-L				
IN-85-280-001		08B07/8.C/SPL 233			
IN-85-282-002/U		07A05/7.B.1/SPL 233			
IN-85-283-003			01B03/1.C/GEN A-L		
IN-85-284-001		03A27/3.B/GEN A-L			
IN-85-289-004					09B11
IN-85-295-001					09B100
IN-85-295-002					09B52
IN-85-297-003					09B109
IN-85-297-004		01B67/1.A.4/SPL 234			
IN-85-297-006					09B55
IN-85-298-001					05B25
IN-85-298-002		08B06/8.C/SPL 233			
IN-85-299-001		08B05/8.C/GEN A-L			
IN-85-299-002/S		03A29/3.B/GEN A-L			
IN-85-299-003		09B03/9.C.3/SP 6			
IN-85-300-X04		01B81/1.C/GEN A-L			
IN-85-301-001					09B113
IN-85-303-001		08B04/8.C/SPL 233			
IN-85-310-004		07B39/7.A.2/SPL 233			
IN-85-310-005		03B02/3.A/SPL 201			
IN-85-310-006/S		01A48/1.A.2/GEN A-L			
IN-85-316-005			09B38/9.A.1/SPL 231		
IN-85-316-007			01B68/1.A.4/GEN F		
IN-85-317-001/S		03A31/3.B/GEN A-L			
IN-85-317-002			08B28/8.C/GEN A-L		
IN-85-317-004			08B41/8.D/GEN A-C		
IN-85-321-001		09B63/9.B.3/GEN A-L			

CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-325-004					09B12
IN-85-335-002/S		01A45/1.A.1/GEN A-L			
IN-85-337-002/S		03A04/3.A/SPL 201			
IN-85-338-001		08B34/8.D/GEN A-L			
IN-85-339-005			09B71/9.B.3/GEN A-L		
IN-85-339-X06					05B38
IN-85-346-003/S		01A05/1.A.2/GEN A-L			
IN-85-349-001			06B27/6.A/GEN F-L		
IN-85-349-002			07B38/7.A.2/GEN D-L		
IN-85-349-005		06B32/6.A/SPL 233			
IN-85-352-001/S		01A14/1.A.2/GEN A-L			
IN-85-352-002/S		03A06/3.A/SPL 201			
IN-85-358-001					07B65
IN-85-362-002					09B104
IN-85-365-003		02B11/2.B/GEN A-L			
IN-85-372-001					09B101
IN-85-377-001					09B110
IN-85-380-003			06B06/6.B/GEN D,E		
IN-85-396-001					09B20
IN-85-404-001			08B25/8.E/GEN A-C		
IN-85-405-001		09B16/9.A.1/SPL 231			
IN-85-406-001/S		05A01/5.A.1/SPL 233			
IN-85-406-002				07B05/7.A.2/GEN A-L	
IN-85-406-003		07B04/7.B.3/SPL 236			
IN-85-411-002/S		03A33/3.B/GEN A-L			
IN-85-413-002			06B70/6.A/GEN A-L		
IN-85-414-001		02B49/2.B/GEN A-L			
IN-85-424-001/S		03A11/3.A/SPL 201			
IN-85-424-002		09B17/9.B.3/GEN A-L			
IN-85-424-004/S		039A19/3.C/GEN A-L			
IN-85-424-005/S		01A61/1.C/GEN A-L			
IN-85-424-006/S		03A09/3.C/GEN A-L			
IN-85-424-007/S		03A13/3.A/SPL 201			
IN-85-424-009			09B30/9.B.1/GEN A-L		
IN-85-424-010			09B30A/9.B.1/GEN A-L		
IN-85-424-011/S		01A15/1.A.2/GEN A-L			
IN-85-424-014					01B37
IN-85-424-X13/S		01A29/1.A.1/GEN A-L			
IN-85-426-001/S		03A10/3.A/SPL 201			
IN-85-426-002/S		01A11/1.A.2/GEN A-L			

CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-435-001			08B03/8.C/GEN A-L		
IN-85-435-002		09B32/9.B.1/GEN A-L			
IN-85-435-003		09B27/9.B.4/SPL 233			
IN-85-435-005		08B02/8.C/GEN A-L			
IN-85-441-001					09B123
IN-85-441-002		07B48/7.B.1/GEN A-L			
IN-85-441-003/S		03A18/3.A/SPL 201			
IN-85-442-003		02B47/2.B/GEN A-L			
IN-85-442-004		02B09/2.B/GEN A-L			
IN-85-442-008		09B31/9.B.3/SP 11			
IN-85-445-001					01B35
IN-85-445-002/S		05A02/5.A.1/SPL 233			
IN-85-445-010/S		02A01/2.A/GEN A-L			
IN-85-445-X16/S		05A02A/5.A.1/SPL 233			
IN-85-446-001/S		05A11/5.A.1/SPL 233			
IN-85-450-001/s		03A34/3.B/GEN A-L			
IN-85-451-001	09B66/9.C.3/GEN A-L				
IN-85-453-006			08B08/8.C/GEN A-L		
IN-85-453-007/S		01A19/1.A.2/GEN A-L			
IN-85-453-009/S		03A15/3.A/SPL 201			
IN-85-454-001/S		02A10/2.B/GEN A-L			
IN-85-454-002					09B74
IN-85-454-004/S		03A08/3.A/SPL 201			
IN-85-455-001/S		03A37/3.B/GEN A-L			
IN-85-458-001/S		07A18/7.A.3/SPL 205			
IN-85-458-002/S		02A18/2.A/GEN A-L			
IN-85-458-007/S		05A04/5.A.1/SPL 233			
IN-85-460-003/S	04A02/4.A/SPL 233				
IN-85-460-X04	04B03/4.A/SP 8				
IN-85-460-X05/S	04A01/4.B/SP 9				
IN-85-469-003		08B33/8.B/SPL 233			
IN-85-475-001					09B51
IN-85-476-003/S		07A24/7.A.4/SPL 205			
IN-85-476-004/S		02A11/2.B/GEN A-L			
IN-85-480-004/S		01A51/1.A.2/GEN A-L			
IN-85-480-007					09B95
IN-85-486-001			08B09/8.C/GEN A-L		
IN-85-488-001		07B46/7.B.2/SPL 236			
IN-85-493-004/S		01A04/1.A.2/GEN A-L			
IN-85-501-001/S			03A03/GEN A-L		
IN-85-503-001/S					01A01

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CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-510-001/S		02A19/2.A/GEN A-L			
IN-85-511-002		09B68/9.C.3/GEN A-L			
IN-85-513-001/S		02A04/2.B/GEN A-L			
IN-85-515-002			06B26/6.D/GEN F-L		
IN-85-520-002/S		03A38/3.B/GEN A-L			
IN-85-524-001/S		03A35/3.B/GEN A-L			
IN-85-524-002			06B01/6.A/GEN F-L		
IN-85-529-005/S		02A12/2.B/GEN A-L			
IN-85-530-001/S			06A03/6.B/GEN D,E		
IN-85-532-001					07B52
IN-85-532-004/S		01A06/1.C/GEN A-L			
IN-85-532-005/S		01A07/1.A.2/GEN A-L			
IN-85-532-006/S		07A04/7.A.2/SPL 232			
IN-85-533-009/S		01A41/1.A.2/GEN A-L			
IN-85-533-X11/U		01A58/1.A.2/GEN A-L			
IN-85-538-001					09B82
IN-85-540-001/S		01A10/1.A.2/GEN A-L			
IN-85-540-002		03B26/3.B/GEN A-L			
IN-85-541-001/U			06A06/6.A/GEN F-L		
IN-85-543-002/S		01A08/1.A.2/GEN A-L			
IN-85-544-001		08B51/8.A/GEN A-L			
IN-85-544-002		08B52/8.A/GEN A-L			
IN-85-545-005		07B30/7.A.2/GEN A-L			
IN-85-545-X09/U		07A23/7.A.2/GEN A-L			
IN-85-556-001/S		01A37/1.A.4/SPL 233			
IN-85-559-002					06B17
IN-85-561-X05		09B90/9.C.3/GEN A-L			
IN-85-563-007/S		02A20/2.A/GEN A-L			
IN-85-568-001		01B77/1.B/GEN A-L			
IN-85-576-001/S		05A12/5.A.1/SPL 233			
IN-85-579-001/S	06A07/6.A/SPL 233				
IN-85-579-004					09B11
IN-85-579-005	07B51/7.B.1/SPL 212				
IN-85-584-001/S		07A09/7.B.2/SPL 236			
IN-85-584-002/S					07B32
IN-85-585-001					09B79
IN-85-589-002/S		01A38/1.A.4/GEN A-L			
IN-85-593-001		06B73/6.B/GEN A-L			
IN-85-598-001					09B78
IN-85-600-001/S		03A30/3.B/GEN A-L			
IN-85-600-002			08B10/8.C/GEN A-L		
IN-85-600-004	09B05/9.C.2/GEN A-L				

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CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-600-006/S		01A47/1.A.2/GEN A-L			
IN-85-612-002			08B11/8.C/GEN A-L		
IN-85-612-006/S		01A03/1.A.2/GEN A-L			
IN-85-612-X07/S		01A30/1.A.1/GEN A-L			
IN-85-613-001		09B13/9.A.1/SPL 231			
IN-85-617-001					09B114
IN-85-627-036/S		01A49/1.A.1/SPL 233			
IN-85-627-037/S		01A53/1.A.1/SPL 233			
IN-85-629-001			09B22/9.B.2/GEN F-L		
IN-85-632-001	06B10/6.C/SPL 233				
IN-85-634-001		09B14/9.A.1/SPL 231			
IN-85-634-002		08B32/8.B/SPL 231			
IN-85-636-001/S		03A39/3.B/GEN A-L			
IN-85-641-002		06B51/6.B/SP 14			
IN-85-641-003					09B25
IN-85-641-005		08B21/8.A/SPL 207			
IN-85-643-002			07B10/7.B.1/GEN D-L		
IN-85-657-001					06B35
IN-85-658-002	08B17/8.B/SP 35				
IN-85-670-001			06B60/6.B/GEN F-L		
IN-85-670-005		07B53/7.A.2/GEN A-L			
IN-85-671-001/S		07A11/7.B.2/SPL 236			
IN-85-671-003		08B24/8.A/SPL 214			
IN-85-671-004/U					07A01
IN-85-672-001		09B15/9.A.1/SPL 231			
IN-85-672-003					01B23
IN-85-681-002					08B12
IN-85-682-001			07B72/7.A.4/GEN F-L		
IN-85-682-002		07B59/7.A.2/SPL 232			
IN-85-682-003		07B55/7.A.2/GEN A-L			
IN-85-682-008		02B45/2.B/GEN A-L			
IN-85-682-X07		05B44/5.B.3/GEN A-L			
IN-85-686-001			01B06/1.A.4/GEN A-L		
IN-85-705-001/S					09A08
IN-85-706-001		01B07/1.B/GEN A-L			
IN-85-706-002/S		02A05/2.B/SPL 235			
IN-85-706-003					07B67
IN-85-706-005					09B102
IN-85-707-001			06B08/6.D/GEN F-L		
IN-85-707-003		01B08/1.B/SPL 232			
IN-85-725-011/S		03A24/3.A/SPL 201			

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CONCERN	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-725-X14/U		01A34/1.C/GEN A-L			
IN-85-725-X15/U		01A34A/1.C/GEN A-L			
IN-85-725-X16		01B09/1.C/GEN A-L			
IN-85-730-001			07B36/7.B.2/GEN D,E		
IN-85-730-002			07B69/7.A.4/GEN D,E		
IN-85-730-003			07B69A/7.B.2/GEN D,E		
IN-85-731-001					09B112
IN-85-738-004					01B10
IN-85-738-008		01B11/1.C/GEN A-L			
IN-85-740-008					01B69
IN-85-740-009		01B32/1.A.1/GEN A-L			
IN-85-767-003/S		07A19/7.A.3/SPL 205			
IN-85-768-X06/S		03A20/3.A/SPL 201			
IN-85-768-X07/S		05A18/5.B.3/GEN A-L			
IN-85-770-002/S		01A21/1.A.1/SPL 210			
IN-85-770-003/S		01A16/1.A.1/SPL 210			
IN-85-770-X07/S		01A31/1.A.1/SPL 210			
IN-85-778-001/S		01A02/1.A.2/GEN A-L			
IN-85-778-X07/S		01A23/1.A.1/GEN A-L			
IN-85-788-002		02B42/2.B/GEN A-L			
IN-85-793-003			06B71/6.B/GEN A-C		
IN-85-815-001/S		01A12/1.A.2/GEN A-L			
IN-85-828-001			06B11/6.B/GEN I,J		
IN-85-834-002			08B15/8.A/SPL 215		
IN-85-835-002/S		01A13/1.A.2/GEN A-L			
IN-85-845-001					09B26
IN-85-845-004/U	06A04/6.E/SPL 233				
IN-85-846-001					06B12
IN-85-851-001/S	06A11/6.B/SP 10				
IN-85-852-001/U					06A13
IN-85-852-002			07B11/7.A.2/GEN A-C		
IN-85-852-003					01B47
IN-85-866-002					09B58
IN-85-868-001					09B56
IN-85-868-002	06B68/6.D/SPL 247				
IN-85-868-003					09B121
IN-85-880-001	08B13/8.C/GEN A-L				
IN-85-887-001/S		05A20/5.C.1/SPL 246			
IN-85-887-003		05B26/5.C.1/SPL 236			
IN-85-890-001/S		05A10/5.A.1/SPL 233			

