

TENNESSEE VALLEY AUTHORITY

KNOXVILLE, TENNESSEE 37902

OCT 21 1985

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

Dear Mr. Denton:

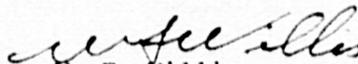
Your letter to me dated September 26, 1985, requested copies of investigation reports and related documents dealing with potentially safety-related employee concerns on TVA's nuclear plants. My letter to you on October 7, 1985, transmitted the information requested which our Nuclear Safety Review Staff (NSRS) had received as of September 30, 1985.

In compiling the requested documents, NSRS inadvertently failed to include a response to an investigation report by Quality Technology Company (QTC). That response, dated September 27, 1985, is provided as enclosure 1. A memorandum providing correction of certain information in the original response, dated October 1, 1985, is included as enclosure 2. These responses relate to QTC investigation report number NS-85-001-001, "Visual Inspection of Structural Welds Through Carbo Zinc Primer," which was provided to you in our October 7, 1985 submittal.

This oversight was due to the fact that this was a unique report, with the response directed to me instead of the NSRS.

If you have questions concerning the contents of this letter or the enclosures, please contact M. S. Kidd at FTS No. 856-2289.

Sincerely,

  
W. F. Willis  
General Manager

Enclosures

cc (Enclosures):

Mr. James Taylor, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. J. Nelson Grace  
Regional Administrator  
U.S. Nuclear Regulatory Commission,  
Region II  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30323

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UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

001 '85 1001 051

TO : W. F. Willis, General Manager, E12B16 C-K

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : October 1, 1985

SUBJECT: NSRS RESPONSES TO QTC INVESTIGATION REPORT, PRELIMINARY REPORT NO. NS-85-001-061 - RELATING TO VISUAL INSPECTION OF STRUCTURAL WELDS THROUGH CARBO ZINC PRIMER

Reference: My memorandum to you dated September 27, 1985 (Q01 850927 051)

The reference memorandum contained two numerical errors in conclusion 7, pages 5 and 6 of the attachment. Please note that the number "36,000" should read 23,600 in both instances in conclusion 7.

*James F. Murdock acting*  
K. W. Whitt

JFM:WCS  
cc: RIMS, SL26 C-K  
H. G. Parris, MR6N011 B-C

KEEP7:C



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UNITED STATES GOVERNMENT

## Memorandum

TENNESSEE VALLEY AUTHORITY

001 '85 0927 051

TO : W. F. Willis, General Manager, E12B16 C-K

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : September 27, 1985

SUBJECT: NSRS RESPONSES TO QTC INVESTIGATION REPORT, PRELIMINARY REPORT NO. NS-85-001-001 RELATING TO VISUAL INSPECTION OF STRUCTURAL WELDS THROUGH CARBO ZINC PRIMER

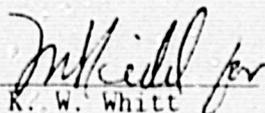
Reference: Your memorandum to me dated August 28, 1985 (Q01 850827 051)

The response to your request in the reference is provided in the attachment to this memorandum. The response involved input from and coordination of a large number of people from OE and OC as well as the NSRS. The help from these people was fully cooperative in nature and in the tone of "let's put this issue to rest once and for all."

In concert with preparation of this memorandum, we have been fully involved in the response to the companion memorandum you sent H. G. Parris requesting a sampling program to reevaluate the quality of the welds at WBN. We are particularly impressed with the positive attitude of all the parties to the responses.

We believe the responses to questions raised in NS-85-001-001 contained in this memorandum resolve any concern of premature closure and inadequate justification for closure of the issue of visual inspection of structural welds through carbo zinc primer. The sampling plan being provided by separate correspondence will resolve any reasonable questions concerning the quality of the structural welds at WBN.

We are available to respond to any further questions you may have concerning this memorandum.

  
K. W. Whitt

JFM:WCS  
Attachment  
cc: RIMS, SL26 C-K  
H. G. Parris, MR6N011 B-C

KEEP7:C



RESPONSE TO ERT PRELIMINARY REPORT NS-85-001-001

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## I. PURPOSE AND SCOPE

The Employee Response Team (ERT) of the TVA employee concern program investigated a concern that TVA had prematurely closed the issue of visual inspection of structural welds through carbo zinc primer at the Watts Bar Nuclear Plant (WBN). This memorandum provides the Nuclear Safety Review Staff (NSRS) response to the ERT investigative report NS-85-001-001 questions and an assessment of the closure process. The memorandum is written in a report format to facilitate presentation and provide a reference basis for any further correspondence.

The scope of this activity was to assess the existence and applicability of documentation which constituted the basis of the NSRS closure of the issue in question.

