



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA STREET, N.W.  
 ATLANTA, GEORGIA 30323

Report Nos.: 50-390/85-56 and 50-391/85-45

Licensee: Tennessee Valley Authority  
 6N11 B Missionary Ridge Place  
 1101 Market Street  
 Chattanooga, TN 37402 - 2801

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar Units 1 and 2

Inspection Conducted: July 31, August 6-8, 14-16 and 22, 1985

Inspectors: G. J. Dignatous  
 for J. W. York

10/25/85  
 Date Signed

G. J. Dignatous  
 for M. B. Shymlock

10/25/85  
 Date Signed

Approved by: S. P. Weise  
 S. P. Weise, Section Chief  
 Division of Reactor Projects

10/25/85  
 Date Signed

SUMMARY

Scope: This special, unannounced inspection entailed 64 resident inspector-hours on site in the areas of code requirements, review of procedures, methods of procedure implementation, and interviews with welders and craft foremen.

Results: One violation was identified - Failure to Follow Procedures for Renewing Welder Performance Qualification.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*R. Pierce, Project Manager, WBNP
- \*G. Wadewitz, Construction Project Manager  
and various members of his staff
- \*R. Sauer, Compliance Manager
- \*J. McDonald, Compliance Manager
- \*D. Terrel, Licensing Engineer, Chattanooga
- \*J. Ritts, Licensing Engineer, Knoxville

Other licensee employees contacted included weld quality control personnel, construction craftsmen, and technicians.

#### Other Organizations

- \*D. Verrelli, Branch Chief, USNRC, Region II
- \*S. Weise, Section Chief, USNRC, Region II
- \*J. Blake, Section Chief, USNRC, Region II

#### NRC Resident Inspector

- \*W. Holland, Resident Inspector

\*Participated in telephone conference on August 26, 1985, in which results of the special inspection were summarized.

### 2. Exit Interview

The inspection scope and findings were summarized in a telephone conference on August 26, 1985, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

### 3. Purpose of the Inspection

As a result of employee concerns brought to NRC's attention, this special inspection was conducted to review the implementation of the welder performance qualification program. The inspectors evaluated the licensee's program for implementation of the American Society of Mechanical Engineers (ASME) and American Welding Society (AWS) requirements for maintaining welder performance qualifications of site welders. This inspection also reviewed a concern about backdating of welder qualification cards.

#### 4. Code Requirements for Renewal of Welder Performance Qualifications

The inspectors reviewed the applicable code requirements for renewal of welder performance qualifications.

- a. The following requirements for welder qualification renewal are from ASME Section IX, Welding and Brazing Qualification, 1983 edition:

##### QW-322 Renewal of Qualification

The performance qualifications of a welder or welding operator shall be affected under the following conditions: (a) when he has not welded with a process during a period of 3 months or more, his qualifications for that process shall be expired; except when he is welding with another process, the period may be extended to 6 months; (b) when he has not welded with any process during a period of 3 months, all his qualifications shall be expired including any which may extend beyond 3 months by virtue of (a) above; (c) when there is a specific reason to question his ability to make welds that meet the specification, his qualification, which supports the welding that he is doing, shall be considered expired.

Renewal of qualification for a specific welding process under (a) or (b) above may be made in a single test joint (plate or pipe) on any thickness, position, or material to reestablish the welder's or welding operator's qualification for any thickness, position, or material for the process for which he was previously qualified.

- b. The following requirements for welder qualification renewal are from AWS D1.1-81, Structural Welding Code, Section 5.30, Period of Effectiveness:

The welder's qualification as specified in this code shall be considered as remaining in effect indefinitely unless (1) the welder is not engaged in a given process of welding for which he is qualified for a period exceeding six months or unless (2) there is some specific reason to question a welder's ability. In case (1), the requalification test need be made only on material 3/8 in. (9.5 mm) thick.

The established industry practice for maintenance of performance qualifications is that the welders demonstrate the ability to weld with the process in question on a periodic basis. The demonstration may be in the form of documented or witnessed production welding or in the form of a demonstration of the ability to weld on a plate in a test booth. The codes do not specify acceptance criteria for qualification maintenance welding.

5. TVA Document Requirements for Renewal of Welder Performance Qualification

The inspectors reviewed the applicable TVA documents which implemented the code requirements for renewal of welder performance qualification.