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CONCERN	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-85-894-003		08B29/8.D/GEN A-L			
IN-85-923-002	01B42/1.A.4/SPL 233				
IN-85-937-001		09B126/9.B.3/GEN A-L			
IN-85-940-X02		01B66/1.A.4/GEN A-L			
IN-85-940-X03					09B103
IN-85-940-X04		01B63/1.C/GEN A-L			
IN-85-946-001			07B71/7.B.2/GEN D,E		
IN-85-947-003					09B122
IN-85-947-005		03B41/3.A/SPL 201			
IN-85-947-X08		01B12/1.B/SPL 233			
IN-85-960-001					06B33
IN-85-965-001/S		01A22/1.A.1/SPL 210			
IN-85-965-002		01B13/1.A.1/SPL 210			
IN-85-981-001/S		02A13/2.B/GEN A-L			
IN-85-981-002		05B01/5.C.1/GEN A-L			
IN-85-982-003		08B35/8.D/SPL 233			
IN-85-996-002			06B63/6.B/GEN A-C		
IN-86-003-001					09B72
IN-86-017-001			06B40/6.B/GEN A-L		
IN-86-019-001	07B14/7.A.3/SPL 205				
IN-86-019-003	06B24/6.D/SPL 246				
IN-86-032-001/S	06A17/6.C/SP 3				
IN-86-032-002/S	06A16/6.C/SPL 214				
IN-86-037-001	05B31/5.C.1/GEN D-L				
IN-86-039-001		03B45/3.A/SPL 201			
IN-86-046-003	08B23/8.B/SPL 233				
IN-86-047-001		03B08/3.A/SPL 201			
IN-86-047-002			06B14/6.D/GEN A-C		
IN-86-085-003	09B09/9.C.1/SPL 233				
IN-86-086-001		08B18/8.E/GEN D,E			
IN-86-086-002					08B19
IN-86-088-001		02B48/2.B/GEN A-L			
IN-86-093-001	06B48/6.B/SP 2				
IN-86-112-002					08B36
IN-86-122-X02/U		01A43/1.A.4/GEN A-L			
IN-86-131-001					06B16
IN-86-131-002					06B16A

CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-86-131-004			06B69/6.A/GEN A-C		
IN-86-131-005			06B18/6.A/GEN A-C		
IN-86-133-001/S	04A05/4.B/SP 9				
IN-86-140-002					09B28
IN-86-142-001		02B37/2.B/GEN A-L			
IN-86-143-002/S		01A26/1.A.1/GEN A-L			
IN-86-150-001/S		03A12/3.C/GEN A-L			
IN-86-155-002/U			06A05/6.B/GEN F-L		
IN-86-155-003		05B18/5.C.1/SP 5			
IN-86-155-004/U					05A07
IN-86-158-006		01B14/1.A.2/GEN A-L			
IN-86-158-007/S					09A12
IN-86-158-008		06B21/6.C/GEN A-L			
IN-86-167-001/S		03A07/3.C/GEN A-L			
IN-86-167-002		05B19/5.C.3/GEN A-L			
IN-86-167-003/S		03A28/3.B/GEN A-L			
IN-86-167-004/U		01A60/1.C/GEN A-L			
IN-86-167-005/S		01A27/1.A.1/GEN A-L			
IN-86-167-X06/S		01A28/1.A.1/GEN A-L			
IN-86-168-002/S		02A06/2.B/GEN A-L			
IN-86-168-003			05B24/5.C.3/GEN A-L		
IN-86-168-006			05B17/5.B.3/GEN A-L		
IN-86-184-001	06B80/6.C/SPL 229				
IN-86-184-002/S	08A05/8.D/SPL 233				
IN-86-184-003	07B25/7.A.2/SPL 229				
IN-86-184-004/S	08A04/8.D/SPL 233				
IN-86-190-002		01B33/1.B/SPL 211			
IN-86-205-007		01B41/1.A.2/GEN A-L			
IN-86-205-009		07B64/7.A.2/GEN A-C			
IN-86-211-001		05B20/5.C.3/GEN A-L			
IN-86-219-001					09B115
IN-86-230-003		09B37/9.B.3/GEN A-L			
IN-86-246-005					06B74
IN-86-249-X02/S		08A07/8.D/SPL 233			
IN-86-281-001		09B02/9.B.1/GEN A-L			
IN-86-282-004					09B77
IN-86-294-002					09B33
IN-86-297-001	06B15/6.C/SP 1				
IN-86-300-004		09B125/9.C.3/GEN A-L			
IN-86-301-001	06B25/6.D/SPL 206				

ORIGINAL

CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
IN-86-301-002/S		01A42/1.A.3/GEN A-L			
IN-86-303-003		01B58/1.B/GEN A-L			
IN-86-303-004		01B57/1.C/GEN A-L			
IN-86-304-001/S		02A21/2.B/GEN A-L			
IN-86-305-003		01B59/1.B/GEN A-L			
IN-86-305-004/S		03A23/3.A/SPL 201			
IN-86-315-006		09B44/9.B.3/GEN A-L			
NS-85-001-001/S		07A22/7.A.3/SPL 205			
NS-85-001-X03/S		07A30/7.A.2/GEN A-L			
OW-85-003-001		09B36/9.A.1/SPL 231			
OW-85-003-002		08B14/8.C/GEN A-L			
PH-85-001-005/S					09A12
PH-85-002-019					09B96
PH-85-002-029					01B36
PH-85-002-030		01B17/1.B/GEN A-L			
PH-85-003-011		06B28/6.D/GEN A-L			
PH-85-003-020		01B46/1.B/GEN A-L			
PH-85-005-001/S					09A06
PH-85-008-001		05B46/5.B.3/GEN A-L			
PH-85-009-001					09B21
PH-85-012-001/S		07A02/7.A.1/SP 35			
PH-85-012-X03/S		07A29/7.A.1/SP 35			
PH-85-013-001/S		03A32/3.B/GEN A-L			
PH-85-016-001/S		02A14/2.B/GEN A-L			
PH-85-027-001/S	06A14/6.B/SP 12				
PH-85-027-002/S	08A09/8.E/SP 12				
PH-85-027-004/S	06A15/6.C/SP 12				
PH-85-027-005/S	07A31/7.A.4/SP 12				
PH-85-027-006	06B23/6.B/SP 12				
PH-85-027-007	08B37/8.A/SP 12				
PH-85-027-X08		05B04/5.B.2/GEN A-L			
PH-85-032-001		06B67/6.D/SPL 247			
PH-85-035-002	06B79/6.B/SP 34				
PH-85-035-003		08B27/8.A/SPL 204			
PH-85-040-001/S	07A20/7.A.3/SPL 205				
PH-85-051-001			07B24/7.A.2/GEN A-C		
PH-85-052-002/S		01A44/1.A.1/GEN A-L			
PH-85-052-X03/U		01A59/1.A.1/GEN A-L			
SQM-5-001-001/U				07A15/7.B.2/GEN D,E	
SQM-5-001-002/U				07A16/7.B.2/GEN C	
SQM-6-005-001/S				01A54/1.C/GEN A-L	

ORIGINAL

CONCERN	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
SQM-6-005-X02/S					
SQM-6-008-001				01A55/1.A.1/GEN A-L	
WBM-5-001-001				06B75/6.B/GEN A-C	
WBM-5-001-002		07B63/7.B.2/SPL 234			
WBM-6-002-001				07B75/7.B.2/GEN A-L	
		09B91/9.C.3/GEN A-L			
WBM-6-004-X08					
WBP-6-004-X01					05B39
WBP-6-007-001		02B26/2.B/GEN A-L			
WBP-6-022-016		09B35/9.A.1/SPL 231			
WBP-6-022-026		01B70/1.A.1/GEN A-L			
		01B71/1.A.2/GEN A-L			
WBP-6-022-X28					
WI-85-002-001		01B73/1.A.1/GEN A-L			
WI-85-003-001/S		03B23/3.A/SPL 201			
WI-85-003-X02/S		01A32/1.A.1/GEN A-L			
WI-85-013-001/S		01A24/1.A.1/GEN A-L			
		02A26/2.A/SPL 247			
WI-85-013-002					
WI-85-013-003/S	07A14/7.A.3/SPL 205	07B54/7.B.2/SPL 236			
WI-85-025-001/S		05A14/5.A.1/SPL 233			
WI-85-026-005		03B44/3.C/GEN A-L			
WI-85-029-002/S		07A17/7.A.4/SPL 248			
WI-85-030-001				09B06/9.B.1/GEN A-L	
WI-85-030-002/S		02A07/2.A/GEN A-L			
WI-85-030-003		07B66/7.A.2/GEN A-L			
WI-85-030-004/S		09A14/9.B.3/SPL 246			
WI-85-030-005		08B20/8.D/GEN A-L			
WI-85-030-006		09B18/9.B.1/SPL 233			
WI-85-030-007					
WI-85-030-008		07B19/7.A.3/SPL 205			
WI-85-030-009		07B01/7.A.3/SPL 205			
WI-85-030-010		07B02/7.A.3/SPL 205			
WI-85-035-001	07B23/7.B.2/SPL 234			09B06A/9.B.1/GEN A-L	
WI-85-035-002	05B21/5.B.2/SPL 233				
WI-85-035-004		06B42/6.C/SP 4			
WI-85-035-007/U	01A57/1.A.4/SPL 233				
WI-85-041-001/S		03A14/3.C/GEN A-L			
WI-85-041-002/S		02A15/2.A/SPL 232			
WI-85-041-003/S		05A19/5.C.1/SPL 246			
WI-85-041-004		05B08/5.C.1/SPL 205			
WI-85-041-006/S		07A25/7.A.3/SPL 205			
WI-85-041-007		07B56/7.A.3/SPL 205			
WI-85-041-008/S		07A21/7.A.3/SPL 205			

CONCERN	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
WI-85-041-009/S		03A21/3.A/SPL 201			
WI-85-041-010		07B16/7.A.3/SPL 205			
WI-85-041-012/S		03A22/3.C/GEN A-L			
WI-85-041-013		07B58/7.B.2/SPL 236			
WI-85-042-001					09B97
WI-85-046-002/S		02A08/2.B/GEN A-L			
WI-85-046-003		02B35/2.A/GEN A-L			
WI-85-046-014/S		02A22/2.B/GEN A-L			
WI-85-046-X18		02B24/2.A/GEN A-L			
WI-85-050-001	06B19/6.C/SP 13				
WI-85-053-001					09B124
WI-85-053-002		05B02/5.C.2/GEN A-L			
WI-85-053-003/S		05A05/5.B.1/SPL 209			
WI-85-053-004/S		03B21/3.A/SPL 201			
WI-85-053-012					09B24
WI-85-055-001/S		01A17/1.A.3/GEN A-L			
WI-85-056-001/S		01A18/1.A.3/GEN A-L			
WI-85-064-001		05B27/5.B.3/SPL 233			
WI-85-064-002		08B45/8.A/SPL 207			
WI-85-064-003		09B70/9.C.3/GEN A-L			
WI-85-064-005		06B31/6.B/SPL 203			
WI-85-064-006		05B13/5.A.1/SPL 233			
WI-85-064-X04		05B30/5.B.3/GEN A-L			
WI-85-076-001		05B06/5.B.3/GEN A-L			
WI-85-076-002		05B05/5.B.2/GEN A-L			
WI-85-081-002		05B35/5.B.3/SPL 233			
WI-85-081-003		08B44/8.A/SPL 207			
WI-85-081-004		06B50/6.B/SPL 213			
WI-85-081-005		06B64/6.B/SPL 233			
WI-85-081-007/S		02A23/2.B/GEN A-L			
WI-85-081-010		02B32/2.B/GEN A-L			
WI-85-081-X06		05B32/5.B.3/GEN A-L			
WI-85-084-001/S		08A03/8.D/GEN A-L			
WI-85-085-003					09B98
WI-85-091-007		05B42/5.C.1/GEN A-L			

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CONCERN	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
WI-85-097-001/U			05A15/5.B.3/GEN A-L		
WI-85-097-002/U			05A16/5.B.3/GEN A-L		
XX-85-010-001/U					09A11
XX-85-013-001				03A17/3.C/GEN A-L	
XX-85-034-001				07B70/7.A.4/GEN A-L	
XX-85-034-X02				05B03/5.B.3/GEN A-L	
XX-85-041-001/U				08A08/8.A/GEN A-L	
XX-85-045-001				01B24/1.B/GEN I,J	
XX-85-049-001/S				01A39/1.A.1/GEN A-L	
XX-85-049-X03/S				01A40/1.A.1/GEN A-L	
XX-85-054-001/U				07A07/7.A.4/GEN A-L	
XX-85-065-001/U					07A08
XX-85-065-002					09B99
XX-85-068-003				03B42/3.A/GEN A-L	
XX-85-068-005				05B28/5.B.3/GEN A-L	
XX-85-068-006				03B38/3.A/GEN A-L	
XX-85-068-007/U					06A12
XX-85-068-008				09B42/9.B.1/GEN A-L	
XX-85-069-001/S				01A62/1.B/GEN A-L	
XX-85-069-001-R1					02B38
XX-85-069-003/S					02A25
XX-85-069-003-R1/U				02A24/2.B/GEN A-L	
XX-85-069-X05		02B34/2.A/GEN A-L			
XX-85-069-X13/S					01A63
XX-85-082-001					05B41
XX-85-082-002					05B43
XX-85-083-001/U				07A03/7.A.2/GEN A-L	
XX-85-086-002					09B08
XX-85-086-003/S					09A01
XX-85-086-004					09B08B
XX-85-088-001				05B22/5.A.2/GEN A-L	
XX-85-088-003/U				05A17/5.A.2/GEN A-L	
XX-85-088-X05/S				01A56/1.A.1/GEN A-L	
XX-85-098-001				06B72/6.B/GEN A-C	
XX-85-100-001/U				08A06/8.E/GEN A-L	
XX-85-101-005					09B83
XX-85-101-006				01B65/1.A.4/GEN A-L	
XX-85-102-004				09B43/9.B.3/GEN A-L	
XX-85-102-006				07B12/7.A.2/GEN A-L	
XX-85-102-011/U					09A03

CONCERN NO.	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
XX-85-107-001				02B27/2.B/GEN A-L	
XX-85-108-001/U				07A27/7.A.4/GEN A-L	
XX-85-108-002/U				07A28/7.A.4/GEN A-L	
XX-85-110-001				09B40/9.B.1/GEN A-L	
XX-85-124-001				03B43/3.B/GEN A-L	

CONCERNS	UNIT 1 SPECIFIED	WBNP	UNIT 2 SPECIFIED	OTHER PLANT SPECIFIED	WEP N/A
TOTAL: 606	TOTAL: 57	TOTAL: 328	TOTAL: 60	TOTAL: 41	TOTAL: 120

ORIGINAL

QUESTION 2

ATTACHMENT 1

RESPONSE TO NRC QUESTION 2

The figures included in this response differ somewhat from those in the handouts provided at the June 25, 1986, presentation to the Nuclear Regulatory Commission (NRC) staff. This response reflects the program as it is being presently implemented.

