

October 29, 1985

Docket Nos: 50-390  
and 50-391

Mr. H. G. Parris  
Manager of Power & Engineering (Nuclear)  
6N011B Missionary Ridge Place  
1101 Market Street  
Chattanooga, TN 37402-2801

Dear Mr. Parris:

Subject: Welding Concerns

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This letter refers to Mr. J. W. Hufham's letter dated October 25, 1985, which proposes a meeting to discuss the TVA welding program and related employee concerns. Following discussions with Mr. Hufham and Mr. Shell of your staff, a meeting has been scheduled for November 6, 1985, at 12:00 p.m. in Room P-422 of the Phillips Building, Bethesda, Maryland.

We request that your presentation include the following topics:

1. A summary of the QTC/ERT findings related to employee concerns on welding
2. TVA's understanding of what the problems are related to welding
3. A description of TVA's plan to address, resolve and correct the problems
4. A description of the EG&G role and work scope
5. A schedule for items 3 and 4 as they relate to the licensing schedule.

Enclosed for your information is a chronology of TVA welding issues which has been provided to the NRC staff. We ask that you consider this information in your evaluation of your welding program and employee concerns.

If you have any questions, please contact Bill Long (FTS 492-7270) or me (FTS 492-7831).

DESIGNATED ORIGINAL

Certified By

*Angela Henry*

Sincerely,

Elinor G. Adensam, Chief  
Licensing Branch No. 4  
Division of Licensing

Enclosure:  
Chronology of TVA welding issues

\*PREVIOUSLY CONCURRED

DL:OB #2	DL:LB #4	
*BLong/ah	EAdensam	*BDLiaw
10/28/85	10/28/85	10/28/85

8511040101 851029  
PDR ADDOCK 05000390  
A PDR

*AD:DL*  
TNovak  
10/29/85

October 16, 1985

TVA WELD ISSUES

ANSI N45.2.5-1974, Section 5.5 states: Inspection of structural steel welding shall be performed in accordance with the provisions of AWS D1.1, Section 6 .... This inspection shall include visual examination of preparations, welding processes, and post-welding operations. Prior to welding, verification of welding procedure and welder qualification shall be documented and shall include all essential variables identified in the procedure. In-process inspections shall include joint fit up prior to start of welding, preheat and interpass temperature requirements, filler metal, control of distortion, post-weld heat treatment, and cleaning requirements." NOTE: FSAR COMMITS TO CONFORMANCE WITH N45.2.5.

April 16, 1980. Bellefonte NCR 1173 states that a welding inspector had "completed G29C visual inspection records" for a series of welds before the welds had been made. The NCR said the apparent cause was: Failure of inspector to check weld map versus welds inspected prior to completing inspection records. Action required by original NCR: "Reinstruct all inspectors on the importance of properly completing QC inspectors records for the inspections that have been made." WRITTEN IN ON 9/22/82, 29 MONTHS AFTER ORIGINAL NCR: Later investigation revealed this was an isolated case and therefore action required to prevent recurrence is not applicable.

June 11, 1980. WB NCR 2375R. "Welds on the above listed components have been previously accepted and they do not meet the requirements for visual examination. This was determined from a random sample. 70 cable tray supports were inspected and 68 rejected. 40 conduit supports were inspected and 8 were rejected. 22 misc steel items were inspected and 13 were rejected. Action required to prevent recurrence: All WEU personnel who inspect fillet welds have been retrained for requirements and have been given mechanical gages to use in weld size determination. NOTE: DISPOSITION BASED ON RELAXATION OF ACCEPTANCE CRITERIA. WHAT REINSPECTIONS WERE DONE TO DETERMINE CONSISTENCY WITH RELAXED CRITERIA?

July 8, 1980. Cantrell to Wilkins re WB NCR 2375R. Refers to Wilkins memo, 6/23/80 (WBN 800623 006). Recommends each weld examined and not in conformance with the design drawings be identified and made to agree or the location, undersize and length of fillet weld information be sent to EN DES for reevaluation. WHAT WAS THE RESULT OF EN DES REVIEW? Cantrell says new drawings will be issued by ECN 2535 to indicate a reduced minimum length of weld required at cable tray support clip angles. "This may alleviate part of the clip angle weld deficiency."

July 21 - 25, 1980. Inspection which led to 80-14. Dahnke and Gilbert contacted. At exit interview, welding engineering unit supervisor "contended that the visual examination program was

basically a good program and that additional procedural requirements were not needed in the magnetic particle examination procedure because the inspectors were properly trained. .. This objection by the WEU supervisor precluded discussions of when the site would be in compliance with the requirements of ASME B and PV Code and the General Welding Procedure G-29M."

August 22, 1980. Meds: 800822 006. RWC/JEW Watts Bar seeks relief from requirements imposed by EN DES for visual inspection of welds on hangers, cable tray supports and clips.

September 3, 1980. Dielbeler, QA/Const to R.A. Costner, QA, EN DES. BQA 800903 002. Re: Significant Audit Deficiency -BN-W-80-08. Found deficiencies at Bellefonte with respect to certain kinds of inspections not being performed: verification of welding procedure and compliance thereto; verification of welder qualification; verification of joint fitup; and verification of correct filler metal usage. Cover letter states that the deficiency is considered significant. Makes findings re kinds of inspections not being performed. (See September 12, 1980 R-II to TVA.) A "partial listing of the type welding where the required inspections are not being performed includes Safety related seismic supports, Safety related cable trays, safety related misc. exposed steel, and safety related seismic pipe supports. Auditors recommend (Item 5) "Nonconform all (both ASME and non-ASME) safety related welding that has not been assigned the inspections/verifications detailed in Section 4 of this deficiency." Revise TVA program to assure that all required prior to and during welding inspections are invoked and performed during all safety related welding. NOTE: BN-W-80-08 led to a 50.55e report submitted to NRC Region II on October 20, 1980. Among other things, the 50.55e stated: "Although this deficiency was originally written on Bellefonte Nuclear Plant, it has been determined to be generic to all TVA nuclear plants under construction." (CS File 4.1.) REFERENCES TO FILLER MATERIAL: 11/5/80, 6/22/81, 10/10/83, 1/12/84, 1/18/84, 1/23/84.

September 4, 1980. TVA EN DES and CONST QA staff issue report "Watts Bar and later Nuclear Plants." This report examined TVA's weld program. The report questioned the adequacy of many significant elements of the welding activity; e.g. qualification and certification of inspectors for visual weld inspection, unavailability of tools necessary to determine weld acceptability, the adequacy of G-29c (finding C-12), audit adequacy, separation of craft and inspection personnel, adequacy of welding engineering personnel and practices, inspector experience, insufficient ratio of inspectors to welders, adequacy of inspector training, inadequate fulfillment of visual

inspection requirements. [WAS THIS REPORT PROVIDED TO NRC? WAS IT REPORTED VIA 50.55e?] (CS File 0.2)

September 5, 1980. In course of NRC inspection 80-22, TVA informs NRC of inadequacies in weld inspection procedures. [See entry dated November 3, 1980.]