- a. The following requirements for welder qualification renewal are from TVA General Construction Specification G29M, Process Specification for Welding, Heat Treating, Nondestructive Examination, and Allied Field Fabrication Operations. This specification provides implementing requirements for welder qualification renewal and is TVA's upper tier document for ASME Code welding.

Section 4.0 Renewal of Qualification (Process Specification 1.M.2.2, Rev.3)

Renewal of qualification of a performance test shall be required under the following conditions:

- (1) Where the welder or welding operator has not used the welding process (manual, shielded metal arc, gas tungsten arc, etc.) to weld either ferrous or nonferrous materials for a period of three months or more, except when employed on some other welding process, the period may be extended to 6 months.
- (2) When there are specific reasons to question the welder or welding operator's ability to produce welds that meet the specification requirements.

- b. The following requirements for welder qualification renewal are from TVA General Construction Specification G29C, Fabrication, Welding, and Examination Specifications and Procedures and are the guidelines for AWS Code Welding.

Section 4.0, Renewal of Qualification (Process Specification 1.C.2.2, Rev. 1):

Renewal of qualification of a performance test shall be required under the following conditions:

- (1) When the welder has not used the welding process (manual shielded metal arc, gas tungsten arc, etc.) for a period of 6 months or more.
- (2) When there is specific reason to question the welder's ability to produce welds that meet specification requirements.

- c. The following requirement for verification of welder performance qualifications are from the TVA ASME Section III Quality Assurance Manual:

Section 5.1 Welding Control paragraph 2.2.1.b.(6) Rev. 20:

The Welding Engineering Unit (WEU) is responsible for preparing and inserting Welder Qualification Verification cards in the Welder Qualification Verification file and maintaining quarterly verification of performance qualifications and preparing a list of all welders with qualifications for each.

- d. The following site requirements for verification of welder performance qualifications are from TVA Watts Bar Nuclear Plant (WBNP) Quality Control Instruction (QCI) -4.02, Rev.4 (dated 6/27/84) Welder and Welder Operator Performance Qualification.

Section 6.4, Verification and Renewal of Qualification (paragraph 6.4.1.2):

The WEU is responsible for verifying through field observations from the quality control units, by review of quality assurance records, or witnessing use of processes in test facilities, that welders and welding operators maintain their performance certification by using the specific process for which they are qualified.

6. Site Method for Implementing Procedures for Renewal of Welding Performance Qualifications

At the time of the inspection, Watts Bar had approximately 600 personnel carrying Welder Qualification Cards (TVA Form 10368), which indicated that these personnel had maintained their qualification in specific welding processes. During discussions with WEU, it was noted that approximately 400 welders actually performed welding. Therefore, approximately 200 welders were not welding on a routine basis. Approximately 75 percent of the qualified welders hold ASME qualifications, and 25 percent hold AWS qualifications. An ASME qualification in a welding process will normally qualify the welder for the same AWS welding process, however, the reverse is not true.

During the inspection, two systems were in place for renewing welder performance qualifications. One system requires the welder to perform welding in the WEU lab or test area, however; few of the certified welders use this method. The second system was to have Weld Quality Control (WQC) renew the welders qualification. This system was the most used. WBNP QCI-4.02 paragraph 6.4.1.2, allows the WQC unit to renew the welder's performance qualification by verifying one of the following: by observing field welding, by using quality assurance records for welding, or by observing the actual use of the welding process in test facilities.

The welder's performance qualification process is as follows: A welder brings his welder qualification card to WQC to have his welding performance qualification renewed. QCI-4.02, paragraph 6.4.1.2 requires the authorized WQC inspector to ascertain that the welder had performed welding in the specified welding processes using one of the three methods listed above. After WQC verified that a particular welder's welding performance could be renewed, the individual's name is placed in the WQC log. The WQC inspector then dates and initials the welder's qualification card. This indicates that the welder qualification is good for another 90 days. The updated WQC log gets sent to WEU, and the Welder's Qualification Verification file should be updated. The welder can then use his welder qualification card as authorization for drawing weld filler material to perform assigned welding activities. This program, if properly implemented, meets code requirements.