- Figure 1, "Assessment and Disposition," shows the general steps taken to evaluate weld quality issues, to disposition any associated deviations, and to resolve these issues. A block displaying "Project Procedures" (Block 8) was added for completeness. A block displaying "Group CA/Acceptance" (Block 9) replaces two previous blocks labeled "Corrective Action" and "EC/QI Closure".

- Figure 2, "Sampling Plan and Group Disposition," shows that part of Figure 1 which is used to sample, examine, and accept groups. Graphic improvements are the differences from the June 25th handout.

- Figure 3, "Generic Problem Analysis (GPA)," shows the process for determining the probability of the existence/non-existence of deviant components, which by engineering evaluation are determined to be unsuitable for service in the unsampled portion of the population based on the results of the sampled population. Blocks displaying when a generic problem is declared and when it is not are added to clarify this disposition process.

- Figure 4, "Project Procedures," shows the process used to identify if there are any other deviant components which by engineering evaluation are determined to be unsuitable for service. The title of Block 1 has been changed to Causal Factor Analysis.

Sample expansion and the conditions that could result in a 100% reinspection of a sampled population are described in Sampling Plan (Figure 2), Generic Problem Analysis (Figure 3), and Project Procedures (Figure 4). On a case by case basis if there is a deviant attribute(s) that cannot be dispositioned use-as-is in accordance with the applicable code, engineering judgement will determine whether additional evaluation is appropriate.

Assessment and Disposition (Figure 1)

Assessment Plan (Block 1)

An Assessment Plan is prepared that directs the evaluation process of each group of welds being evaluated. The assessment plan defines the issue that created the group, the boundary of the group, the method for evaluating the issue, and the criteria for the issue being evaluated.

The methods of evaluation are: Documentation/Plant Examination Analysis (Block 2), Engineering Analysis (Block 3), Documentation Analysis (Block 4), and Examination (Block 5).

Assessment plans are revised, as necessary, to provide further direction of the assessment process whenever the initial assessment process will not resolve the issue for which the group was formed.

Documentation/Plant Examination Analysis (Block 2)

Documentation review and/or examination of the welded components is applied when it has been determined to be appropriate to provide data to evaluate the group issue. An example would be an issue arising from a concern that certain welds were not inspected. The assessment plan would first direct the evaluation to a document review to determine if quality records demonstrated that the welds were inspected. If the records demonstrate that the inspection(s) was performed, the issue would be closed (Block 9). If such quality records are not available or are incomplete, the assessment plan would then require an examination of the welds and subsequent evaluation of the examination results (Block 5).

Engineering Analysis (Block 3)

Engineering analysis is an assessment of a potential problem to determine whether or not a problem exists, the extent of the potential problem, and its potential effect. It would involve engineering evaluations as appropriate, to determine the significance of the implied problem or to resolve the problem. Engineering evaluation is involved when

documentation review and/or plant examination using visual or NDE methods are not capable of resolving the issue for which the group was formed. An example would be an issue about possible excessive heat input to the base material of stainless steel piping during fabrication. The effects of such a condition on hardware (sensitization of material) would be evaluated by an engineering analysis to determine the significance of the problem. If this analysis indicated insignificant effects on hardware performance, the issue would be dispositioned accordingly and closed (Block 9). If the engineering analysis indicated a significant effect on the hardware performance, the assessment plan would be revised to perform the appropriate examination (Block 5). The assessment plan would be modified as necessary until the concern is fully evaluated and dispositioned (Block 9).

Documentation Analysis (Block 4)

Documentation analysis is a search and review of existing documentation including weld and inspection records, drawings, and other documents. This is performed to determine the existence or extent of a potential problem.

Documentation analysis is applied when it has been determined that a documentation review is the appropriate means to provide data to evaluate the group issue. An example would be a concern that a welder or inspector was not qualified (that is, did not possess the appropriate certification to perform the assigned responsibilities). A review of the appropriate certification documentation would be performed to evaluate and disposition this concern. If the records confirm that a welder or inspector was certified the issue is resolved and reported; if not the assessment plan would be revised to specify another method to resolve this issue.

Examination (Block 5)

Physical examination of plant welds is applied when it is the appropriate way to provide data to evaluate a group issue (Figure 2, page 10).

Examples would be a concern that some welds contain subsurface defects or a concern that surface conditions of some welds do not meet applicable code criteria.

Suitability-for-Service Analysis (SFSA) and Generic Problem Analysis (GPA) (Block 6 and 7)

These blocks identify the analyses performed to evaluate the acceptability of components with observed hardware deviations and the generic implications for the unsampled portion of the population. These are explained in more detail, with examples in the Figures 2 and 3 response (pages 8 through 14).

Project Procedures (Block 8)

This block defines the process used to identify if there are any other deviant components which by engineering evaluation are determined to be unsuitable for service. Examples are provided in the discussion of Figure 4 (pages 15-17).

Group Corrective Action (CA) and/or Acceptance (Block 9)

Deviant components identified by the assessment process will be identified and reported to TVA for hardware and/or programmatic corrective action as appropriate. Even though SFSA and GPA do not indicate a problem, it is the intent of the program to take corrective action to insure compliance with applicable codes. WEP will concur with TVA proposed corrective action when such actions are in accordance with the applicable codes. After concurrence and after either completion of the corrective action or the commitment to the performance of the corrective action, WEP will close each group and issue a report to TVA which indicates that the group's welds meet code requirements or will meet code requirements when corrective action is implemented.

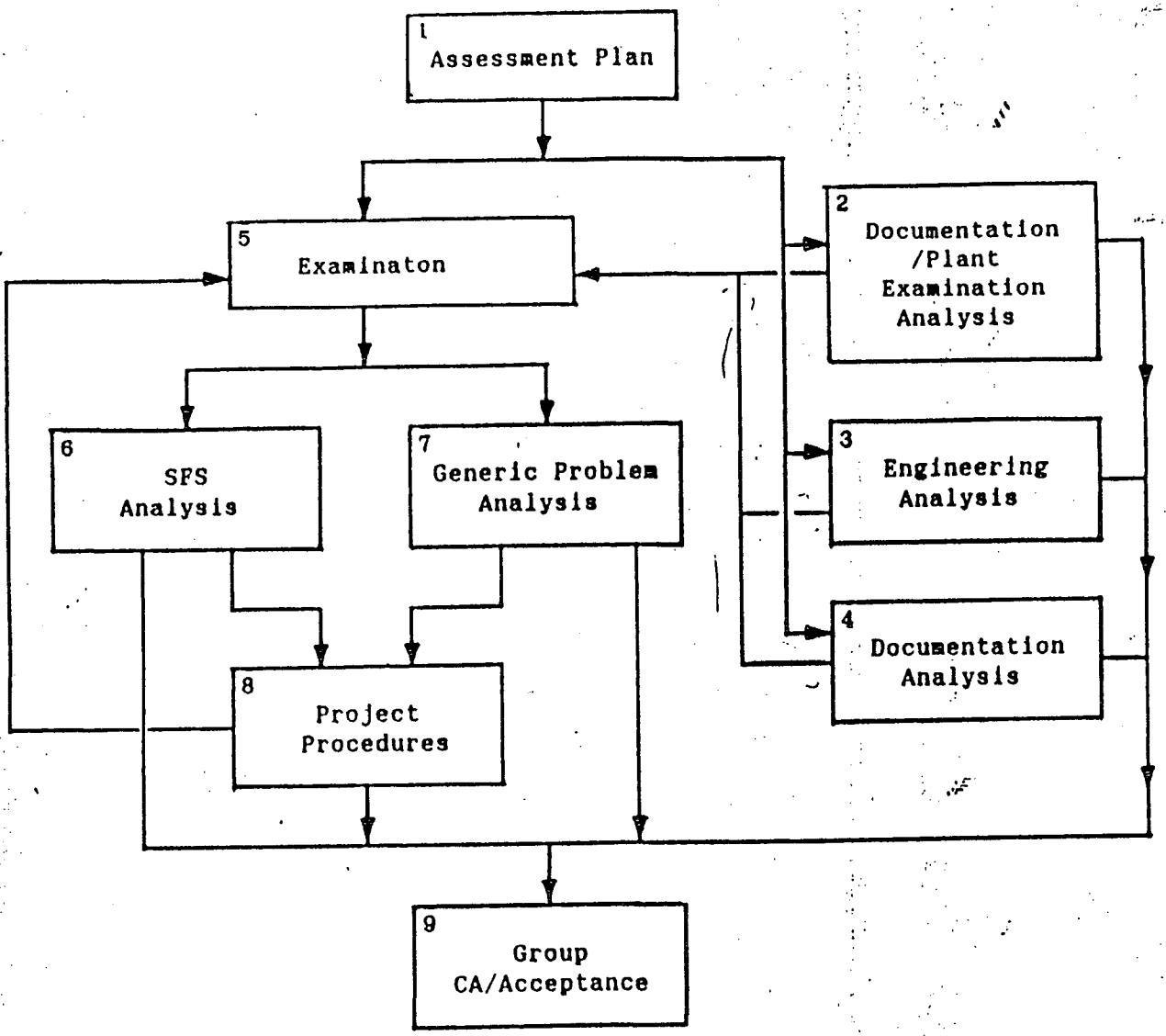


Figure 1. Assessment and Disposition.

Sampling and Group Disposition Plan (Figure 2)

General Discussion

Figure 2 shows the multiple sampling and group disposition plan basically described by Nuclear Construction Issues Group document (NCIG-02) "Sampling Plan for Visual Reinspection," for the examination of AWS, ASME, and ANSI welds. The sampling plan applies to groups whose assessment plan identified sampling techniques. The samples which will be evaluated are drawn from the group by a random selection process. This process is designed such that each component in the group has an equal chance for selection. The number of samples selected for examination is based on the group component size. An appropriate number of samples are identified to demonstrate that there is a 95% or greater confidence that 95% or more of the components within the group (population) meet the applicable code criteria for the attributes which assess the issue for which the group was formed.

For a statistically infinite group, i.e., 2179 or more components, the required sample size is 64 components for the initial examination. Fifty additional components will be selected for each of the first and second expansions of the three-stage multiple-sampling plan. In other words, 64 components are selected for the initial sample (1st stage), 50 additional components make up the first expansion (2nd stage), and another 50 components are selected for a second expansion (3rd stage). These constitute the three stages and correspond to the numbers on Figure 2.

This sampling plan has four scenarios for accepting populations based on examination of components (Block 1) and analysis of results:

- No deviant component is found after examination of the sample population (Block 2).

- One or two deviating components are observed during the examination, but they are evaluated as suitable for service, as allowed by the applicable code, after expanded examinations of the populations (Blocks 3, 1, 4 and 2).

- One or more deviant components are observed during the examination, but after SFSA and GPA they are evaluated as being suitable for service, as allowed by the applicable codes(Blocks 5, 7, and 8).

- One or more deviant components which are evaluated unsuitable for service are identified during the examination, followed by identification of all such components in the population,through application of Project Procedures (Blocks 5 and/or 7, 6, and 8).

Specific Discussion

The scope of Generic Problem Analysis (Block 7) and Project Procedures (Block 6) is described in the discussion of Figures 3 and 4 (pages 11 through 17). The scope of Group Corrective Action/Acceptance (Block 8) was previously described (page 4).

Examination and Potential Expansion (Blocks 1, 2, and 3)

The following description applies to all welded components examined under the sampling plan. If no deviant components remain after initial examination (Block 1) of 64 components, the population is accepted (Block 2). Deviations found that had been previously evaluated and dispositioned with adequate technical justification by TVA are considered to be non-deviant.

If one or two deviant components are identified in the initial sample, a decision is made to either expand the sample (Block 3) or to perform SFSA and GPA (Blocks 5 and 7). If sample expansion is selected, 50 additional components, per deviant component identified in the original 64 in the group, are selected and examined. If no more than one component is found deviant in a sample of 114 components, or two in a sample of 164 components, and the deviant components are evaluated as suitable for

service by analysis, the population is accepted (Block 2) without GPA. For example, if a general group of pipe supports has no deviant components following examination of the original 64 components, it is accepted. If the same group is selected for expansion for one or two deviant components observed in the original 64, and if there still are only one or two deviations after expansion to 114 or to 164 components and if these deviations are determined not to require corrective action, the group will be accepted.

If three or more deviant components are identified a GPA as well as a SFSA must be performed. However, if one or more deviant components are determined to be unsuitable for service Project Procedures (Figure 4) are invoked and a GPA is not performed. For example, if one or more ~~cracks~~ missing welds are discovered during the initial examination of a group, and the components are evaluated to be unsuitable for service then Project Procedures must be implemented.