September 12, 1980. R-II to TVA. Forwards report of Bellefonte inspection 439/80-14 (conducted July 21-25) and NOV based thereon. Findings were based on NRC inspection involving pipe and structural welds. "The licensee has identified several hundred piping socket and structural fillet welds which had been accepted by visual examination but did not meet acceptance criteria. NOV involves inadequate qualification of visual examiners, improper visual examination of pipe weld, failure of visually inspected welds to meet acceptance criteria, magnetic particle testing procedural deficiencies, and failure to fulfill 50.55e requirement re deficiencies in safety related welds that had been accepted by QC inspectors.

September 12, 1980. R-II to TVA. Attached inspection report (439/80-14) refers to finding from previous inspection, 438/80-07-01, relating to weld material control: "The inspectors reviewed the procedure changes which had been put into operation during the week of July 20. Inspection of the work areas showed several examples which indicated that the program was not yet fully implemented in that the licensee's commitment was full compliance by August 1, 1980.

October 10, 1980. BLN Project Manager to J.C. Killian, Assistant Manager of Construction. Requests OEDC assistance in resolving BLN infractions specified in 439/80-14-01 and 439/80-14-02. These inspections reports cite BLN CONST for having a visual weld examination program that does not meet ASME(??) Code requirements. BLN's and TVA's quality assurance procedure for NDE certification does not require visual examination as an NDE process. NRC says that it is and points out that BLN CONST is amiss in not having visual examinee candidates administered an exam, including a practical test, by a Level III NDE examiner. "As resolution of this infraction could ultimately affect the authenticity of every BLN and TVA Code visual weld examination performed past, present and future, it is requested that responsible NEB Code and OEDC QA personnel formulate the corrective action to be taken along with an engineering evaluation of all code visual examinations performed to date and advise BLN CONST of the results as soon as possible." NOTE: TVA response to NRC on January 13, 1981 says visual examination is not required.

October 20, 1980. 50.55e. Bellefonte. Construction deficiencies; non-ASME welds. Certain categories of safety related welds are not inspected in accord with requirements. States that although

the deficiency was originally written on Bellefonte, "..it has been determined to be generic to all TVA nuclear plants under construction." [CS File 4.1.] (See 80-22, November 3, 1980.)

October 24, 1980. TVA to Region II. "TVA does not agree that our program [re visual examination] is in noncompliance with the ASME code." TVA said that although it believed it was not in noncompliance with requirements that it was concerned with deficient conditions and would upgrade its "entire welding and nondestructive examination program to increase its efficiency."

November 5(3), 1980. 80-22 includes following concerning Inspection Report Item 439/80-22-02 re Safety related Non-ASME Welding Inspection. On September 5, 1980 the licensee informed R-II that adequate measures did not appear to have been established to assure that certain categories of safety related welding received all required inspection verifications. As a result, some welds were not receiving inspections required by ANSI N45.2.5 (1974) including verification of: (1) welding procedures; (2) welding procedure compliance; (3) welder qualification; (4) joint fitup; and (5) correct filler metal usage. The licensee's investigation of this area is continuing. [NOTE: ANSI N45.2.5 requires that structural steel welding be in accord with AWS D1.1. N45.2.5 states that inspections shall include verification of welding procedure and welder qualification. In process inspections shall include joint fitup etc.] NOTE: OTC believes noncompliance with N45.2.5 continues.

December 5, 1980. Region II to TVA. R-II does not accept October 24 explanation stating compliance with the ASME code in response to 80-14's finding that there had been a "failure of visual examination program to comply with applicable code requirements. ..In view of the above, the NOV transmitted to you on August 28, 1980 remains unchanged. Section 2.201 requires you to submit to this office a written statement or explanation in reply including .." corrective steps which have been taken, corrective steps to avoid further noncompliance, and the date when full compliance will be achieved." [WHERE IS THE RESPONSE TO THE DECEMBER 5, 1980 LETTER?] [SEE JULY 14, 1981. R-11 TO TVA.]

January 13, 1981. TVA informs R-II that its October 24 response had adequately taken care of problems. TVA appears to hold to its assertion that its procedures for examination of weld inspectors had always been in compliance with NRC requirements. TVA states it wanted to meet with NRC on January 22. It is unclear whether this meeting took place. A meeting was held on February 2 and follow up telephone conversation occurred on February 4. [See October 10, 1980 cited above.] NOTE: If it is true that inspectors had been adequately qualified, why did they continue to accept welds that should have been rejected?

February 2, 1981. Meeting between TVA and R-II. [WHERE IS THE RECORD?]

February 4, 1981. Follow up telephone conversation. [WHAT WAS DISCUSSED?]

February 5, 1981. Barnett (Chief, CEB) to Cantrell (SQN and WB Design Projects Manager) re AWS welding requirements. Supercedes Barnett memo dated 1/20/81, CEB 810120 004. "The superceded memorandum is to be removed from the files. ... Following a plant visit on January 9, 1981, it became evident problems exist for a large percent of welds where an overstrict adherence to visual inspection requirements of AWS D1.1 requirements are overly restrictive when literally applied to the type structures involved. NOTE: Where are documents removed from files?

February 6, 1981. JEW/RWC. NEB 810206 265. EN DES response to CONST call for help but cautions CONST that all help offered is based on our best estimate pending (a) revision to SAR, (b) review of applicable calculations, and (c) various sampling programs specified in the memorandum. None of the relief would be final until completion of changes to design and licensing process. WHAT CHANGES WERE MADE RE FSAR?

February 8, 1981. Cantrell (WB and SQN Design Project Manager) to Wilkins (PM, CONS, WB): Fillet Weld Visual Inspection Requirements. Lists 5 memoranda WBN 800822006, SWP 801017 012, SWP 801203 074, SWP 801210 058, and CEB 810205 001. "This memorandum supercedes references 2,3, and 4. These shall be removed from the filing system. Reference 1 emphasized the problems associated with visual inspection of welds on pipe hangers and cable tray supports based on the requirements of AWS D1.1 and the impact on the WBN cost and schedule. Subsequent events have indicated that this problem exists for all welding where strict adherence to visual inspection requirements of AWS D1.1 have been invoked. It is agreed that in some areas the requirements are overly restrictive when applied to the type structures involved. [NOTE: WHERE ARE REFS 2,3, AND 4? DID THEY ALLOW RELAXATION OF D1.1? IF SO, DID WHEN DID NRC APPROVE?]

February 20, 1981. TVA sends R-II revised response to 80-14-01. "The training and certification program was not administered by ...a Level III inspector for the reasons stated in our letter dated January 13, 1981; however, TVA believes our program is equivalent to SNT-TC-1A with the exception that we do not assign Level II or Level III status to individuals."

March 6, 1981. Second interim report re 80-08. See September 3, 1980. NOTE REFERENCE TO ANSI D1.1. Indicates nature of ongoing review.

March 10, 1981. Region II to TVA. R-II acknowledges receipt of TVA's February 20 and other responses to 80-14. "Thank you for ...informing us of steps you have taken to correct the item of noncompliance ...brought to your attention in our letter of September 12, 1980. We will examine your corrective actions and plans during subsequent inspections." [WHAT TRANSPIRED? SEE ALSO JULY 14, 1982 LEWIS TO TVA.]

March 12, 1981. TL/MNS. NEB 810312 272. Special Committee formed to resolve problems associated with welded designs. EN DES formed a committee to address problems associated with fabrication of welded designs. They address (a) and (b) per 2/6/81 cited above.