#### 7. Interviews with Personnel Holding Welder Qualification Cards

The inspectors obtained a list of all of the current steamfitter craft foremen that currently hold or have held welder qualification cards from WEU. The steamfitter craft was chosen because of work performed on ASME Code piping and on AWS hangers and supports. From this list, the inspectors randomly selected seven craft foremen (four from the piping section and three from the hanger section) for interviews. Six of the seven craft foremen had welder qualification cards and one craft foreman's qualification had expired on June 4, 1985. The inspector examined the qualification cards and asked all seven craft foremen if they had welded or struck an arc for their last welding performance renewal. The following table summarizes the results:

<u>Welder ID (Stencil)</u>	<u>Renewal Date</u>	<u>Did Strike An Arc Or Weld For Updating</u>
6PL	6/6/85	No
6AJJ	6/25/85	Yes (welded in field)
6MB	6/21/85	No
6CM	Ran out 6/4/85	No (for previous updating)
6MC	5/23/85	No
6FFT	6/4/85	Yes (observed by WQC)
6EV	7/8/85	No

All of the craft foremen had their qualification renewed for ASME Code welding by WQC, and the NRC inspectors noted their names and dates on the WQC log sheets.

The inspector also interviewed a welder who was not a craft foreman (Welder A) about renewal of welder qualification. Welder A stated that he had not welded or struck an arc in over a year and yet his card was renewed quarterly for ASME qualification. Welder A stated that he took the welder qualification card to WQC, and it was renewed with no questions asked about whether he had performed any welding. The above examples constitute failure

by WQC to follow procedure QCI-4.02, paragraph 6.4.1.2 and is a violation (390/85-56-01 and 391/85-45-01, Failure to Follow Procedure for Renewing Welding Performance Qualification). Although neither Welder A nor any of the five craft foremen had performed any welding, the potential existed that an unqualified welder could perform welding based upon the licensee's improper implementation of the program. This violation is based on ASME welder performance qualification renewal, but also casts doubt upon the adequacy and accuracy of AWS welder performance qualification renewals.

During discussions with WQC concerning performance qualification, (either AWS or ASME), WQC personnel indicated that they called hanger QC personnel to obtain current welding information on AWS welders. Hanger QC personnel verify performance of AWS hanger welding. If WQC received information from hanger QC indicating active welding in the appropriate process, they dated and initialed the welder qualification card. This practice of obtaining information through verbal means does not appear to be in compliance with procedure requirements. This will be examined further in subsequent inspections and is considered an Unresolved Item 50-390/85-56-02 and 50-391/85-45-02.

During discussions with welding personnel, a concern was raised that the date written on the card was not the date that the welder took his card to WQC. This raised the question about "backdating" of the qualification cards. Several interviews with welders and craft foremen were conducted, resulting in the identification of three occurrences in which the welder qualification cards were backdated from two days to two weeks. In one case the welder stated that he did not even draw any welding rods on the date placed on his card. Current procedures require WQC personnel to determine if the welder actually performed welding using the specific welding processes during that renewal period. Therefore, the date that is written on the welder's card (by WQC) may not be the date he submitted his card for renewal. The inspectors determined that the actual renewal date may not be documented. The renewal date could be the date that someone in WQC thought he saw a particular welder using the process and may not always be accurate. This practice of using undocumented WQC observations rather than objective evidence to update welder qualification is unacceptable in that it can be and has been, inaccurate. The inspector found no ASME Code violations associated with welders whose cards were backdated, since they did perform welding operations. However, the licensee's administrative controls to ensure accurate dates for renewal of welder qualification is inadequate; the lack of objective evidence for welder qualification renewal is a further example of the violation described above.

It should be noted that WQC conducts surveillance inspections of in-process welding on a sampling basis which could provide objective evidence for maintenance of welder qualifications.

#### 8. Confirmation of Action Letter (CAL)

The results of the above inspection called into question the accuracy of records documenting maintenance of welder qualification, and subsequently, the qualification status of welders performing safety-related welding

activities. It also raised questions concerning the reliability of personnel involved in inspecting and documenting welder qualification activities. Region II management informed TVA management of the inspection findings on August 23, 1985, and indicated that current conduct of welding activities did not appear justifiable until the adequacy and accuracy of the welder certification program was evaluated by TVA. TVA management issued a stop work order on all construction welding at Watts Bar, and licensee actions needed to resolve the issue were documented in a Confirmation of Action Letter dated August 23, 1985, from Region II to TVA.