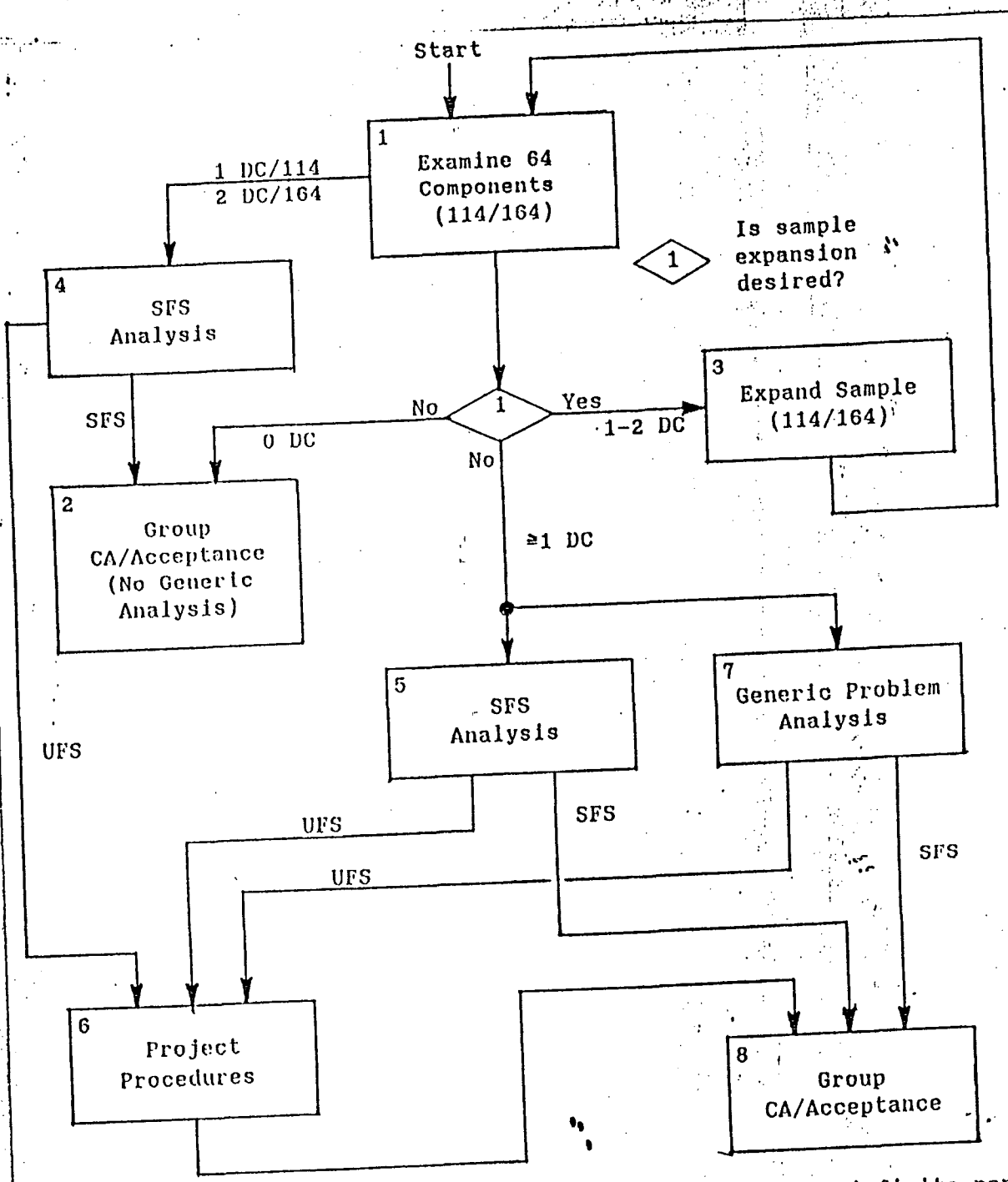
The population will be accepted (Block 8) if the deviant components identified in the initial examination are found to be acceptable, based on SFSA and GPA evaluations, otherwise Project Procedures are invoked.

Suitability-for-Service Analysis (Blocks 4 or 5)

TVA will perform an engineering evaluation for each deviant component identified to determine if the component could perform its intended safety function for all postulated design loading conditions. WEP will review and concur, as appropriate, with TVA's analysis. Even though SFSA and GPA do not indicate a problem, it is the intent of the programs to take corrective action to insure compliance with applicable code. The cumulative effects of the weld deviations of the components shall be appropriately evaluated.

SFSA allows removal of conservatism in input design loads. The cumulative effects of the weld deviations of the components shall be appropriately evaluated. Actual material properties can be used in the analysis when they are included in the existing design analysis, and when the properties can be verified or are representative of the total group.

For example, after sampling 164 components in a special or general group of electrical supports, one component may have a deviant weld profile and another a deviant weld length. A separate analysis will be performed for each of the two deviant components (Block 4). Presuming these two components are evaluated as being suitable for service, the group will be accepted and declared to require no generic problem analysis (Block 2). (Block 5 evaluations are identical to Block 4 evaluations.)



Note: Sampling expansion numbers (114/164) are based on an infinite population.
SFS - Suitable for Service
UFS - Unsuitable for Service
DC - Deviant Condition

Figure 2. Sampling and Group Disposition Plan.

Generic Problem Analysis (Figure 3)

General Discussion

Generic Problem Analysis is a process that is used to determine the implications of observed deviations on the unsampled portion of the population. When GPA is implemented, one of three scenarios will occur:

- o A review of the frequency and significance of the deviant weld attributes indicates no potential generic problem(s) exist,

- o The frequency and/or consequence (significance) review indicates that a potential generic problem exists, but further examination of a sufficient number of components reveals all components be dispositioned as being suitable for service, and thus the group is determined to have no generic problem, or

- o After further examination of additional components, the review verifies a component(s) exists which is unsuitable for service, in which case a generic problem will be declared and Project Procedures must be implemented.

Specific Discussion

Frequency and Critical Attribute Analysis (Blocks 1 and 2, Figure 3)

The relevant deviant weld attributes and the number of times each attribute is examined for all components in each weld population will be obtained from the weld examination records. The ratio of the number of times each attribute, except for critical attributes is found deviant to the number of times the attribute is examined in the sample is calculated. If this ratio is less than 0.05, for all deviant attributes, and there are no critical attributes, the analysis is terminated. If the ratio is greater than or equal to 0.05, or if the sample has critical attributes, a consequence analysis is performed. Critical attributes include cracks, missing welds, and those deviant attributes that cannot be dispositioned use-as-is by the applicable code. Even though SFSA and GPA do not indicate

a problem, it is the intent of the program to take corrective action to insure compliance with applicable codes. For example, a special Employee Concern group might be those welds for all Unit 1 safety-related electrical supports in the auxiliary building at the 713-foot elevation. Examination results indicate the incomplete fusion criterion for the welds actually sampled exceeded the preset limit of 5.0%. Hence, a consequence analysis would be performed on the group.

Consequence Analysis (Block 3, Figure 3)

For this analysis, the physical configuration of each deviant component will be categorized and transmitted to TVA. TVA will provide the as-designed (AD) and as-constructed (AC) stresses, based on the same loading conditions, for each deviant welded connection within the group. For these connections by category, the highest AC/AD ratio is multiplied by the highest as-designed stress of the deviant welded connection in the category. If the product of the calculation above is less than or equal to 100% of the design allowable stress for each category, the group is declared to have no generic problems. For those categories which exceed 100% of the design allowable stress, a causal factor analysis is performed to determine a potential cause(s).

As an example: deviant components are characterized into the following categories: hanger-to-base plate, unistrut connections to structural steel, and cable tray supports. The highest AC/AD ratio is multiplied by the highest AD stress; if this product exceeds 100% of the allowable stress in one or more of these three categories, the group is then further evaluated. For instance, in the cable tray support category the highest design stress on any support was 20,000 psi. Another of these supports had deviant conditions which had the effect of doubling the original design stress from that intended (AC/AD). Had this occurred on the 20,000 psi support, the stress would have been 40,000 psi. If this potential stress exceeds code allowable, a Causal Factor Analysis is performed. If not, the group is declared to have no generic problems.

Causal Factor Analysis (Block 4)

If any product of the calculation described above in Consequence Analysis exceeds 100% of the design allowable stress, WEP will evaluate the weld configuration, the weld procedure used, the welder and/or the weld inspector, or other potential contributors for all deviant attributes to see if a cause(s) for the deviation can be isolated and/or defined. If this evaluation does not isolate the cause or causes of these deviations, the initial sample will be expanded by a minimum of 30 components to determine if there is at least a 99% confidence that at least 95% of the components in the group meet the appropriate acceptance criteria (Block 5). Examination packages will be prepared for the additional components, the attributes to be examined identified, and the deviations reported to TVA for resolution (see Figure 2). Following a SFSA, if all components are dispositioned as suitable for service , the population is declared to have no generic problems (Block 6). For example, if the causal factors cannot be determined for a special Employee Concern group of structural steel members bounded by the concern, 30 additional components are randomly selected and examined. If the resulting deviations are dispositioned as suitable for service, the group is declared to have no generic problems. If any deviant component is identified which cannot be so dispositioned, a generic problem will be declared (Block 8) and Project Procedures will be implemented (Block 9).

If the causal factors are determined, a random sample is selected from the boundary which includes the causal factor(s) to determine if there is at least a 95% confidence that 95% of the components meet the appropriate acceptance criteria (Block 7). An example of this is, for a group of electrical supports, the causal factors may be welds fabricated by a specific welder. A new population is bound within the original group and additional components are randomly selected for examination. If there are no deviations, or resulting deviations are dispositioned as suitable for service, the population is accepted (Block 6). If any deviant component which is unsuitable for service is identified from the new group, a generic problem is declared (Block 8) and Project Procedures are implemented (Block 9).

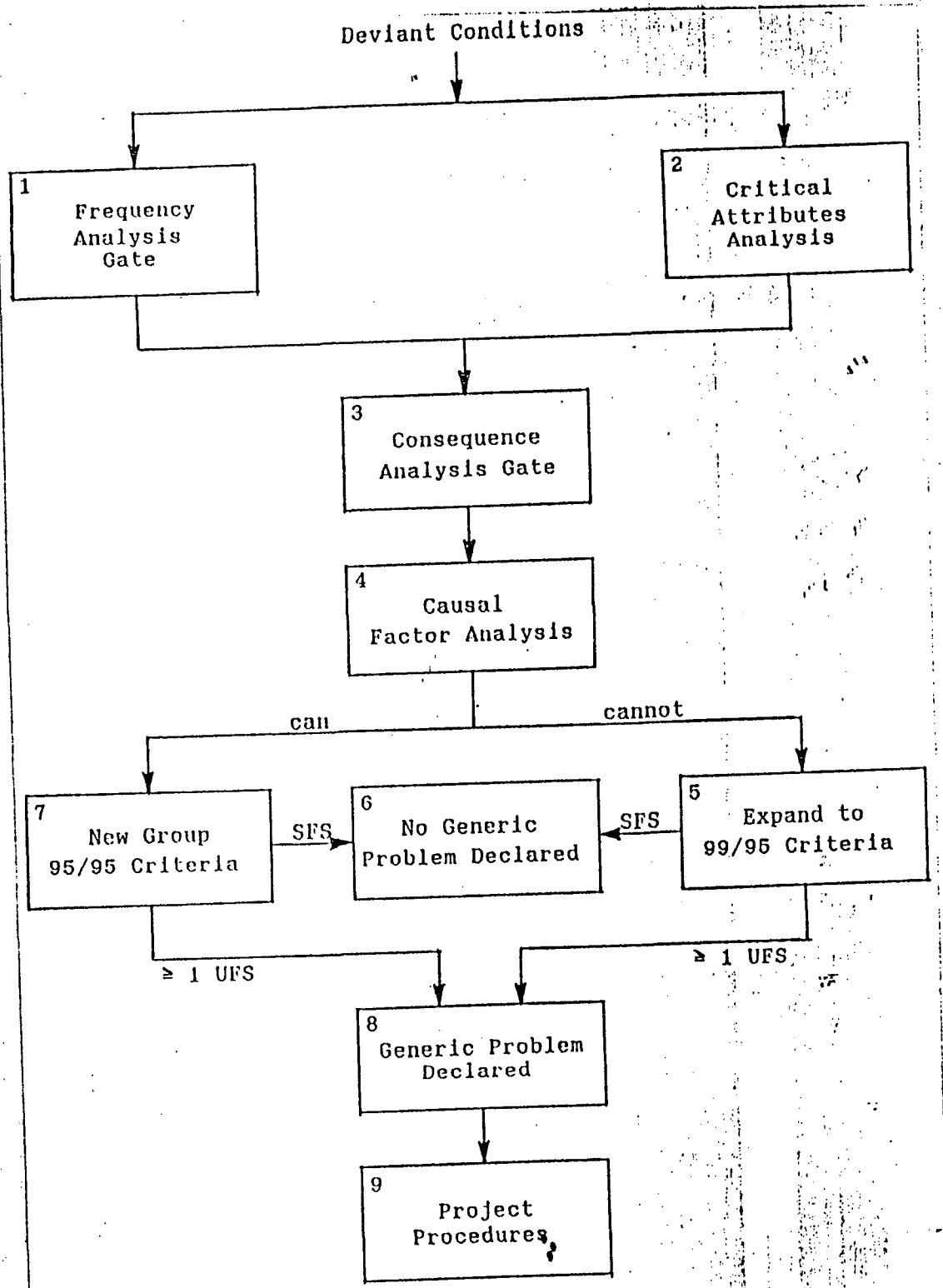


Figure 3. Generic Problem Analysis.