April 3, 1981. TL/MNS. NEB 810406 269. Special TF formed to resolve problems associated with fabrication of welded design. EN DES welding committee commits to revise G29c and initiate SAR revisions as applicable to reflect TVA commitment to AWS D1.1.

May 5, 1981. Third interim response to 80-08.

June 22, 1981. TVA responds to findings of 80-22 and associated 50.55(e) which followed from Construction QA Audit BN-W-80-08. TVA states that it is in full compliance with regard to verification of welding procedure and compliance thereto, verification of welder qualification, and verification of correct filler metal usage. TVA DID NOT INDICATE WHETHER THERE HAD BEEN NONCOMPLIANCE AND IF SO, WHAT HAD BEEN DONE TO CORRECT FOR DEFICIENCIES ARISING THEREFROM. WHAT EVIDENCE EXISTS TO DEMONSTRATE COMPLIANCE IN THESE RESPECTS? TVA'S position on fitup inspection was that the need for same would be specified on a case-by-case basis in engineering drawings. "However, it has been the usual TVA practice to require more rigorous inspection methods such as radiographic testing, ultrasonic testing, liquid penetrant examination, and dry magnetic particle examination in lieu of specifying joint fitup inspection." NOTE: THE IMPLICATION IS THAT RADIOGRAPHY ETC. WAS DONE ON STRUCTURAL STEEL WELDING. WAS IT? TVA said that with respect to fitup, that design engineer's responsibility needed clarification. WHAT IS THE CLARIFICATION AND HOW DID THIS COMPENSATE FOR PROBLEMS THAT MIGHT HAVE ARISEN DURING PERIOD WHEN THINGS WERE NOT SO CLEAR? THERE ARE ALSO INDICATIONS THAT CLARIFICATION WAS NOT ISSUED. WAS IT? NOTE: NRC accepts foregoing explanation on 8/18/82 per 50-438/82-23, 14 months after receiving it. Note: SEE 1/25/82 AND 3/1/82 RE RELAXED CRITERIA.

June 29, 1981. Sprouse to Pierce, Dilworth etc. re "Commitments resulting from EN DES Welding Task Force Meeting of June 1, 1981." SAR's to be revised to mention G-29c. EN DES will issue a single source document to cover items that are normally requirement of AWS and to issue implementation instruction

applicable thereto. HOW MUCH OF THIS WAS DONE? SEE 9/28/81 AND 8/20/82.

August 24, 1981. Cantrell to Raulston. RE: Fillet Weld Sample program. Lists findings.

September 9, 1981. Banett to Raulston. Forwards changes from Civil Engineering Branch to Chief Nuclear Engineer re changes to reflect TVA's practice regarding use of AWS for Category 1 structures. "Please have these changes incorporated in the next SAR amendments submitted to the NRC."

September 9, 1981. (Same as above as described in 6/18/82 Pierce/Jessee chronology.) JAR/ROB. CEB 810909 007. SAR commitments to AWS. SAR commitment changes initiated by CEB to NEB and continue by licensing transmittal No. 327 to regulatory staff in Chattanooga. It will be submitted to NRC in revision 47 to SAR. Telecon with regulatory staff indicated this will be submitted to the NRC on July 26, 1982. [Note: AMENDMENT 47 NOT SUBMITTED TO NRC UNTIL JANUARY 4, 1983.]

September 16, 1981. [Referred to in March 26, 1982 memorandum, Austin to all EEU Inspectors, WBN-CONST.] Cantrell stated EN DES was able to accept all as-built cable tray support fillet welds made prior to February 6, 1982 in all Category I buildings. WHERE IS THE SEPTEMBER 16 MEMORANDUM? WHAT DOCUMENTATION UNDERLIES THIS DIRECTIVE? HAS NRC EXAMINED SUCH DOCUMENTATION?

September 28, 1981. TL/MNS. NEB 810928 292. Welding of AISC. G29c revised as a result of the welding task force to deviate from AWS D1.1. WHO APPROVED THE DEVIATIONS? ON WHAT DATE? SEE 6/29/81, 8/20/82.

November 2, 1981. ENDES to CONST (Cantrell to Wilkins): This is in response to your verbal request that ENDES consider allowing visual examination of welds in accordance with G-29c after coating with carbo zinc. Based on inspection of sample welds and production welds presented for evaluation, this is acceptable provided:

1. carbon zinc thickness is 5 mils maximum. (HOW DID THEY KNOW IT WAS 5 MILS?)
2. all work after this date is examined prior to priming with carbo zinc.
3. welds inspected for weld quality as part of an EN DES sampling program are to be cleaned.

December 17, 1981. Schrandt to QAB Files. Re: WB - Visual Inspection of Welds in Accordance with G-29c - Coated with carbo zinc. Reference to Cantrell, November 2, 1981, SWP 811102 056. The basis for accepting a visual examination of welds already coated with Carbo Zinc primer was established when a group

consisting of Olsen et al. performed a walk-through at WB as well as review of some weld samples in primed and unprimed condition. The walk-through was for the purpose of selecting at random a number of welds previously coated with primer and determining if a competent visual examination could be performed without removing the primer. Mr. Jesse stated that it became apparent that the primer did not create a cover which tended to hide defects which would compromise the design, but instead, made it easier to perform the visual inspection. ... Inspections were quite revealing. It was concluded by all parties that the primed surfaces were probably easier to inspect than the as-welded condition. It was observed that this was a lacquer primer and did not tend to level and run into crevices like epoxy or enamel. HOW MANY INSPECTORS WERE IN THE GROUP?

January 11, 1982. Cantrell to Wilkins (WB CONS Project Manager.) "This memorandum supersedes my memorandum of November 2, 1981. ... All parties agreed that carbo zinc coating did not tend to hide objectionable weld defects but appeared to enhance their visibility. ... Welds inspected for weld quality (defects other than size and location) as part of an EN DES directed sampling program shall be inspected without primer coating unless exempted by EN DES."

January 20, 1982. WATTS BAR NUCLEAR PLANT - NSRS REPORT ON MINIMANAGEMENT REVIEW, R-81-28-WBN. NSRS describes violations resulting from weld inspections being performed by construction organization personnel when the regulations required such inspections to be performed by personnel from the Welding Engineering Unit. This report also described violations resulting from the fact that the Authorized Nuclear Inspector had not approved certain weld inspection procedures. The overall finding concerning the structural welding was that TVA had not adhered to its commitment to conduct such welding in accord with requirements of American Welding Society (AWS) Code D1.1-72.] The January 20 report was provided to NRC Region II which appears to have taken little or no action in response to the violations which NSRS staff believed significant.

January 25, 1982. Mills (TVA) to O'Reilly. Revised Final Report on 50.55e/NCR 2654R. "In a random inspection of 245 Aux Building duct supports inspected before March 27, 1980, approximately 22% were found to have welds which are unacceptable. The defects found include undersized welds, incomplete welds, slag inclusions, porosity, and overlap. The apparent cause was failure to clearly specify acceptance criteria on the applicable drawings. .. Because the subject duct support and cable tray welds were acceptable as installed, this condition would not have adversely affected the safe operation of the plant. [HOW DO THEY KNOW THE WELDS WOULD NOT HAVE AFFECTED THE SAFE OPERATION OF THE PLANT? WHAT ABOUT WELDS OTHER THAN DUCT SUPPORTS?] TVA has reevaluated the subject deficiency. As a result, an alternate

criteria has been established by TVA for visual inspection of fillet welds instead of the stringent requirements of AWS D1.1. . . " NOTE: SEE 8/8/83 FOR NRC RESPONSE TO RESOLUTION.