## II. EXECUTIVE SUMMARY AND CONCLUSIONS

The NSRS evaluated the ERT investigative report NS-85-001-001 which concluded that TVA had closed prematurely and without adequate justification the NSRS identified findings related to visual inspection of structural welds through carbo zinc primer at the WBN. The closure process was evaluated and is discussed in this memorandum.

The NSRS responses to the detailed questions contained in NS-85-001-001 are provided in subsequent paragraphs of this memorandum. The responses are based upon correspondence that existed at the time of closure of the issue in early 1984.

The NSRS principal conclusion is that closure of the issue was not premature and that a satisfactory justification existed to support the closure. A second substantial conclusion is that, as concluded by the ERT investigators, the treatment and resolution of the issue was untimely and unresponsive; however, the final closure resulted from an exhaustive and thorough consideration of the issue and its related facets.

## III. APPRAISAL OF ISSUE RESOLUTION PROCESS

The practice followed in developing (initial identification and substantiation) the issues by NSRS and subsequent reporting to the appropriate line organization management for resolution was the same for the carbo zinc issue as for any other NSRS issues. The issue was developed as part of the R-82-02-WBN management review (although it was not a subject of the exit meeting identification of substantial findings) and was further the subject of a special review, R-82-07-WBN.

The basic issues initially identified by NSRS in mid 1982 were: 1) that inspections through carbo zinc primer had been performed without proper procedures, 2) that documentation to support the qualification of the validity of the inspections was deficient and 3) that deviations from the AWS D1.1 code had not been justified nor had NRC approval been sought or received. The NSRS statements of the concerns were reasonable and clear; however, the supporting detail confused the

issue somewhat. Just what inspections through primer (initial acceptance or reinspection) were the source of the NSRS concerns was not clearly presented in the NSRS reports.

The OEDC initial response to the findings was to deny the alleged problems and set about justifying the technical acceptability of the inspections to NSRS.

Clearly from our current perspective the procedures and documentation were insufficient to support the adequacy of the inspections, technical justification did exist and NRC-NRR had not been informed. However, NRC Region II was informed through the 10CFR50.55(e) reporting of nonconforming conditions. The divergence of the responses from the issues after the initial exchange served only to confuse the issues for both parties.

Resolution of the issue was not timely and the failure of the respondents to converge on the issue of documentation and reporting to NRC was the major factor in not maintaining timeliness. In fairness to the line organization, although NSRS continued to maintain its position on the issues, no particular urgency toward closure was indicated and the transfer of follow-up and closure responsibility to OQA in the winter of 1983 probably delayed the resolution. In several instances, OQA acted to close the issues with OEDC and was challenged by NSRS regarding the appropriateness of those actions. A greater degree of coordination between the two offices could have helped avoid this confusion. Starting in the early fall of 1983, the NSRS/OQA coordination was achieved and the resolution followed in a reasonable fashion.

A complicating side issue contributed considerably to the extended resolution time for this issue. The NSRS had a position and continues to maintain it that when a licensing commitment is not being met or has been modified by TVA, a specific justification for not meeting the commitment should be provided to the NRC for specific review and approval. The line organization has not agreed with this position and continues to disagree. In the case of conformance to the WBN FSAR commitment to meeting AWS D1.1-1972 in the codes and standards section, Amendment 47, TVA inserted after AWS D1.1-72, "as modified by TVA General Construction Specification G-29C." The line organization concluded that the exceptions were within the latitude provided by AWS D1.1 for the engineer and thus TVA was in compliance with the FSAR commitment. The NSRS position was that specific exceptions to AWS D1.1 should be justified to NRC in detail and approval requested for the exceptions to avoid misunderstandings in the licensing process. This difference of views needs to be resolved by TVA management to avoid such conflicts in the future. The degree or level of required communication with NRC needs to be clearly understood at all levels.

#### IV. DETAILS

##### A. Issue Development and Closure Process Reconstruction

The following is a reconstruction of events describing activities leading to recognition of visual inspection of structural welds through carbo zinc primer as an issue and activities after recognition of the issue leading to closure of the concern. Some parts of the reconstruction are deductively concluded from correspondence at the various times and simple logic of what any reasonable person could have done under similar circumstances. It is fully recognized that this reconstruction is not totally rigorous and is done to establish some perspective on the issue. It is not intended that an exhaustive list of all documentation be discussed - only that sufficient to establish the thesis.

In December 1979 and January 1980 deficiencies were noted in structural welds of supports at WBN relating for the most part to weld configuration. The corrective action defined at that time was to improve the inspection procedures, review previous documented acceptances and reinspect previously accepted supports with the new procedure.