Project Procedures (Figure 4)

Project Procedures is the process used to identify if there are any additional unsuitable for service components in a population already evaluated as containing at least one such component. The sequence of actions in implementing Project Procedures is as follows: causal factor analysis (Block 1), examination of additional components (Block 5), or initiation of a 100% examination of original group (Block 4) or isolation of the problem boundary (Block 2), and examination (Blocks 3 and 6). The 100% examination expansion process may be terminated when a documented engineering judgement so justifies.

The weld configuration, weld procedure, welder, inspector, or other potential contributors will be reviewed to determine a causal factor(s) for the initially unacceptable components (Block 1). If the causal factors cannot be identified there is an option to either initiate 100% examination of the original group (Block 4) or examine additional components (Block 5) to the extent required to determine the cause(s). Once the causal factors are identified the problem-area group is bound, an assessment plan is then developed, and examinations are performed (Blocks 3 and 6). For the isolated problem-area group, 100% examination of the group's components is initiated (Block 3) and the original group from which the problem area group was removed (Block 6) is repopulated and examined to the extent required to maintain the 95%/95% criterion specified in NCIG-02.

For the problem-area group and potentially from the rebound and repopulated original group, WEP will concur as appropriate with TVA's corrective action proposals to restore the group's components to the applicable code requirements.

For example, three structural support components exceeded 100% of design allowable stress. The causal factor analysis shows that the welds were modified to remove material for access to other components in late 1981. A group was formed of all welds made for this reason, and all (100%) of this new group's welds were examined. When the problem area population was removed from the original group, the three deviant components which

were unsuitable for service along with sixteen similar acceptable components were removed from the original group sample. The original group sample was repopulated with 19 replacement components to maintain the original 95%/95% criterion.

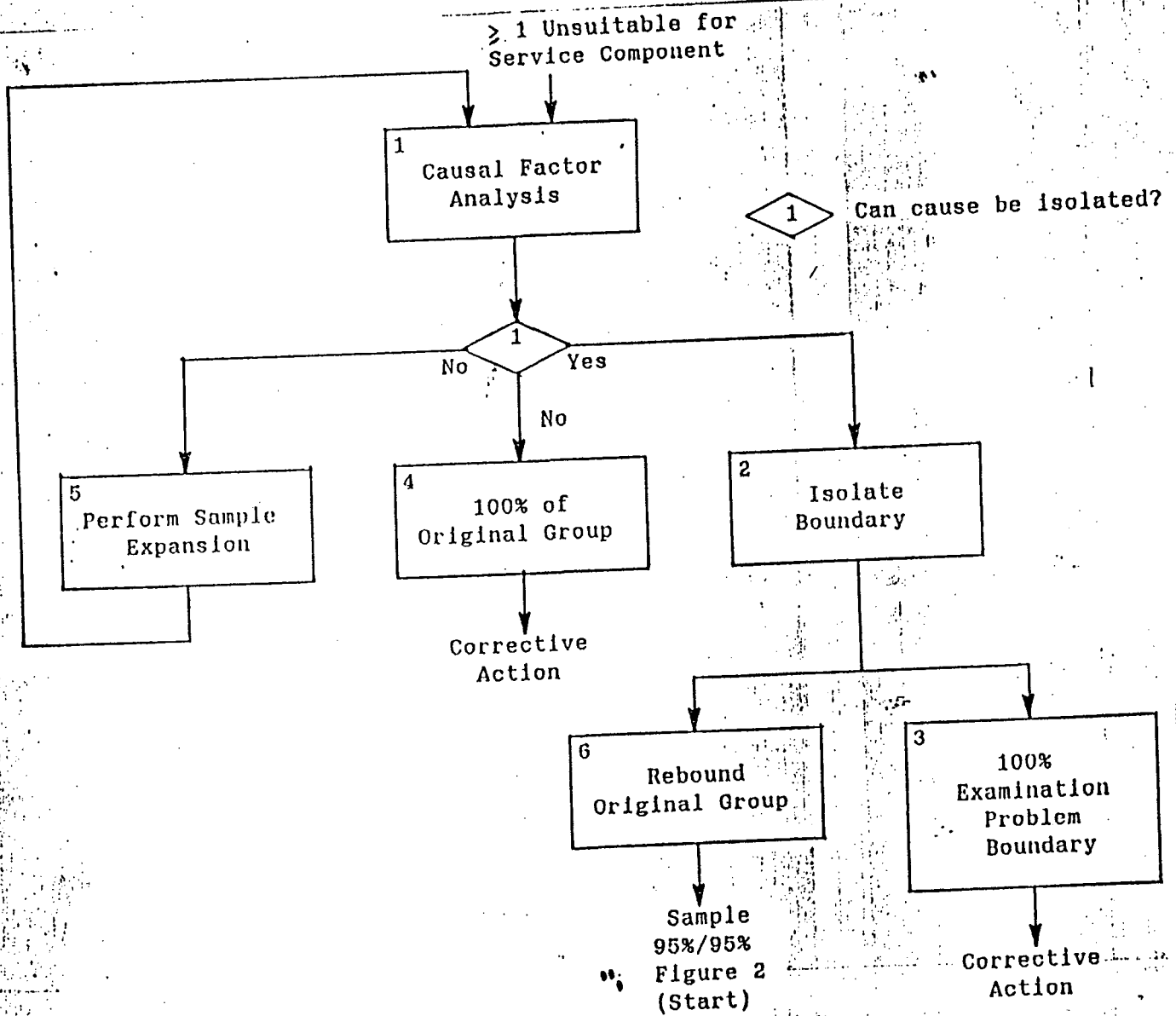


Figure 4. Project Procedures

QUESTION 7

AITACHMENI 2

Approximately 8000 documents deemed "Quality Indicators" were reviewed as an aid in identifying potential nonconforming areas. These indicators and the results of this review are as listed below.

Quality Indicator(s) Types	Total Number Documents	Total Weld Related	Evaluation Groups Formed	Total of Each Type
Nonconforming Condition Reports (NCR)	6899	2686	30	121
Safety Inspection (SIS)	118	46	--	--
NRC Enforcement items	170	57	4	6
10 CFR 50.55 (e) Reports	102	34	1	1
QA Audits	120	79	--	--
Black and Veach Review	1 Report	1 Report	1	1
Discrepancy Reports	511	65	--	--
Institute of Nuclear Power Operations (INPO)	2 Reports	2 Reports	--	--
NRC Allegations	9	7	--	--
Report Adverse to Quality (RAC)	32	31	--	--
Stop Work Orders (SWO)	3	3	--	--
NSRS Reviews	20	15	1	1
Compilation and Summary of Quality Reviews	1 Report	1 Report	--	--
Construction Project Evaluation	1 Report	1 Report	--	--
Annual Assessment of TVA QA Program	1 Report	1 Report	--	--
Quarterly Assessment of TVA QA Program	1 Report	1 Report	--	--
Overall Constructor QA Program Assessment Report	1 Report	1 Report	--	--
OE Audits Concerning Welding	92	92	--	--
Corrective Action Reports (CAR)	22	22	3	4
TOTALS	8106	3115	40	134

This is the updated figure. It was 122

QUESTION 13

ATTACHMENT 1

1. TVA/DNQA will develop a procedure detailing the program for review of vendor welding.

2. TVA/DNQA will determine the vendors and respective population sizes for safety related commodities which have had welding performed on them.

3. Under the direction of the Site Quality Manager, the following indicators shall be reviewed for adverse trends towards a specific vendor:

   a. Nonconformance Condition Reports

   b. NRC I&E Bulletins

   c. Corrective Action Reports

   d. Generic Employee Concerns

   e. Construction Appraisal Team Reports

   f. Welding Task Group Concerns

   During this review, he will determine if prior corrective actions taken alleviate the need for a review of the specific vendor.

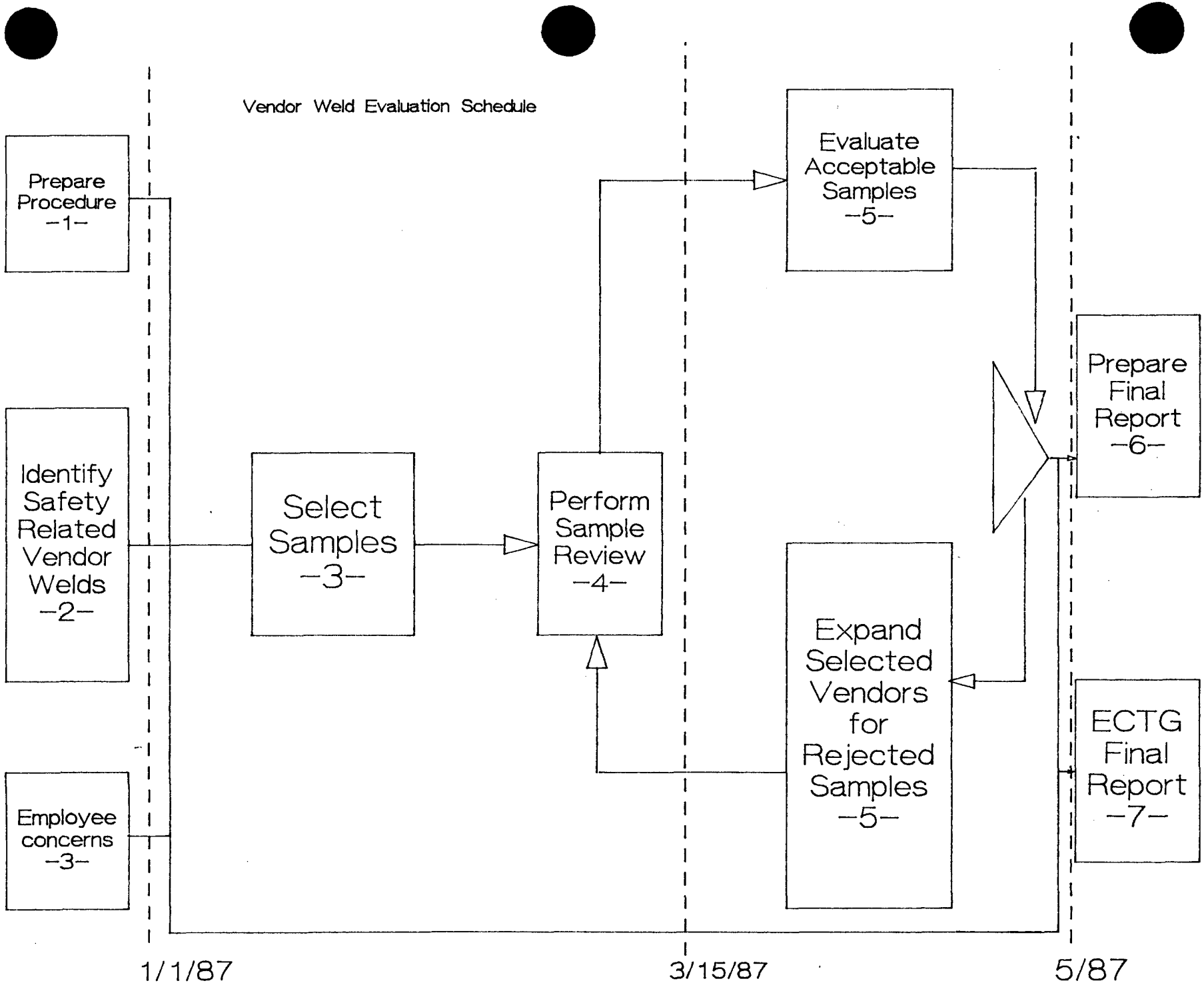
4. Upon completion of the detailed evaluation of the indicators and establishment of population sizes, he will direct a sample program in accordance with NCIG-02 on vendors whose programs have had known discrepancies or items which inherently have welding nonconformances.

   The sample inspection will be performed utilizing the same visual inspection criteria or NDE criteria that was used by the original manufacturers' requirements. Nonconformances shall be reported to DNE for their evaluation and disposition. Results of visual inspections shall be documented on attachment 3.1. Results of NDE inspections shall be documented on the applicable TVA NDE report attached to an attachment 3.1.

5. DNQA will perform an assessment based upon inspection results and NCR dispositions and required root cause analysis. Based upon this review, selected vendor welds will be subjected to expanded sampling and/or 100% reinspection.

6. Following the completion of the inspection program, the Site Quality Manager shall generate a final report detailing the results of this review.

7. DNQA will provide the results of the vendor weld evaluation to Employee Concerns Task Group (ECTG) for inclusion into their final report.


Vendor Weld Evaluation Schedule
Prepare Procedure -1-
Identify Safety Related Vendor Welds -2-
Employee concerns -3-
Select Samples -3-
Perform Sample Review -4-
Evaluate Acceptable Samples -5-
Expand Selected Vendors for Rejected Samples -5-
Prepare Final Report -6-
ECTG Final Report -7-
1/1/87
3/15/87
5/87

QUESTION 15

ATTACHMENT 1

Other Bidders on Request for Proposal for Reasssessment of Radiographs

U. S. Testing
1415 Park Avenue
Hoboken, New Jersey 07030

Wyle Laboratories
7800 Governors Drive West
Huntsville, Alabama 35807-5101

Automation/Sperry
Unit of Qual Corp
Shelter Rock Road
Danbury, Connecticut 06810

Laboratory Commercial Services
NDT Division
135 West Trail Street
Jackson, Michigan 49201

INEL
Idaho National Engineering Laboratory

July 8, 1986

Laboratory Commercial Services
NDT Division
Mr. Jack M. Decker
135 West Trail Street
Jackson, Michigan 49201

REQUEST FOR PROPOSAL NO. C86-100970 - EG&G IDAHO WELD EVALUATION PROJECT - WATTS BAR FACILITY - TVA - DAS-76-86

Dear Mr. Decker:

This is a Request for Proposal to provide EG&G Idaho radiograph review of welds for conformance to weld quality and radiographic film quality requirements of the ASME Code Section 111, 1971 Ed. A more detailed description of the work to be performed is contained in Attachment No. 1, Scope of Work.