March 1, 1982. Rankin to Distribution. Re: 2/16/82 Meeting on NCR 2375R and 3579R. Discussion re nature of problem and corrective actions. "Sampled welds should be evaluated to relaxed criteria for fillet welds as defined in memos from Cantrell to Wilkins (2/6/81 and 10/27/81).

March 17, 1981. Rankin (Acting WB and SQN design project manager) to Wilkins re Conduit Supports/Filler welds. Acceptance of cable tray support fillet welds is not considered acceptance of the conduit support welds for the following reasons, etc.

March 26, 1982. Austin to EEU inspectors. [Informal memo, no apparent MEDS number.] Cites Cantrell memo, 9/16/82 which authorized acceptance of all as-built cable tray support fillet welds known to have been made prior to February 6, 1982 without inspections. "Per Cantrell's memo 9-16-81" shall be written on card as justification. Fillet welds known to have been made after February 6, 1982, will be inspected and dis-positioned in accord with applicable QCP's.

March 29, 1982. Wilkins to Rankin re NCR 3579(?) and 2375R re Rankin's March 1 memorandum. Takes exception to Rankin having claimed NCR 2375R was limited to platforms, ladders and stairs or to fillet welds. Wilkins said it applied to other structural steel items and fillet welds. If scope is to be narrowed, Wilkins would insist on additional NCRs.

April 5, 1982. Austin to inspectors cites NCR 2375. WHERE IS THIS MEMORANDUM?

May 5, 1982. Standifer to Wilkins re weld sampling program per NCR's 3579 and 2375R. Lists attributes for which welds should be examined, including cracks, porosity lack of fusion, etc.

June 3, 1982. MAJOR MANAGEMENT REVIEW OF WATTS BAR NUCLEAR PLANT - NSRS R-82-02-WBN. NSRS states that it had not found "any evidence to indicate" that TVA had sought NRC approval of its having conducted its welding QA program in a manner less stringent than American Welding Society (AWS) Code D1.1-72 to which TVA had committed. NSRS also stated that it believed that TVA's relaxed interpretation of welding QA requirements at Watts Bar "has the potential of becoming a significant problem in the event the NRC does not approve relaxation of the AWS Code requirements." SEE 11/25/82; 8/8/83.

The June 3 report indicates specific examples of TVA's requirements being less stringent than those implicit in D1.1. The examples included: maximum and minimum weld size; fillet

weld configuration; fillet weld undercut; weld splatter; arc strikes; acceptability of inspections performed following application of carbo zinc primer; and the type of inspection (and related documentation) necessary prior to final visual examination. [The findings with regard to AWS D1.1-72 should not have surprised TVA managers since a TVA construction manager in a memorandum (WBN 800822006) dated August 22, 1980 requested an engineering evaluation for relief from AWS D1.1-72 which appear "overly restrictive" and have had a "severe impact on Watts Bar Nuclear Plant's schedule and cost."] The June 3 report was transmitted with a cover memo from H.N. Culver, Director, NSRS to G.H. Kimmons, Manager of Engineering Design and Construction. The cover memo stated: "We believe the number and significance of many of the identified deficiencies make it necessary that an in-depth review be performed of one of the safety systems to assure TVA management that Watts Bar has been designed and constructed in accordance with the applicable requirements." WAS THIS IN-DEPTH REVIEW PERFORMED? WHAT WERE THE RESULTS? DO THEY MEAN B&V? DID B&V LOOK AT WELDS?

June 3, 1982. NSRS to Kimmons re R-82-02-WBN-24. Structural welding (cable tray supports, conduit supports, instrument tubing supports, piping supports, etc.) had not been accomplished in accordance with all the requirements of the AWS-D1.1-1972 welding code. Recommendation: EN DES should provide technical justification for all of the specific AWS-D1.1 code deviations and should obtain written approval from the NRC to allow for these less stringent requirements." WHAT HAPPENED? (See 8/20/82.) NOTE: AWS PROCEDURES NOT ESTABLISHED TWO YEARS AFTER SIGNIFICANT PROBLEMS HAD BEEN DOCUMENTED?

June 16, 1982. Wadewitz (WB PM/CONS) to Standifer (SQN and WB Design Projects Manager) re Status of Weld Sampling Program per NCR 2375.

June 18, 1982. Prepared for presentation to NSRS by Pierce and Jesse: EN DES changes to design process, specifications and licensing commitments made to accommodate fabrication latitude requested by CONST. Contains chronology of events leading to new design requirements and licensing changes now in progress. WHAT LICENSING CHANGES WERE MADE? WAS PRESENTATION ACTUALLY MADE? WHAT WAS RESULT?

June 23, 1982. WATTS BAR NUCLEAR PLANT - INSPECTION PRACTICES OF STRUCTURAL STEEL WELDS - SPECIAL REPORTS NSRS R-82-07-WBN. Report concerns inspection of SS welds through paint. Suggests small number of welds inspected through paint. Source says actual number was in thousands.

Sometime during 1982, NSRS staff prepared a detailed comparison of the requirements of AWS D1.1-72 and and G-29c. (See App. .)

July 16, 1982. BN NCR 1888. Cover memo from Gilbert states that the NCR is considered to be a significant condition adverse to quality. Evidence exists as a result of NCR 1173 investigation that some of the 1/4 inch and larger fillet welds required on features in above item description have been found to be undersized where visual inspections were made prior to mid-1980.

July 23, 1982. Kimmons to Willis. Changes were made to ASME Section III which will permit more realistic acceptance criteria for welds. These changes involve sizes and tolerances; they provided a basis for acceptance of similar conditions on non-ASME welding. The latitude provided by changes significantly reduced time required to visually examine welds and allow acceptance of minor geometrical surface conditions which previously required rework and reexamination. Code changes will result in "our not spending possible \$5 to \$30 million at WB. Additionally a cost saving will be realized from future construction and maintenance. WERE THESE CHANGES APPROVED BY NRC? IF SO, BY WHOM AND ON WHAT DATE?

August 4, 1982. Culver to Willis. States NSRS support for OEDC requested change from commitment to AWS to ASME "since the requirements of the ASME Code are more appropriate to cover the structural welds." WAS THIS CHANGE IN COMMITMENT SOUGHT FROM NRC AND WAS IT APPROVED? IF SO, WHAT ARE THE RELEVANT DATES?

August 16, 1982. Culver to Willis. GNS 820816 050. States that TVA procedures do not required NSRS review of changes proposed to codes committees.

August 18, 1982. See August 26, 1982 re closure of BN-W-80-08 etc.

August 20, 1982. Attached to 12/22/82, Kimmons to Culver. States that EN DES task force had addressed problems. As a result TVA construction specs have been revised. SAR revisions were initiated and sent to NEB. "This approach was discussed by phone with NRC prior to initiation of the effort. It was confirmed that this was not a new approach." WHAT DOES THIS MEAN? WHO TALKED TO WHOM, WHEN, AND WHO CONFIRMED WHAT? "The SAR revisions will be submitted to NRC in revision 47 expected to be released September 10, 1982. NRC will process revision 47 as they have processed previous revisions." [Note: REVISION 47 SUBMITTED JANUARY 4, 1983. WHERE IS THE TF REPORT?]