In June 1980, a major nonconforming condition report (NCR 2375R) was generated based upon a sampling of cable tray supports, conduit supports, and miscellaneous steel. Substantial fractions of the sampled supports were initially rejectable against G-29 (AWS D1.1) acceptance criteria. The corrective action proposed was to identify each nonconforming weld and repair them to meet the drawing requirements or provide details to engineering for evaluation. A series of memoranda ensued dealing with relaxation of the G-29C acceptance criteria for dimensional considerations or weld configuration with very specific criteria relaxation being granted.

In November 1980 a second major NCR (2654R) was generated based upon a random inspection of 245 duct supports of which 22 percent had unacceptable welds. The defects were principally configurational except porosity was noted. The welds in question had been installed and accepted from January 1976 to March 1980. The corrective action proposed was to reinspect all duct support welds in the auxiliary building made prior to March 1980 and repair them to meet G-29C.

These two NCR's will serve to illustrate the process that occurred and to assess the attendant activities. The NCR's were properly judged significant and were properly reported under 10CFR50.55(e). Further, the NSRS concludes that the disposition actions of reinspection and requests for and granting of specific criteria modifications were properly achieved. As late as November 1983 NRC took closure action on NCR 2375R for WBN unit 1 but stated the item remained open for unit 2.

From 1980 through 1983 an intricate set of OEDC documentation exists which is not all directly referenced to any given NCR; however, it appears that the activity was all aimed at an optimal resolution of the deficiencies identified in various NCR's, including 2375R and 2654R. In the midst of all this

activity, NSRS conducted the major management review of WBN (R-82-02-WBN) and a special review (R-82-07-WBN). These reviews had three findings associated with inspection through carbo zinc primer, R-82-02-WBN-24, R-82-07-WBN-02, and R-82-07-WBN-06. A similar set of documentation to the OEDC set resulted from correspondence dealing with the NSRS findings.

The NSRS reviewers determined, by interviewing inspectors, that visual inspections of welds through carbo zinc primer had been performed. It is not clear that sufficient questions were asked to define whether the welds being inspected through primer were for initial weld acceptance or part of the NCR resolution sampling program. The NSRS report does not differentiate. It is consistent to all documented responses that the welds being discussed by the inspectors were part of the sampling programs.

The NSRS concerns were received at a time when TVA was striving to fully justify the technical adequacy of a very large population of structural welds throughout WBN. The responses to the NSRS findings basically defended the CONST and EN DES programs and disagreed that the programs were deficient in the areas alleged by NSRS.

Records of two sets of sampling program support weld visual inspections have been reviewed by NSRS. These records were provided to NSRS in late 1983 and support a conclusion that the welds inspected through carbo zinc primer were reinspections for configuration only as part of an OEDC sampling program. The records were an essential part of the OQA and NSRS closure of the issue in early 1984. One set of the records are dated July 1981 and recorded inspections for configuration of duct supports and contain notes that the welds were painted in some instances. The second set of records are dated June 1982 and recorded full quality and configuration data for miscellaneous structural steel welds. None of the welds were noted to be painted even though the surface condition was noted in most instances. The NSRS concludes that the July 1981 records were part of the disposition of NCR 2654R and the June 1982 records were part of the disposition of NCR 2375R.

It can reasonably be concluded that visual inspections of structural welds through carbo zinc primer were performed as part of the initial sampling activities for NCRs as early as January 1980. Since the welds had been inspected and accepted prior to the NCR activity, there is no reason to suspect the acceptance was based on inspections of primed welds. Clearly in July 1981 inspections for configuration through primer were performed and recorded. In all probability, in the fall of 1981 someone(s) recalled the prohibition of inspection through paint in G-29C. This led to the request for relief of the requirement which in turn led to the November 1981 and January 1982 EN DES memoranda granting the limited approval. With the possible exception that an NCR or some kind of deviation describing document concerning the inspections through primer which had not been authorized

could have been needed, the above set of events is reasonable and acceptable practice.

It is a fact that the records necessary to totally establish a traceable set of events cannot be resurrected now. The basis of the NSRS recommendations in 1982 was a perceived need for better documentation in procedures and in records. The line organization responded as discussed above and chose to continue to technically justify the acceptability of the practice. This divergence of direction led to the extended correspondence necessary to finally resolve the issue.

An additional observation to help put the carbo zinc issue in perspective is that many relaxations of the geometrical aspects of the weldments were granted by EN DES as part of the NCRs dispositions. The geometrical acceptance criteria are contained in G-29C and as well as AWS D1-1. Although the potential impacts of the relaxations of actual weld geometry are far greater than the impact of some small defect which might be overlooked as a result of examining a painted weld, these relaxations were not challenged because the traceability was more clearly maintained and the justifications were more clearly stated. Therefore one can reasonably conclude, in hindsight, that the issue of inspection through carbo zinc primer might not have been raised had the documentation been more clearly maintained.