Please provide the following information with your proposal:

1. The name, address, and telephone number of the person who will have technical direction of the work;

2. The names of key personnel who will assist;

3. Resumes of personnel listed pursuant to 1. and 2. above;

4. A cost proposal including:

   a. Labor categories and names of personnel;
   b. Proposed number of hours to be used in each category or by each individual;
   c. Proposed rate(s) for each category or individual;
   d. Total direct labor;
   e. Applicable overhead rates as approved by Government auditor;
   f. Applicable G&A rate as approved by Government auditor;
   g. Miscellaneous costs (please itemize);
   h. Total costs.

5. The name and address of your cognizant Government Audit Agency and the auditor who performs your audit.

6. The approximate time of the audit which established provisional rates for the current year.

7. A statement that your company will perform the work in the required time and a description of work performed by the proposed personnel which is similar to the work set forth in Attachment No. 1;

8. A completed Organizational Conflicts of Interest Disclosure Statement (Attachment No. 2);

9. A completed Representations and Certifications (Attachment No. 3); and

10. A statement that the enclosed sample Time and Materials Subcontract (Attachment No. 4) would be acceptable, or specify any exceptions.

The following documents are enclosed and hereby form a part of this Request for Proposal.

1. Attachment No. 1 - Scope of Work;

2. Attachment No. 2 - Policies and Requirements for Preparation of Disclosure Statement;

3. Attachment No. 3 - Representations and Certifications;

4 Attachment No. 4 - Sample EG&G Idaho's Standard Time and Materials Subcontract.

It is anticipated that:

1. The work will be performed under EG&G Idaho's Standard Time and Materials Subcontract - Attachment No. 3.

2. Work will begin immediately upon award and completed by August 30, 1986 as indicated in Attachment No. 1, Scope of Work.

Please advise EG&G Idaho if you do not intend to submit a proposal.

Your proposal should be submitted as soon as possible, but no later than July 21, 1986.

EG&G Idaho reserves the right to reject a proposal which is not received by the designated time or which is not considered responsive to the Request for Proposal, and to reject any and all proposals in the best interest of the Government.

Please submit two copies of your proposal to Donald A. Stevens, Subcontract Administrator, EG&G Idaho, Inc., P. O. Box 1625, 1955 Fremont Avenue, Idaho Falls, ID 83415.

Questions may be directed to D. A. Stevens at (208) 526-1858.

Very truly yours,

Donald A. Stevens
Subcontract Administrator

dkw

Enclosures:
As Stated

ATTACHMENT NO. 1

EG&G IDAHO WELD EVALUATION PROJECT
WATTS BAR FACILITY - TVA

SCOPE OF WORK

Review the radiographs of approximately 3000 welds for conformance to the weld quality and radiographic film quality requirements of the ASME Code, Section III, 1971 Ed.

The work is to be accomplished per the schedule listed below. Work would be accomplished on the basis of a 6 day week, 10 hours per day. The contractor must furnish all personnel, equipment, and facilities necessary to accomplish this task.

The contractor's bid shall include a description of the contractor's previous work experience in the review of nuclear component weld radiographs, including a listing of clients and dates served Experience related to the presentation of film review findings to the US NRC is an advantage. The personnel supplied by the contractor for film review shall be current ASNT Level III certificate holders in the radiographic test method. ASNT Certificate Numbers shall be provided. The contractor shall furnish a resume and biographical summary for each individual involved in film review. The contractor shall designate one individual who shall serve as a review team lead/supervisor who shall overview and coordinate the activities of the individuals involved in the review. All personnel involved in the review shall be required to satisfactorily pass a written and practical (i.e., demonstration) examination pertaining to the radiographic test method, which is to be administered by the Site DOE/WEP Level III. The contractor shall be required to satisfactorily pass a quality audit to be performed by a DOE/WEP audit team. Neither the contractor nor any individual involved in the review shall have had a previous affiliation with TVA.

The contractor shall outline in writing a work plan for accomplishing the review, which includes all pertinent details of review procedure, reporting methods, and record keeping. The contractor may be required to provide a formal presentation of review findings and shall be required to provide an accurate and organized report of review status and findings at any reasonable time, upon request.

Schedule

The work start date is July 28, 1986 with the completion date of August 30, 1986.

ATTACHMENT NO. 2

POLICIES AND REQUIREMENTS FOR PREPARATION OF DISCLOSURE STATEMENT REGARDING ORGANIZATIONAL CONFLICTS OF INTEREST

Pursuant to DOE-PR Subpart 9-1.54, it is DOE policy to avoid situations which place an offeror in a position where its judgment may be biased because of any past, present, or currently planned interest, financial or otherwise, the offeror may have which relates to the work to be performed pursuant to this solicitation or where the offeror's performance of such work may provide it with an unfair competitive advantage. (As used herein, "offeror" means the proposer or any of its affiliates or proposed consultants or subcontractors of any tier.) Therefore:

(a) The offeror shall provide a statement which describes in a concise manner all relevant facts concerning any past, present or currently planned interest (financial, contractual, organizational, or otherwise) relating to the work to be performed hereunder and bearing on whether the offeror has a possible organizational conflict of interest with respect to (a) being able to render impartial, technically sound, and objective assistance or advice, or (b) being given an unfair competitive advantage. The offeror may also provide relevant facts that show how its organizational structure and/or management systems limit its knowledge of possible organizational conflicts of interest relating to other divisions or sections of the organization and how that structure or system would avoid or mitigate such organizational conflict.

(b) In the absence of any relevant interests referred to above, the offeror shall submit a statement certifying that to its best knowledge and belief no such facts exist relevant to possible organizational conflicts of interest. Proposed consultants and subcontractors shall submit such information directly to the contracting officer.

(c) The Department will review the statement submitted and may require additional relevant information from the offeror. All such information, and any other relevant information known to the Department, will be used to determine whether an award to the offeror may create an organizational conflict of interest. If such organizational conflict of interest is found to exist, the Department may (i) impose appropriate conditions which avoid such conflict, (ii) disqualify the offeror, or (iii) determine that it is otherwise in the best interests of the United States to contract with the offeror by including appropriate conditions mitigating such conflict in the contract awarded.

(d) The refusal to provide the disclosure or representation and any additional information as required shall result in disqualification of the offeror for award. The nondisclosure or misrepresentation of any relevant interest may also result in the disqualification of the offeror for award, or if such nondisclosure or misrepresentation is discovered after award the resulting contract may be terminated for default. The offeror may also be disqualified from subsequent related Department contracts, and be subject to such other remedial action as may be permitted or provided by law or in the resulting contract. The attention of the offeror in complying with this provision is directed to 18 U.S.C. 1001.

(e) Depending on the nature of the contract activities, the offeror may, because of possible organizational conflicts of interest, propose to exclude specific kinds of work from the statement of work contained in a solicitation for a negotiated procurement, unless the solicitation specifically prohibts such exclusion.

Any such proposed exclusion by an offeror shall be considered by the Department in the evaluation of proposals, and if the Department considers the proposed excluded work to be an essential or integral part of the required work, the proposal may be rejected as unacceptable.

(f) No award shall be made until the disclosure or representation has been evaluated by the Government. Failure to provide the disclosure or representation will be deemed to be a minor informality (FPR § 1 2.405) and the offeror or contractor shall be required to promptly correct the omission.

Mr.
EG&G Idaho, Inc.
P. O. Box 1625
Idaho Falls, ID 83415

Dear Mr.

I hereby certify that, to the best of my knowledge and belief, no conflict exists, whether past, present or currently planned interests (financial, contractual, organizational or otherwise) relating to the work to be performed under Subcontract No.

I have no organizational conflict of interest with respect to (A) being able to render impartial technically sound and objective assistance and advice, or (B) being given an unfair competitive advantage.

Sincerely,

Enclosure 2

Summaries of TVA Welding Consultants Professional Experience

GEOFFREY R. EGAN

SPECIALIZED PROFESSIONAL COMPETENCE

Fatigue, fracture and stress analysis of welded structures including pressure vessels, offshore platforms, bridges and steel framed buildings; fracture control procedures for nuclear pressure vessels; design procedures for nuclear fuel transport containers; integration of fracture mechanics, stress analyses and NDE for fracture safe design; materials selection procedures, welding methods and procedures, and properties of welded joints.

Recent work includes elastic-plastic finite element analysis, the effect of imperfections on structural integrity, significance and effect of residual and restraint stresses on structural performance, measurement of residual stresses; selection of welding procedures for avoiding hydrogen cracking; analysis of defects in containments, repair welds and procedures; analyses of reheat treatment cracking; prediction of stress corrosion crack growth in BWR piping; analyses of safe end failures in BWR vessels; evaluation of corrosion fatigue performance of deep water platforms; fracture analyses of steam generator support components; evaluation of defects in main steam piping; fracture controls for chilled natural gas pipelines; inspection of nuclear steam generators; steam generator performance studies; significance of IGA in steam generator tubes; analysis of coal pulverizer fatigue life.

BACKGROUND AND PROFESSIONAL HONORS

- B.E. (Mech.), University of Canterbury, New Zealand (1966)
- DIC, Imperial College of Science and Technology, England (1970)
- Ph.D., University of London (1972)
- Member, American Society of Mechanical Engineers
- Member, American Welding Society
- Member, Institution of Mechanical Engineers (Chartered Engineer)
- Member, Welding Institute
- Member, The American Society for Nondestructive Testing

SELECTED REPORTS, PUBLICATIONS, AND INVITED LECTURES

A Fracture Control Procedure for Nuclear Pressure Vessels, Conference on Practical Application of Fracture Mechanics to Pressure Vessel Technology, I. Mech. E., London, England (May 1971).

Designing to Prevent Fracture in Tall Buildings, ASCE/IABSE Joint Committee, Technical Committee 18, State-of-the-Art Report (January 1972) (with S.T. Rolfe).

The Significance of Defects in Butt Welds in C/Mn Steels with Special Reference to Fitness for Purpose, Welding Research Abroad (March 1972).

J-A Path Independent Integral for Characterizing Fracture Behavor, Welding Institute Research Bulletin (March 1973).

Compatibility of Linear Elastic (K_{Ic}) and General Yielding (COD) Fracture Mechanics, Engineering Fracture Mechanics, Vol. 5 (1973), pp. 167.

A Comparison of Deformation Parameters for Work Hardening and Non-Work Hardening Behavior, International Journal of Fracture (1973).

Techniques for Assessing Fracture Toughness, Conference on Mechanics and Physics of Fracture, Cambridge University, England (1975).

Repair Welds Without Post-Weld Heat Treatment, International Institute of Welding, Sydney, Australia (1976).

Stress Corrosion Crack Growth and Fracture Predictions for BWR Piping, 1978 ASME/CSME Pressure Vessels and Piping Conference, Montreal, Canada (1978) (with R.C. Cipolla).

Third International Congress on Fracture, Munich, Germany (April 1973).

Finite Element Techniques In Fracture Mechanics, Stuttgart University, Germany (April 1973).

Residual Stresses in Welded Construction and Their Effects, Welding Institute, London, England (1977).

The First US/Japan Joint Symposium on Corrosion Problems in Light Water Reactors, Japan (1978).

The Application of Fracture Toughness Data to the Assessment of Pressure Vessel Integrity, Second International Conference on Pressure Vessel Technology, San Antonio, Texas (October 1973).

Steel Castings for Structural Use, Proceedings of Offshore Technology Conference, Newcastle, England (February 1974) (with S.J.H. Still).

Damage Tolerance Requirements for Heavy Wall Pressure Vessels, Third Annual ASM Materials/Design Forum, Prevention of Structural Failure Through Quantitative NDE and Fracture Mechanics (July 1975).

The Application of Elastic-Plastic Fracture Safe Design, Nuclear Engineering and Design, Vol. 45, No. 1 (January 1978).

The Application of Small Scale Tests to the Prediction of Structural Integrity, Seminar on Small Scale Testing, Milan, Italy (May 1979).

The Significance of Defects in Welded Long-Span Bridge Structures, New York Academy of Sciences, O.H. Amman Centennial Conference, New York (November 1979).

On-Line Monitoring of Critical Components to Improve Reliability, Symposium on Critical Materials and Fabrication Issues, ASME, San Francisco (August 1980).

Evaluation of Weld Repair of Dented Members, Behaviour of Offshore Structures Conference, BOSS' 85, Delft, The Netherlands (1985) (with J. Grover).

Improved Radiograph Flaw Sizing By Digital Image Processing, Fracture Toughness Testing, London (June 1982) (with A.A. Smith).

BIOGRAPHICAL RESUME

JAMES R. MCGUFFEY

Education:

Pennsylvania State University, State College, Pa.
B.S. Metallurgical Engineering, 1943

Professional Experience:

1985 – Present Private consultant skilled in welding, inspection, quality assurance, and metallurgical engineering.

1967 – 1985 Head of the Department of Quality Assurance and Inspection at the Oak Ridge National Laboratory. He supervised 40 engineers, welding, field, and nondestructive testing (NDT) inspectors. He was responsible for the Laboratory-wide quality assurance (QA) program, in accordance with ASME/ANSI NQA-1. He issued a special QA program to comply with ASME Section III for the design, construction, installation, and code symbol stamping of nuclear components. This program included supplemental quality control procedures for all welded fabrication, qualification of inspectors to ASNT SNT-TC-1A, and qualified welding procedures and welders.

He and his organization provided both shop and field surveillance of the welded fabrication of vessels, heat exchangers, pumps, valves, and piping systems for new ORNL research and development facilities. He provided a Laboratory in-service NDT inspection program for the research nuclear reactors to ASME Section XI, as well as an inspection program for boilers, vessels, and cranes to state regulations.