August 24, 1982. Beasley to Sprouse re AWS design and inspection. Memo states that response to BN-W-80-08 committed to a welding design guide and that the guide had not been issued. Beaseley said he had been informed by Jesse that guide was no longer necessary due to EN DES EP-4.25 being revised to cover the situation. Beasley said if it were EN DES position that the design guide was no longer needed, then the commitment

to issue it should be rescinded and documented. WAS DOCUMENTATION COMPILED?

August 26, 1982. Inspection Report 439/82-23 states that item 439/80-22-02 was closed on basis of information provided by TVA in June 22, 1981 letter to R-II. "The report has been reviewed and determined acceptable. In their report, the licensee concluded that had the reported deficiency gone uncorrected it would not have adversely affected the safe operation of the plant. The inspector discussed the item with responsible licensee representatives and reviewed the documentation to verify that the corrective actions described in the report have been completed. [WHAT DID NRC DO TO VERIFY THAT PROBLEM HAD BEEN ADEQUATELY ADDRESSED, INCLUDING DEFICIENCIES THAT MIGHT HAVE ARISEN WHEN PROCEDURES WERE INADEQUATE? WHY 14 MONTH INTERVAL BETWEEN RECEIPT OF JUNE 22 LETTER AND CLOSING OF ISSUE?]

September 2, 1982. BN NCR 1968. Evidence exists as a result of BN NCR 1173 and BN NCR 1888 investigations that some of the welding workmanship, on item description features, does not meet all of the inspection criteria specified in G29c. Currently, determination of the time frame in which these nonconforming welds were made has not been established but will be determined during the course of investigation. Apparent cause: Inadequate training of weld inspectors with respect to visual examination. [NOTE: See entry of October 10, 1980 re examination of weld inspectors.]

September 8, 1982. NSRS to OEDC. GNS 820909 051. NSRS says OEDC response to R-82-07 WBN -06 is not adequate. NSRS says three viable methods to justify the position that welds could be inspected through carbo zinc: exception to code, demonstrate inspectability through carbo zinc, reinspection per ANSI N45.2 Section 11, Inspection. WHAT WAS DONE?

October 7, 1982. McDonald (Quality Improvement Staff to Qual Improvement Files) re October 1 conversation with Dr. Davis, AWS. Davis does not believe that cracks in the minimum detectable visual range (and unacceptable) would be detected through opaque primer (5 mils) rather than bridged over. "I told him I would call him with feedback if TVA could justify detection. He said he would be surprised if we could justify detection through carbo zinc."

October 12, 1982. Standifer (SQN/WB Design Projects Manager) to Wadewitz (WB CONS PM) re weld sampling per NCR 2375R. Presents overall results of sampling program with relatively few details. Finds 4.5% of 14,743 inches of inspected weld to be unacceptable. [NOTE: WHAT DOES THIS MEAN? WHAT WERE THE DETAILS OF THE FINDINGS? HOW MUCH REWORK WAS REQUIRED? HOW MUCH WAS THE NRC INVOLVED IN THIS?] Standifer says: "An overview of the welding program as a whole indicated numerous cases where welders

and welding inspectors were either unsure of the drawing size requirements or did not care what they were."

December 10, 1982. Further elaboration upon above.

December 15, 1982. G.H. Kimmons to H.N. Culver: "Technical Justification of Contrasts of AWS D1.1-72 and General Construction Specification." (EDC 811215 004 sic? 821215 004.) NOTE: THIS MEMORANDUM EXPLAINS WHY THERE WERE NO DEVIATIONS FROM CODE. REFERENCE IS MADE TO THIS MEMORANDUM IN CULVER'S AUGUST 10, 1983 MEMORANDUM TO ANDERSON, MANGER OF QUALITY ASSURANCE. Contrast 1 states that welds made prior to November 21, 1981 may be visually examined without removing primer. The Technical Justification for "This item is being handled separately. It is not discussed here per the request of J.A. Crittenden." (August 1985 QTC report (P.D-9/28) refers to Contrast No.1 re inspection through paint. QTC states that technical justification for "contrast" was not discussed per request of NSRS (sic OQA?). QTC states "The technical justification [for this deviation, ie. inspecting through paint] is not stated in this document or any later TVA document; refer to QTC Finding 18." SEE ALSO ATTACHMENT B, p. 14/14. NOTE: MEMO ADDRESSES WELD CHARACTERISTICS AS OPPOSED TO FILLER MATERIAL, FITUP, ETC.

On January 4, 1983, TVA licensing officials revised TVA's commitment to AWS D1.1-72. by stating that TVA's commitment is in compliance with D1.1-72 as modified by TVA's procedure G-29C.(Att 7, p.2.; Att. 11, p.2.) [Note: It appears that the NRC agreed to TVA's belated revision of its commitment. It is unclear what review, if any, was performed by NRC prior to its concurrence in the proposed change. Although NRC may have determined that the change in the commitment vis-a-vis AWS D1.1-72. was acceptable, NSRS staff did not agree.]

January 12, 1983. WBN NCR 4575R. Supports are fabricated and installed using welds which have not been inspected or documented. Apparent Cause: The site procedure QCP-4.10-2) for inspection of these supports does not require weld inspection or documentation. NCR form states problem was not generic, that it was unique "fabrication/installation welds." WHAT DOES THIS MEAN? "This discrepancy is unique to this Watts Bar site procedure."

January 27, 1983. James Crittenden (OQA) to Files. "Notes on Meeting to Discuss Deviations from AWS Code." Differences between D1.1 and G-29c: Undercut, Size of fillet welds, length of fillet welds, inprocess inspections (including fitup), documentation of welder qualification and inprocess inspections, etc., control of weld rods. NOTE: MEETING IS HELD TO DISCUSS DEVIATIONS 18 MONTHS AFTER TVA TOLD NRC ON JUNE 22, 1981 THAT THERE WERE NONE, 5 MONTHS AFTER TVA'S EXPLANATION HAD BEEN ACCEPTED BY NRC ON AUGUST

26, 1982, AND 3 WEEKS AFTER TVA HAD REVISED ITS COMMITMENT TO AWS D1.1. HOW DID CRITTENDEN ET AL. RESOLVE THE QUESTIONS?

April 11, 1983. 83-05 refers to verifying fitup etc. of safety related structures and supports outside containment. States applicable work is done pursuant to ASME B&PV code when in fact structures are via D1.1. Furthermore, fitup inspections are not done. IS THIS CONSISTENT WITH PREVIOUS FINDINGS RE FITUP ETC?

May 6, 1983. (OQA 830506 002?) apparently accepts December 15, 1982 Technical Justification of Contrasts of AWS D1.1 and G-29c. [QTC notes in Finding 18, that the December 15 "Technical Justification" does not contain a justification for the code deviation involving carbo zinc.]

May 19, 1983. Anderson to Kimmons re R-82-07-WBN. Accepts closeout of 01,02,03,05. TO WHAT EXTENT HAS NSRS, NRC, OR QTC INQUIRED INTO ADEQUACY OF CLOSEOUT OF THESE ITEMS?