1961 – 1967 Project metallurgist for the High-Flux Isotope Reactor at the Oak Ridge National Laboratory. He was involved in the design and subsequent extensive surveillance of all components; Mr. McGuffey monitored fabrication in some 150 manufacturing plants. He was also Chairman of the ORNL Reactor Experiments Review Committee for three years.

8601 Sandhurst Drive, Knoxville, Tennessee 37923 (615) 693-3213

Professional Experience (continued):

1943 – 1961 Superintendent of the Metallurgical Engineering and Inspection Department of Plant Engineering at the Oak Ridge Gaseous Diffusion Plant. During this time, he supervised 50 engineers and inspectors who performed surveillance of new construction for three large gaseous diffusion plants and all auxiliary facilities. He developed 40 welding procedures and the related operator qualification tests used to qualify 4,000 construction and plant welders. He visited 400 shops to monitor compliance of vendors to the contracts and his field inspectors to internal quality control procedures. These activities required knowledge of all national consensus codes and standards. He also served as editor of the Plant Engineering Standards - documents used for design and procurement of all new mechanical facilities.

Outside Professional Activities:

- Member of the ASME Code Section III Nuclear Fabrication and Examination Subcommittee for 16 years.
- Member of American Welding Society for 25 years. Chairman of Piping Committee Team that issued AWS Standard D10.9 for Qualifying Welding Procedures and Welders. First Chairman of the East Tennessee AWS Section.
- Served on 35 ASME-National Board Nuclear Survey Teams as an expert on welding and nondestructive testing.
- U.S. Delegate to Commission XI of the International Institute of Welding for 3 years.
- Chairman of the Oak Ridge Chapter of the American Society for Metals.
- Author of several papers and served as a teacher for ASME at ASME and AWS national seminars.
- Presented invited papers in England and Brazil.
- Consultant to 20 U.S., Japanese, Swedish, English, and Germany manufacturers seeking ASME Section III approval to construct and code stamp nuclear components.

CAREER SUMMARY ROY BARNARD McCAULEY

President

Roy B. McCauley Associates
Professional Engineers and Consultants

845 Linworth Road East
Worthington, Ohio 43085
Phone (614)
888-0976 or 885-8141

Specilization: Fabrication Metallurgist.

1) Industrial Problems
2) Welding Metallurgy & Engineering Problems
3) Discontinuity Studies & Research
4) Testing & Evaluation
5) Quality Performance Audits
6) Expert Court Witness
7) On Site Courses & Seminars
8) Registered Professional Engineer-Ohio & Ill.
9) Certified Manufacturing Engineer-S.M.E.

Current Ohio State Titles:
Director Emeritus, The Center for Welding Research-NSF
Professor Emeritus, Department of Welding Engineering
Office: The Ohio State University
Welding Engineering Building
Room 275, Telephone (614) 422-6841
190 West 19th Avenue
Columbus, Ohio 43210

Degrees, Institutions, Dates
B.A. - Cornell College - 1940
M.S. - Illinois Institute of Technology - 1943

Teaching Experience

Illinois Institute of Technology
1940-43, Assistant in Metallurgy;Dept. Chemical Engineering
1943-47, Instructor in Metallurgy;Dept.Chemical Engineering
1944-46, Acting Chairman;Dept.Metallurgical Engineering
1947-50, Assistant Professsor;Dept.Metallurgical Engrg.
The Ohio State University
1950-54, Instructor;Department of Welding Engineering
1954-56, Associate Professor;Department of Welding Engrg.
1954-79, Chairman Department of Welding Engineering
1954-60, Research Supervisor;Engineering Experiment Station
1956-83, Professor;Department of Welding Engineering
1957-59, Assistant to the Dean of Engineering
1960-79, Director, Welding Research;Engrg.Exp.Station
1962-83, Ph.D. Examiner,Graduate Faculty
1965-69, Faculty Director,University Libraries
1972-83, Professor of Metallurgical Engineering
1979-83, Director, The Center for Welding Research
1983-Date, Emeritus Professor

Highlights of Honors

1959 National Meritorious Certificate Award: American Welding Society.
1960 Adams Memorial Acadamic Award: American Welding Society
1964-1981 Chairman, Commission on Education, International Institute of Welding. (Only American to hold an IIW Commission Chairmanship in that time period.)
1965 Robert F.Mehl Lecture on Radiography:American Society of Nondestructive Testing.
1966 Silver Certificate: American Society for Metals.
1966 President, American Welding Society.
1967 Chairman,"First International Symposium on Welding Education" of the International Institute of Welding;London,England.
1967 Life Membership:American Welding Society
1972 R.D. Thomas International Achievement Award:American Welding Society.
1974-Date Chairman,Subcommission on Destructive Testing: International Institute of Welding.
1975 Distinguished Service Award: American Welding Society.
1976 Keynote Speaker,"Second International Symposium on Welding Education":International Institute of Welding,Sidney,Australia.
1978 Samuel Wylie Miller Gold Medal:American Welding Society.
1980 Ralph L. Boyer Award for Meritorious Achievement,The Ohio State University.
1980 International Advisory Member,The Welding Research Institute of the Osaka University.
1981 The Silver Certificate:American Welding Society.
1981 Guest Member: Welding Society of Japan.
1983 Honorary Member of the Faculty of the Sun Yet-Sen University. Kaohsiung,Tiawain.
1984 Organizational Member:International Conference on Quality & Reliability in Welding,Hangzhou,China.

Professional Recognition:

1946-Date Registered Professional Engineer-State of Illinois Registeration Number:5560.
1966-Date Registered Professional Engineer-State of Ohio Registeration Number:31314.
1975-Certified Manufacturing Engineer-For Life-Society of Manufacturing Engineers:Registeration Number:0956268.

ROY B. McCAULEY ASSOCIATES

Part-Time Industrial Experience:
Chemist, Columbia Tool Steel-Chicago Heights, IL 1938-39
Vice President, McCauley Alloy Company-Steger, Il 1941-42
Consultant, Manufacturing Metallurgy & Quality Assurance, 1943-
Registered Professional Engineer, Illinois 1941- No. 062-5560
Ohio 1966- No. E-31314
Radiographer-Central District-Armed Services, 1941-52, I.I.T.
Licensed Radioisope Radiographer, A.E.C. 1952-66
Certified Manufacturing Engineer-Life, Society of
Manufacturing Engineers, No. 0956268

Honorary Affiliations: Cornell Men's Senate Key
The Society of Sigma Xi
Tau Beta Pi
Phi Lambda Upsilon
Pi Tau Sigma
Sigma Gamma Epsilon

Principle Publications: (see separate sheets)

Handbook Contributor to: American Society for Metals
American Welding Society
Society for Nondestructive Testing
Society of Tool Engineers
Lincoln Electric Company

Other Career Summaries:

Who's Who in America
Who's Who in the Midwest
Who's Who in Engineering
Who's Who in Education
Who's Who in Europe
Who's Who in Technology Today
Who's Who in Robotics
Who's Who in Engineering Technology
The Blue Book
Leaders in American Science
Who Knows and What
Honorarium Americana
Engineers of Distinction
American Men & Women of Science

Scientific and Professional Society Affiliations:

Member - American Society for Metals, 1941-date
Education Committee - 1947-52
Seminar Committee - 1948-54
Handbook Committee - 8th Ed. 1957-58
Handbook Chapter Chairman - 1964-71
Member, Joining Division Council - 1982-date
Member - American Society for Engineering Education, 1940-77
Chairman, Curriculum Committee, Ill. Wis. Ind. Sec. 1940-48
Research Relations With Industry - 1962-77
Member - American Society for Nondestructive Test'g, 1942-date
Handbook Committee 1957-65; 1977-81
Robert Mehl Honor Lecture, Radiography 1965

Scientific and Professional Society Affiliations, continued.

Member - American Welding Society, 1956-date
Technical Representative, Columbus Section, 1952-54
Director, Columbus Section, 1954
Secretary, Columbus Section, 1954-55
Vice Chairman, Columbus Section, 1955-56
Chairman, Columbus Section, 1956-57
Executive Committee, Columbus Section, 1957-58
Vice Chairman, National Educational Activities Comm.1956-8
Chairman, National Educational Activities Comm.1958-59
National Nominating Comm. 1958-9
Meritorious Certificate Award, 1959
National Membership Committee, 1957-60
Director-at-Large, 1960-63
Adams Memorial Membership Award, 1960
Vice President, 1963-65
Chairman, Publications & Promotions Council, 1963
Chairman, Technical Council, 1964
Chairman, Districts Council, 1965
President, 1966
Chairman, Administrative Council, 1966
Chairman, Nominating Committee, 1967
Life Member, 1967
Board of Directors, 1967-70
Chairman, Executive & Finance Committee, 1968-70
Member, Educational Activities Committee. 1969-76
Weldability Committee, AWS-WRC, 1972-date
Pipeline Materials Task Force, AWS-WRC, 1973-date
Chairman, Committee on Higher Education, 1977-80
Samual W. Miller Gold Medal, 1978
Resistance Welding Committee, AWS-WRC, 1982-date

Member - International Institute of Welding, 1960-date
Expert, American Council, New York City,1961
Expert, American Council, Oslo, Norway, 1962
Expert, American Council, Helsenki,Finland, 1963
Chairman, Commission on Education, Prague, Czechoslovakia,1964
Chairman, Commission on Education, Paris,France, 1965
Chairman, Commission on Education, Delft,Holland, 1966
Chairman, Commission on Education and Chairman of the Colloquium on Education, London,England, 1967
Chairman, Commission on Education & Expert,Commission on Testing, Warsaw,Poland,1968
Chairman, Commission on Education & Expert,Commission on Testing,Kyoto, Japan, 1969
Chairman, Commission on Education & Member Subcommission 5F Defects in Welds, to date,Lausanne, Switzerland 1970.

Scientific and Professional Society Affiliations, continued.

Chairman, Commission on Education, Stockholm, Sweden, 1971
Chairman, Commission on Education, Toronto, Canada, 1972
Chairman, Commission on Education, Dusseldorf, Germany, 1973
Chairman, Commission on Education, Budapest, Hungary, 1974
Absent due to illness, Tel Aviv, Israel, 1975 ;Member of Commission on Fundamentals of Design and Fabrication, 1975-date.
Chairman, Commission on Education, Sidney, Australia, 1976
Sub-Commission Chairman, 5D, Destructive Testing, 1976-date.
Chairman, Commission on Education, Copenhagen, Denmark, 1977
Chairman, Commission on Education, Dublin, Ireland, 1978
Chairman, Commission on Education, Brataslava, Czechoslovakia, 1979
Chairman, Commission on Education, Lisbon, Portugal, 1980
Sub-commission Chairman 5D Destructive Testing, Oporto, Portugal, 1981.
Sub-commission Chairman 5D Destructive Testing, Boston, USA, 1984.

Member, Welding Research Council, 1953-Date
Weldability Committee, 1953-Date
Pipe Line Committee, 1971-Date
Resistance Welding Committee, 1981-Date

Member, Technical Audits Associates, Inc. 1975

Member, Packer Engineering Associates, Inc. 1985

Member, International Platform Association, 1974-6
Smithsoniam Associates, 1974-81
Organizational Member American Council of the International Institute of Welding, 1961-Date
USA, Technical Advisory Group, ISO/TC-44-SC5, Committee on Mechnical Testing of Welds, 1977-Date

Married: Audrey Paulsen McCauley, October 20, 1943

Children:		
	Roy Barnard McCauley, III	September 20, 1943
	Paul Thomas McCauley	August 23, 1946
	Robert William McCauley	May 21, 1952
	Audrew John McCauley	October, 1955

Special Activities:
Church School Teacher & Youth Activities, Maple Grove Church, Columbus, Ohio
Member, Worthington Garden Club
Board of Trustees, Wesley Foundation, The Ohio State Univ.
Faculty Associate, Blackburn Residence Hall, O.S.U.
Church School Teacher, Linworth Methodist Church

Roy B. McCauley Associates

List of Consultants - Recent 25 years; 1965-Date.

1961-1965 Allis Chalmers Manufacturing Company
1963-1965 Pickands Mather Corporation
1962-1968 Consumers Power Company
1963-1964 Colonial Pipeline Corporation
1964-1965 North American Aviation, Division Space & Information
1960-1980 U.S. Air Force - Arnold Air Force Base
1964-1971 U.S. Corps of Engineers, Tulsa District
1964-1971 Whirlpool Corporation-Research Laboratory
1965-1972 U.S. Naval Ordinance
1967-1971 Bethlehem Steel Corporation
1967-Date National Board of Boiler & Pressure Vessel Inspectors
1969-1979 American Society of Mechanical Engineers
1969-1970 Harnischfeger Corporation
1970-1976 State of Ohio - Highway Bridge Department
1971-1972 Detroit Edison, Inc.
1971-1976 Travelers Insurance Company
1972-1974 Consolidated Edison Company of New York, Inc.
1972-1975 Bishopric Products, Inc.
1972-1974 Sun Shipbuilding, Inc.
1982-1984 Battelle Memorial Institute
1972-1979 Rockwell International Corporation
1972-1973 Zurich Insurance Company
1974-1976 Aerojet Noclear Company
1974-1979 U.S. Corps of Engineers, Huntington District
1974-1978 Allegheny Power Service Corporation
1974-Date Stirling Drugs, Zimpro Division
1974-1980 Aladdin Industries, Inc.
1975-1977 Electric Nutual Liability Insurance Company
1975-1977 Triodyne, Inc.
1976-Date Technical Audits Associates
1976-1977 National Bureau of Standards
1976-1978 The Duriron Company, Inc.
1977-1978 Babcock & Wilcox, Inc.
1977-1978 Picatinny Arsenal, U.S. Army
1977-1978 Consolidated Paper Company
1977-1979 Boeing Airplane Company
1977-1980 General Motors Corporation
1978-1980 Caterpillar Tractor Company
1979-1980 American Manufacturing Company
1980-1981 SKF Industries, Inc.
1980-1981 Parker-Hannifin Company
1980-1983 Brown & Root, Inc. re: S.T.P.
1980-1983 Western Metals, Inc.
1981-1984 Pitman Company
1981-Date Youngstown Steel Door Company
1982-1983 Marion Power Division, Dresser Industries
1982-1983 Andrew Corporation
1982-Date Bucheit International Corporation
1982-1984 Curtiss Wright Corporation
1983-Date Bechtel Power Corporation, re S.T.P.
1983-1984 Zimmer Reactor Overview Committee
1983-Date D.F.K. Fabricators, Inc.