June 1, 1983. Mills (TVA Licensing Manger) to O'Reilly re closeout of NCR 2375R and other NCR's including fillet welds on socket weld fittings (e.g. 34,000 inspected, 11,500 repaired).

June 20, 1983. WB NCR 4573. Quality of welding [structural steel in main steam valve rooms] is not in strict compliance with drawing and specification requirements. This structural steel ha minor discrepancies which deal with joint and weld configurations. Welding was previously accepted but not inspected with strict adherence to visual inspection requirements of G-29c. Root Cause: Prior to 1-1-80 strict adherence to weld inspection criteria and a lack of knowledge about commitments to drawing configuration yielded a breakdown in quality. NOTE: WHY WERE WELDS ACCEPTED ON THE BASIS OF MORE STRINGENT CRITERIA THAN THOSE LATER USED AS BASIS FOR REJECTION. NCR was resolved on basis of criteria used in resolving NCR 2375. NOTE: IT SEEMED ONE REASON FOR THE 2375 CRITERIA WAS THAT THE WELDS INVOLVED WERE ON RELATIVELY UNCRITICAL ITEMS. WHAT ANALYSIS HAS BEEN DONE BY NRC?

June 21, 1983. Kimmons (OEDC) to Anderson (OQA): "Watts Bar Nuclear Plant - Resolution of NSRS Recommendation R-82-07-WBN-06" states: The qualification tests substantiated that weld size etc. but not quality. "OEDC has not interpreted G-29C as permitting acceptance of weld quality based on an inspection through primer." "The qualification tests did not substantiate a practical method of visual inspection of weld quality through primer in a construction environment." (See Att 7.)

July 27, 1983. Anderson (QA) to Kimmons (EN DES). [QTC Ref. 34.] OQA response to R-82-02-WBN-24; i.e. OQA notes its acceptance of closure of this item. [Note: Again, reference is

made to the December 15 Technical Justification memorandum which did not address the carbo zinc issue.]

In July 1983, NSRS staff prepared a draft memorandum to TVA's manager of Quality Assurance stating that some of the deviations from AWS D1.1-72 had not been adequately justified by the TVA officials responsible for doing so or for making sure that the appropriate corrective action was taken. One draft stated: "Our recommendation was (referring to the NSRS review) that these deviations be identified, justified and approved by the NRC. .... It appears that ENDES (Department of Engineering Design and Construction) is trying to hide these deviations from the NRC."

August 8, 1983. Verelli (R-II) to TVA. Re NCR 2654R; ie.22% of 245 Aux Building duct supports were found to have unacceptable welds. "The defect found include undersized welds, incomplete welds, slag inclusions, porosity, and overlap. TVA has reevaluated the subject deficiency. As a result, an alternate criteria has been established by TVA for the visual inspection of fillet welds instead of the requirements of AWS D1.1. ... The aforementioned corrective actions meet the requirements of the AISC Specification for the design, fabrication and erection of structural steel for building. The Licensee stated that the FSAR had been changed to reflect the change in inspection criteria for HVAC supports." DID NRC REVIEW THE NEW INSPECTION CRITERIA? WHERE IS SUCH REVIEW DOCUMENTED? SEE 1/25/82.

August 10, 1983. This is the final version of the foregoing memorandum (GNS 830811 050). It addresses carbo zinc, verification of weld filler material, and inspection recores. NSRS says that some of the OEDC technical justifications (cited in the December 15, 1982 memorandum) are not adequate, and deserve further consideration. NSRS pointed to an inconsistency between the acceptance criteria which required welds to be free of cracks and the inspection procedure which allowed inspection through paint. NSRS stated: "We recognize that the general problem of the application of carbo-zinc prior to weld inspection is being handled by OQA as a separate issue and may have influenced the decision to close this item." NSRS said the justification for lack of records to trace weld filler material appears to be inadequate. "...a program to determine the chemical and physical properties of a representative sample of the welds may be necessary to establish the acceptability of the filler material." "...documentation verifying that inspections had been performed and the results of the inspection are not available for welds prior to July 1982." [NOTE: ASSUMES AWAY PRE-1982 PROBLEMS; NO OBJECTIVE EVIDENCE TO BACKUP THIS ASSUMPTION. NSRS MEMORANDUM NEVER ADEQUATELY ANSWERED.]

August 24, 1983. Anderson (OQA) to Kimmons (ENDES) says all required inspections cannot be accomplished via inspections through primer. The WB site has not identified any welds

inspected through paint. OQA appears to accept closeout of carbo-zinc issue. WHERE DOES NRC, NSRS, AND QTC STAND ON THIS?

October 13, 1983. Dilworth (Asst GM) to Anderson (Dir/OQA) says resolution of AWS problem dragging on too long. [Note: Dilworth is concerned that AWS problem has not been resolved, when TVA told NRC on June 22, 1981 that it had been resolved; NRC had accepted TVA's resolution on August 26, 1982; and TVA submitted Amendment 47 on January 4, 1983.]

October 20, 1983. TVA OQA Manager Anderson wrote a memorandum to the Director of the NSRS Culver stating that he considered the carbo zinc matter closed via closure of R-82-07-WBN-06. "OEDC has not documented any inspections through carbozinc primer. The welds which were inspected through carbozinc primer were identified by the responsible inspectors and were reinspected and documented after the carbozinc primer was removed." DOES QTC AGREE WITH THIS? "It is our opinion that the welding program as outlined in G-29c yields a quality product if properly implemented;" and that "Our licensing commitment has been properly modified through the FSAR amendment." Note Item 2C: "The FSAR for Watts Bar was revised by amendment 47 dated January 4, 1983 to state that our commitment is [sic] compliance with AWS D.1.1-72 as modified by G-29C. To date, the NRC has posed no questions in this area. We believe that questions would have been raised by now if there were any to be raised." Item 3B: "The records of the final weld inspections are contained in the appropriate inspection procedure for the various components. CONST at WBN uses one procedure to perform and accept the weld inspection and numerous other procedures to document the results." [NOTE: Anderson memorandum ignores NSRS August 10 memorandum pointing to inconsistency between regulations prohibiting cracks and allowing inspections through paint which would not detect cracks.]

October 20, 1983. Kimmons to Willis. Attaches summary of events. "Note that the 'bottom line' is that NRC and NSRS have closed the structural welding issue (page 4 of summary)." IS IT A FACT THAT NSRS AND NRC HAD CLOSED THE ISSUE AS OF THIS DATE? First item re 6/11/80 NCR 2375R and 6/18/82 Pierce/Jesse briefing paper both of which stated reinspections showing that previously inspected welds had not met requirements for visual examination was changed in the 10/20/83 chronology to may not meet requirements for visual examination. With respect to 9/09/81 entry: "Following conversations with cognizant NRC personnel in Atlanta and Bethesda, TVA initiated changes by licensing transmittal 327 to Regulatory staff in Chattanooga. Change was submitted to NRC in revision 47 to SAR. Attachment 5c shows present SAR with Rev. 47. Note: these same changes in commitments have also been made on FBNP and BLNP; and, to date, no questions or comments have been received from NRC." [Note: Underlined portion presumably refers to contemporaneous (e.g. 10/83)

understanding. On page 4 of summary, re 10/7/83: NRC inspectors performed evaluation of welding within scope of nonconformances NCR 2375R and NCR 2111R and NSRS Finding R-82--02-WBN-24 and closed the items on October 7, 1983. NCR 2375R and NCR 2111R were closed by OEDC on April 22, 1983 and April 18, 1983 respectively.]

October 25, 1983 (circa). Handwritten notes re inspectors recollections as to inspection of welds through paint. File CS 10.1.

October 28, 1983. OQA/NSRS meeting re R-82-02-WBN-24 which found that structural welding had not been conducted in accord with all AWS D1.1 requirements. OQA meeting memo (dated 11/18/83) stated OQA would develop a factual history of OEDC actions to resolve problems with integrity of welds; OQA will evaluate adequacy of corrective actions. WHAT HAPPENED? WHERE IS THE OQA FOLLOWUP? NSRS meeting memo (dated 11/28/83) stated "The purpose of the meeting was to discuss the resolution of safety issues relating to the inspection of welds through carbozinc and maintenance of weld inspection records. ... On the issue of inspection of welds through carbozinc primer it was decided that further study was warranted including a determination of whether a sampling program had been conducted and documented." NOTE: QTC SAYS OQA HAD CLOSED THE ITEM ON 5/6/83; AND NSRS WAS NOT ON THE DISTRIBUTION LIST OF THE OQA MEMORANDUM.

November 20, 1983. QTC (p.D-19/28) states that OQA/SEB memo to NSRS contained a draft evaluation for review prior to a meeting scheduled for 12/21/83. Refers to meeting to discuss NSRS agreement and disagreement re resolution of R-82-07-WBN etc. The overall evaluation section of the memo states: "EN DES evaluated the acceptance criteria specified in G-29c and determined that changes were justified based on current industry standards and practices. The TVA acceptance criteria in G-29c were then revised. These changes were submitted as changes to TVA's commitments to the NRC." QTC notes that none of the attachments to the OQA/SEB memo, including the EN DES CHANGES IN ACCEPTANCE CRITERIA identify inspection through carbo zinc as an exception to AWS or change in commitment.

January 12, 1984. TVA meets with R-II re adequacy of G-29c. R-II memorandum of meeting [see January 23, 1984 below] states that purpose was to discuss the adequacy of TVA's weld filler material control program. "It is to be noted that ASME Class 1 pipe welding (e.g. Reactor Coolant Piping) has traceability as to heat and lot number on the weld joint control documentation." NOTE: TVA STATES THIS NOTWITHSTANDING THAT TRACEABILITY WAS NOT MAINTAINED. At this meeting, NRC "questioned the nature of the TVA TVA commitment contained in the FSAR, and informally recommended that specific exceptions to AWS D1.1-72-1972 be documented." WAS THIS DONE? WITH THIS QUESTION OUTSTANDING,

WHAT IS THE BASIS FOR CONCLUDING THE NRC ACCEPTED THE TVA EXPLANATION?

January 16, 1984. John R. Lyons, Systems Engineering Branch (SEB) to SEB Files describing January 12 meeting with NRC R-II. "The NRC asked several questions regarding the TVA program which we agreed to pursue and to evaluate the need for program improvements. These questions are contained in Attachment 2." ATTACHMENT 2 WAS NOT INCLUDED IN PACKET PROVIDED THE NRC IN CONJUNCTION WITH A MARCH 12, 1985 MEETING WITH NRR IN BETHESDA. ATTACHMENT 2 CONTAINS SEVERAL QUESTIONS AS TO BASIS FOR CONCLUDING THAT WELD ROD NEED NOT BE TRACEABLE TO SPECIFIC WELDS. THE RECORD DOES NOT INDICATE THAT THESE QUESTIONS WERE ANSWERED. NOTE THAT MEMORANDA DESCRIBING MEETING DO NOT REFER TO CARBO ZINC AS BEING ONE OF THE ISSUES THAT HAD BEEN THE FOCUS OF CONTROVERSY. QTC BELIEVES IT WAS DISCUSSED WITH R-II; SEE QTC FINDING 17, P. D-21. SEE ALSO ENTRY BELOW, MARCH 25, 1985.

January 17, 1984. OQA to OEDC recommending deleting provision allowing inspection through paint, and modifying FSAR to identify specific exceptions taken to D1.1. QTC findings state these recommendations "are a direct result of the meeting with USNRC Region II on 1-12-84 .."

January 18, 1984. Briefing of TVA Board. Among issues raised were Filler Material records, inspection records, inspection through paint, and overall acceptability of AWS welds. "A concern was expressed that, if the NRC-NRR did an in-depth evaluation of the exceptions to this end, they might have significant questions that could seriously affect the licensing of the Watts Bar nuclear plant. To satisfy this concern, a detailed exception will be presented to the NRC-NRR." At this meeting NSRS agreed with the TVA Office of Quality Assurance that the problem had been resolved. Written notes of the meeting state: "The Board concluded that TVA should present the NRC-NRR (NRC-Office of Reactor Regulation) with a detailed description of the (welding) program changes and should obtain their concurrence." An added note says: "The Board did not feel it was necessary to obtain this concurrence in writing." [One meeting participant disagrees with the meeting notes indicating that the Board did not think it necessary to obtain the NRC's concurrence in writing; this person recalls that the Board stated that the detailed description should be presented in writing and that a written concurrence should be obtained from the NRC.] The meeting notes state that a report was to be prepared for the TVA Board describing the NRC response to TVA's presentation of a detailed description of and justification for its welding program changes. WHERE IS THE WRITTEN REPORT REQUESTED BY THE BOARD? An attendee at the January 18 meeting who believed the case had not been made that the AWS D1.1-72 problem could be considered resolved later informed investigators that he heard nothing at the meeting that allayed his concern about the unilateral

de-commitment to AWS D1.1-72. This fact and the lack of a documented program verifying work already done at the site was at the heart of his concern. During the January 18 meeting, TVA QA officials stated their acceptance of the resolution of the problem involving weld inspections made following application of paint primer. WHAT IS RESPONSE TO OQA/OEDC. WHAT IS ANSWER TO THEIR CONTENTION RE PAINT PRIMER?

January 18, 1984. GM to GM files: describes meeting with Board. The memo indicated that the Board had been told that the "filler metal records" and "inspection records" issues were presented in terms of "TVA commitments to the NRC", but the "carbo zinc issue" was not presented in terms of what the commitment might be. [From QTC p.D-23/28.]

January 19, 1984. OQA to TVA/GM: OQA and NSRS jointly concluded that the AWS welding program for WBN satisfies regulatory requirements and TVA commitments to the NRC and provides adequate confidence in the integrity of welds made under that program. It is OQA's position that these longstanding concerns have been satisfactorily resolved." WHAT ABOUT COMMITMENT TO D1.1 VIA FSAR 17.2 COMMITMENT TO N45.2.5.

January 20, 1984. OQA to SEB files contains statements about the January 18 TVA Board briefing which are different from the GM's memorandum on the meeting. This memorandum said the Board had told the staff to present NRC a description of the weld program change but not a comparison of D1.1 and G-29c, and that it was not necessary to obtain NRC's written concurrence. The GM's memorandum had a detailed exception to AWS D1.1 with technical justification, to the NRC-NRR and determine if they have any concerns regarding the TVA program.