List of Consultants - 1985 - Date: Continued.

1983-Date	C.V.I.,Inc.
1984-1985	Ingersoll Rand Corporation
1984-Date	Phillips Petroleum Company
1984-1985	Potomic Electric Power Co.
1984-1985	Mr James F. Hall,Esq.
1984-1985	Aetnacraft Industries, Inc.
1985-Date	Mr Charles F. Fisher,Esq.
1985-1986	Westinghouse Hanford Company
1985-Date	Motrim Company
1986-Date	Technitank Construction Co.
1986-Date	Continental Hydraulics,Inc.
1986-Date	McGraw-Edison, Inc.
1986-Date	Argonne National Laboratories
1986-Date	Reeves & Murdock
1986-Date	Barkin + Neff

On-Site Welding Engineering / Manufacturing Engineering Short Courses

The Illinois Institute of Technology
The Ohio State University
Dravo Corporation
Allis Chalmers Manufacturing Company
Erie Mining Company
Jeffery Manufacturing Company
Union Carbide Corporation, Nuclear Division
Oak Ridge Nuclear Institute
Bettis Atomic Division, Westinghouse Electric Company
Morgan Engineering Company
U.S. Army Engineers
U.S. Air Force
Humble Oil Company
Inst. of Welding Research,Romania/U.S.Academy of Science
Assoc.Welding Societies of Yugoslavia/U.S.Academy of Science
American Welding Society, School of Welding Technology
North American Aviation Corp., Division of Space & Info.
National Board of Boiler & Pressure Vessel Inspectors
Aladdin Industries
Aluminum Company of America
Union Carbide Corporation, Div. Plastics & Chemicals.
Nuclear Regulartory Authority
Setec Seminarios Technicos, Buenos Aires, Argentina
Kent State University
University of Toledo
American Welding Society, Div. Qualification & Certification
Instituto de Soladura, Lisbon, Portugal
Sun Yat-Sen University, Kaohsiung, Tiawan

TECHNICAL AUDITS OR PEER REVIEW EXPERIENCE

1950-1953	U.S. Atomic Commission, Washington D.C.
1953-1961	Oak Ridge Nuclear Institute, Oak Ridge, TN
1960-1962	Getty Oil Company, Mina Saud, Kuwait
1961-1971	U.S. Corps of Engineers, Washington D.C.
1964-71	U.S. Corps of Engineers, Tulsa, OK
1967-Date	National Board of Boiler & Pressure Vessel Inspectors, Columbus, OH
1968-1977	Editorial Board-"Welding Design & Fabrication Magazine."
1969-1979	American Society for Mechanical Engineers, Boiler & Pressure Vessel Code Stamp Review Committee, N.Y., N.Y.
1974-1979	U.S. Corps of Engineers, Huntington, W.Va.
1976-1980	Trans-Alaska Pipe Line, State of Alaska
1977-1979	Nuclear Regulatory Commission, Washington, D.C.
1981-Date	South Texas Project, Houston Lighting & Power Co.
1982-Date	Peer Review Committee-Technical Articles, "Welding Journal", American Welding Society.
1983-1984	Zimmer Reactor Overview Committee; Cincinnati Gas & Electric Company-D'Appolina Consulting Engineers.
1986-Date	Peer Review Pool, Department of Energy; Argonne National Laboratory,

ARTICLES

Causes and Cures of Defects in Magnesium Castings, Metal Progress, May 1944.

Causes and Cures of Defects in Heat Treating Magnesium Castings, Metal Progress, June 1944.

A Rapid Metallographic Polishing Method, Materials and Methods, June 1946.

Hardness Prediction in Welding, Engineering Experiment Station News, The Ohio State University, February 1954.

The Ohio State University, (R.S. Green & Roy B. McCauley) "The Relationship Between Hardenability of Steel and Their Weldability", Cleveland Ordnance District U.S. Army Research Command, Project No. TB4-10 (RF 509), January 1, 1955.

Welding Engineering at The Ohio State University, Engineering Experiment Station News, The Ohio State University, February 1955.

Behavior of Spot Welds Under Stress, The Welding Journal, February 1956.

Spot Welds Under Stress, The Welding Engineer, May 1956.

One Solution to Manpower—Welding Technology, The Welding Journal, April 1957.

What Industry Can Do to Assist Engineering Education, Proceedings International Acetylene Association, 1957.

Welding Engineering in Engineering Education, Educational Symposium, American Welding Society, 1957.

Effects of Porosity on Mild Steel Welds, The Welding Journal, May 1958.

A Quantitative Evaluation of Residual Stress Relief in Pipe Weldments, The Welding Journal, April 1958.

The Technical Institute in Welding Education, The Welding Journal, April 1958.

How to Educate for Welding, Welding Engineer, August 1960, p. 33-35.

The Ohio State University, Lawrence Friedman & R.B. McCauley, "Influence of Metallurgical and Related Characteristics on Resistance Spot Welding of Galvanized Steel", International Lead Zinc Research Organization, Project No. ZM-97, EES 244, July 15, 1965.

The Welding Industry Needs More Graduate Welding Engineers, Welding Design & Fabrication, March 1961, p. 8-11.

Semi-Automatic Arc Welding: A Basic Cost Cutting Tool, Part 1, Factory, June 1963, p. 80-85.

Semi-Automatic Arc Welding: A Basic Cost Cutting Tool, Part 2, Factory, July 1963, pps. 92-100.

The Ohio State University, Quentin Van Winkle & R.B. McCauley, "Methods for Measuring the Properties of Penetrant Flaw Inspection Materials", Aeronautical Systems Division Air Force Systems Command, Project No. WADD-TR-60-520 (7381) (EES 912), February 1964.

The Effects of Porosity in Quenched and Tempered Steel, The Welding Journal, September 1964, pps. 408-414.

Research to Develop Methods for Measuring the Properties of Penetrant Flaw Inspection Materials, WAD Technical Report, Final (WADD-TR-60-520) (Project 7381 Task No. 738102) Part I, June 1960, Part II, Nov. 1960; Part III, Feb. 1963, Part IV, Feb. 1964.

Measurement and Improvement Methods and Materials Concerned with Dye Penetrant Flaw Detection, 1965 Conference American Society of Quality Control, pps. 113-154.

Examination and Detection of Weld Defects, National Board Proceedings, 35th General Meeting, National Board of Boiler and Pressure Vessel Inspectors (1966), pps. 29-79.

Discontinuity Evaluation, Proceedings of the 1966 Symposium on Nondestructive Testing of Welds, pps. 12-21.

Standards for the Acceptance of Weld Defects, Proceedings Fifth International Conference on Nondestructive Testing, Montreal, 1967, pps. 472-477.

Quality Assurance in Welding, American Iron & Steel Symposium National Metal Congress, Detroit, October 1968, Metals Engineering Quarterly, Feb. 1969, Vol. 9, No. 1, pps. 96-101; also Welding High Strength Steels, Materials and Processing Engineering Book Shelf, American Society for Metals (1969).

Influence of Metallurgical Characteristics on Resistance Welding of Galvanized Steel, The Welding Journal, October 1969, pps. 454s-462s.

The Effects of Porosity on High Strength Aluminum 7039 Welds, The Welding Journal, July 1970, pps. 311s-321s.

The Meetings of Commission XIV - Welding Instruction at the Lausanne Assembly, Welding in the World, Vol. 9, No. 7/8, 1971, pps. 266-269.

Report of the Stockholm (Sweden) Assembly Meetings of the Commission XIV - Welding Instruction, Welding in the World, Vol. 10, No. 5/6 (1972), pps. 160-172.

Report of the Toronto (Canada) Meetings of the Commission XIV Welding Instruction, Welding in the World, Vol. II, No. 5/6, 1973, pps. 173-178.

Ultrasonic Longitudinal Mode Welding of Aluminum Wire, The Welding Journal, June 1974, pps. 252s-260s.

Articles continued

Closed Loop Welding and Inspection, Proceedings Chinese Mechanical Engineering Society, 1984

Stress Characterization of Weld Discontinuities in the Design of Fillet WElded Joints, Proceedings Chinese Mechanical Engineering Society, 1984

DIRECTED THESES

1. Walter Rex Edwards 1953
   Correlation between observed and predicted effects of heat input on the physical and metallurgical properties of the heat-affected zone for bead-on-plate welds.

2. Richard E. Kutchera. 1953
   Mechanisms of embrittlement in titanium alloys.

3. John F. Rudy 1953
   The effects of the macro-metallurgical structure of a spot weld on its physical properties.

4. Gordon E. Cossaboom. 1954
   An investigation of the correlation of weldability and hardenability of steels by use of charpy v-notch impact specimens.

5. David R. Mitchell. 1954
   A study of the weldability of certain Alpha-Beta titanium alloys.

6. Kenneth J. Irwin 1955
   An analysis of the correlation between variable microstructure and energy impact values.

7. Paul W. Turner 1955
   Data on the weldability of certain Alpha-Beta titanium alloys.

8. Jack E. Cook. 1957
   A quantitative evaluation of residual stress relief in pipe weldments.

9. George K. Hickox 1959
   A study of strength factors on induction brazed butt joints.

10. Robert K. Fink 1960
    Studies in the mechanics of brittle fracture in steel.

11. William H. Hill. 1961
    A study of residual stress and cracking in preheated welds of a thin ultra high strength steel.

12. John Deen Bramblett. 1963
    Arc physics - CO_2 fineweld consumable electrode welding.

13. Joe D. Nunnikhoven 1963
    Method of measuring the reflection of a rudy laser arc beam from a metal surface.

14. James Willard Bradley. 1963
The effects of porosity on high-strength steel welds.

15. Ronald P. Hudec. 1965
Measurement of residual stress in a variable restraint weld specimen by x-ray diffraction.

16. Joseph E. Stari. 1965
Incomplete penetration in low-carbon martinsitic stainless steel weldments.

17. Lawrence M. Friedman 1965
Influence of metallurgical and related characteristics on resistance spot welding of galvanized steel.

18. Robert D. Amspoker 1965
The effect of selected heat inputs and arc atmospheres hydrogen percentages on gas tungsten arc welding on 18% nickel maraging steel.

19. Donald Harvey Orts 1967
The effects of zinc coating in resistance spot welding galvanized steel.

20. Ronald J. Shore. 1968
Effects of porosity on high strength aluminum 7039 welds.

21. Ching Hua Chien. 1971
Arc strikes and their influence on pipe material properties.

22. James C. Yeh. 1971
Ultrasonic longitudinal mode welding of aluminum wire.

23. Kenneth Coryell. 1973
Weldability considerations for ASTM A633 high-strength low-alloy pipeline steel.

24. Michael L. Killian 1974
Hyperbaric gas tungsten-arc welding.

25. Carlos Molasco 1974
Welded HAZ toughness characterization of the line pipe ASTM-A-633 steel.

26. Thomas A. Nevitt 1975
Application of hypertaric gas tungsten arc welding to high strength low alloy steels.

DIRECTED THESES

27. Boris Anzulovic 1976
    Analysis of vibrational stress relieving.

28. Israel Stol 1977
    Control of weld metal mechanical properties by control of solidification modes and heat transfer in welding.

29. Scott A. Anderson 1979
    The influences of hyperbaric plasma arc welding on the thermal and mechanical properties of a HSLA microalloyed steel.

30. Bertrand C. Robins. 1982
    An investigation into the mechanical properties of oxygen-cut edges in ASTM A514 steel.

31. Paul Chi-Keung Chung. 1984
    Environmentally-controlled crack growth rate of type 304 stainless steel in high temperature sulfate solutions.

ENCLOSURE 3
ELEVATION 741.0' STRUCTURAL WELDING

Ten weld deviation reports have been prepared by DOE/EG&G documenting improperly welded connections on elevation 741.0' of the control building. A conservative engineering evaluation of these connections by TVA was performed using a static computer analysis that utilized the original design parameters. This evaluation showed that these connections, based on design calculations, were deemed to be unsuitable for service, but did not demonstrate whether or not the structure itself would be unsuitable for service. TVA submitted a 10 CFR 50.55(e) report on this deficiency on November 19, 1986. Because their design features are similar to the connections on level 741.0', four mainframe beam connections on elevation 755.0' in the control building and eleven mainframe connections on floor elevation 729.0' will also require additional inspection and evaluation.

TVA's conclusion to date is that there was a significant deficiency in the implementation of the QA program in this segment of the structural welding program. This deficiency currently appears, based on DOE/EG&G information, to be limited to a small population of structural welds at elevation 741.0' in the control building.

That portion of floor elevation 741.0' where the deficient welds were located is presently being evaluated by TVA's Division of Nuclear Engineering, with the assistance of engineers from Sargent & Lundy, to determine the structural significance of the DOE/EG&G information with respect to the ability of these components and structures to perform satisfactorily in service. Regardless of the outcome of TVA's suitability for service evaluation, TVA will repair all deficient welds found in these connections or make alternate connections if repairs are not feasible.

This deficiency was originally reported verbally on October 20, 1986 in a telecon between Chris Riedl (TVA) and Morris Branch (NRC)

QUESTION 1

ATTACHMENT 3

QUESTION 7

ATTACHMENT 1