January 23, 1984. G-29c is changed to delete provisions permitting inspection through carbo zinc.

January 23, 1984. To TVA from R-II "It is our opinion that this (January 12) meeting was beneficial. It provided a clear understanding of the Watts Bar welding filler material program." QTC notes that this letter does not acknowledge any presentation or discussion regarding the carbo zinc issue or inspection of welds through primer as an exception to the AWS D1.1 code.

January 30, 1984. From TVA OQA to TVA/NSRS. Documents closure of NSRS concerns about AWS welding program. LISTS SEVERAL DOCUMENTS. DOES NRC HAVE THEM? NOTE: QTC states: "Review of this memorandum resulted in more unresolved questions than answers, as to the basis for TVA closure of the carbo zinc issue." Attachments B and C of the QTC carbo zinc report are annotated versions of the memo and questions directed thereto.

February 3, 1984. TVA/NSRS to TVA/OQA. NSRS confirms that its AWS concerns have been resolved and closed. QTC comments (p.D-27/28) are to the effect that documents cited in NSRS memo do not support resolution of the NSRS concerns.

February 10, 1984. TVA meets with NRR. TVA's February 17 memorandum stated that TVA provided the background regarding changes made to the AWS code. According to TVA, NRC indicated it had an understanding of the TVA welding program requirements as defined in the General Specs. TVA said that NRC said the designer is allowed by the Code to interpret requirements, and the NRC "consider(s) that TVA has not modified a commitment but has merely provided in the G-Spec implementing instructions as permitted by the Code. Consequently, the NRC has indicated no apparent concern regarding what TVA has done in clarifying requirements for the welding program at WBN. "...NRR representatives indicated .." they had been in discussion with I&E in this matter, and as a result, they had no specific concerns regarding the TVA welding program at WBN. They indicated there was no need for TVA to provide additional information regarding the welding program requirements."

NRC, in its March 1 memorandum describing the meeting, says it was told "there was no technical difference between G-29c and the requirements established by the AISC. ... the NRC staff told TVA that, after a cursory review of GCS G-29c, and the presentation made by TVA, the staff had no concerns with regard to TVA's commitment to AWS D1.1 as it is clarified by G-29c." The NRC said they would provide TVA with a summary of the meeting that will reflect these general conclusions and that the summary will be placed in the public Document Room. NOTE: TVA DID NOT PROVIDE NRC DETAILED COMPARISONS OF G-29C AND AWS D1.1. NOR DID TVA INFORM NRC AS TO EXTENT OF PROBLEMS RAISED BY NSRS. NRC PREPARED ONLY A BRIEF SUMMARY WHICH WAS NOT PLACED IN THE PDR.

Id. With respect to foregoing meeting, QTC notes (p.D-28/28) that:

- (a) GCS-29c was changed on 1-23-84, just prior to meeting to delete references to carbo zinc;
- (b) Only a "cursory review" of GCS G-29c was performed.
- (c) No indication that "detailed exception to the AWS D1.1, with technical justification" was presented to NRC; this as the "Action Item" from the 1-18-84 TVA Board meeting.

March 1, 1984. NRC summary of foregoing meeting; e.g. memo referring to a "cursory review."

August 27, 1984. Vol 30 - No. 35. p. A-3. Commonwealth Edison. S&L commits to D1.1. D1.1 requires that inspector shall

examine work in a way that includes fitups. Contrary to the above, Napoleon Steel Contractors QA program did not require fitup inspections for safety related structural steel; quality control personnel did not inspect and assure acceptable gaps for weld joints. C-E found Napoleon did not have documentation for preheat, interpass, temperature, position, etc.

October 2, 1984. Investigators were shown notes (File CS A22) where one inspector writes to another: FSAR holds to AWS except as modified by G-29c; G-29c holds to AISC; AISC holds to fitup by inspector. "Now What?"

October 29, 1984. BNP NCR 3615 states "Reinspections of several structural items in which previous inspections had been finalized, revealed that portions of the installed items do not meet the requirements of BNP-QCP-2.15 and EN DES drawings. Refer to the attachments for the discrepancies found and drawing numbers. 73% of the total items reinspected failed to meet the requirements. [November 27, 1984 version of NCR 3615 states 54.8% of items inspected failed to meet requirements.] (Refer to NCR# 1888 and NCR#1968 for welding discrepancies previously identified.) Note: these reinspections are general and not all inclusive. Apparent cause: Without further investigations, the cause cannot be accurately determined, however, it appears to be inattention to detail.

November 21, 1984. First interim report on 50.55e re WB substandard welds on RB conduit supports."There is no reason that these conduit support welds (on 55 supports) had previously been inspected or accepted. Due to the number of conduits on these supports, the support welds are inaccessible to rework.

December 19, 1984. NOV Level V. Undersize weld on pipe support resulting from failure to follow QCP 4.23-4. "This was due to an inspector oversight in assuring that the correct weld size was performed. .. This hanger was finalized October 16, 1981. Since that time hanger QC inspectors have been reinstructed on a recurring basis in the acceptance criteria QCP-4.23-4 and other applicable procedures and specifications." NOTE: QCP 4.8 DOCUMENTATION WAS DISCARDED. WHY CONSIDER THIS AN ISOLATED DEFICIENCY? WHAT ABOUT INPO FINDINGS?

March 11, 1985. 439/85-06. Finds inspections being done to requirements of O.C.1.1(RO) when requirements mandate inspections done to requirements of 1.C.1.2(R2). Inspectors were "directed" to inspect AWS welds to O.C.1.1.(RO) which allows substitution of ASME criteria for AISC (AWS??) welds. This "direction" to inspect to O.C.1.1(RO) "mandates automatic non-conformance to BNP-QCP-7.5 (which is the procedure provided to QC inspectors for visual examination of welds.) This is unresolved Item 438. [WHERE DOES IT STAND?]

March 28, 1985. Lyons to Denton re AWS Weld Program. Lyons notes that during the March 25, 1985 meeting in Washington that, "You (Denton) raised a concern of whether or not ..(NRR) .. was aware of the employee concern of this issue when TVA discussed the subject with NRR in 1984." Lyons implies that all issues raised by the employee had been discussed with Region II on January 12, 1984, after which "Region II representatives indicated their full satisfaction with TVA's program and that they were satisfied with disposition of the issues as proposed." NOTE: WHILE R-II BRIEFING CHARTS PREPARED FOR MEETING INDICATE THAT CARBO ZINC WOULD BE DISCUSSED, RECORDS OF JANUARY 12 MEETING DO NOT INDICATE THAT CARBO ZINC WAS IN FACT DISCUSSED NOR THE NATURE OF ANY SUCH DISCUSSION. NOR DO THE NRC'S RECORDS OF THAT MEETING INDICATE THAT: "Region II representatives expressed their full satisfaction with TVA's program and that they were satisfied with disposition of the issues as proposed." The NRC said in its Enclosure 1 of its letter to TVA describing the meeting that: "The NRC made several comments concerning ways to possibly better control the exiting program but did not find any regulatory inadequacies in the program as described by TVA. The NRC did concur that the weld filler material program described as being in place at Watts Bar would be acceptable in the AWS D1.1 welding program." The NRC's qualification, "as described by TVA", raises question as to whether NRC would have expressed satisfaction with the program and disposition of issues had Region II known the full circumstances of the controversy.