Conclusions to be reached from this reconstruction are:

1. Structural welds at WBN were inspected and accepted in accordance with appropriate procedures before they were primed. In no documented case were welds initially inspected and accepted after the primer was applied.
2. A need arose to reinspect some welds for configuration aspects.
3. The primer was not removed from some of the welds being reinspected for configuration - an apparent or alledged violation of existing procedures.
4. CONST requested of EN DES and was granted permission to reinspect for configuration through carbo zinc primer.
5. Some welds were reinspected for configuration through carbo zinc primer both before and after permission was granted.
6. No authorization was ever given by EN DES to reinspect for quality through carbo zinc primer. Any inspections made or initial acceptance or reinspections for quality through primer were made without proper authorization or procedures.
7. Sample programs where reinspections, with the primer removed, for quality were conducted to resolve NCRs. Some 36,000

linear inches of welds with the primer removed were reinspected with zero rejectable defects when reviewed by EN DES. This served as the basis for closure of the item by NSRS. The fact that no rejectable defects were found during reinspection of the 36,000 linear inches of clean welds gave sufficient confidence that the remaining welds were structurally adequate regardless of whether or not they had been reinspected through carbo zinc primer and with or without good procedures.

B. Response to NS-85-001-001 Conclusions

1. ERT Conclusion:

The concern is substantiated.

TVA closed the carbo zinc issue prematurely, and without adequate and documented technical justification and corrective action.

From 1981 to late 1983, TVA's handling of the carbo zinc issue was timely and unresponsive. Then in January and February 1984, TVA questionably dismissed the issue.

NSRS RESPONSE:

The NSRS does not agree that the issue of structural weld inspection through carbo zinc primer was prematurely closed by TVA nor was the issue questionably dismissed by TVA in January and February 1984. Further, the NSRS finds the technical justification was adequate and remains so and the justification is documented principally in the references of the August 13, 1985, Investigative Report NS-85-001-001 which is the subject of this response. The essential parties to the evolution of the carbo zinc issue still work for TVA and still relate facts consistent with that summarized in the January 30, 1984, OQA to NSRS memorandum which captured the major details of the resolution of the issue. The January 30, 1984, OQA memorandum is an acceptable overall summary of the actions and decisions leading to TVA closure of the issue of structural weld inspection through carbo zinc primer.

The NS-85-001-001 report conclusion regarding timeliness and responsiveness of the parties from 1981 through 1983 is correct to a great degree. The NSRS review and resultant concerns as expressed in R-82-02-WBN-24, R-82-07-WBN-02, and -06 could have been more clearly or precisely stated. In turn, the OEDC responses could have requested clarification; instead, the line responses set about justifying the technical acceptability of some inspections through the primer and substantially ignored the documentation issue after the initial response. Once the divergent paths were established, achieving full communication and convergence was

very difficult - the parties simply were not working on the same issue. The NSRS concerns were principally related to documentation of results and controlling procedures; the EN DES and CONST responses principally related to the technical acceptability of the inspections. Convergence was attained in late 1983 and early 1984 through a series of meetings involving OQA and NSRS.

The NS-85-001-001 Attachment C, questions are answered in Section IV.C of this report. The ten "Conclusion" questions are answered in the following paragraphs.

2. NS-85-001-001 - Conclusion Question 1

Does TVA consider inspection of welds through carbo zinc primer a deviation or "contrast" to AWS D1.1-72? If not, why? If so:

RESPONSE:

Inspection of welds through carbo zinc primer is a deviation from AWS D1.1-1972 paragraph 3.10.1 which states "Welded joints shall not be painted until after the work has been completed and accepted." Reinspection of painted welds that were completed and accepted in an unpainted condition is not addressed by AWS D1.1.

It should be kept in mind that inherent in the application of all codes, standards, Regulatory Guides, etc., the ultimate selection and specification of requirements is the responsibility of the engineer or designer to accomplish any design/construct/operate task. In every case, the engineer/-designer specification must be technically justified. In this context, AWS D1.1 is no different than any of hundreds of standards and guides at hand to help the designer; none of the standards or guides are generally 100 percent applicable to a given specification.

The G-29C specification is an engineering specification which relied in part upon AWS D1.1 for a set of technically acceptable requirements. In the same manner that the engineer selected, for ease of specification, AWS D1.1 requirements for G-29C to accomplish specific goals, the engineer can relax or strengthen the requirements consistent with any particular new or different condition so long as technical justification exists. In the case of the inspection through primer, the construction forces properly asked for and were properly granted engineering approval to deviate from G-29C and in turn AWS D1.1 for purposes of reinspecting welds to resolve nonconformances. This process is fully acceptable as an engineering practice.

3. NS-85-001-001 - Conclusion Question 2

Does TVA have a documented technical justification for the above deviation or "contrast"? If not, why? If so, where is it documented, and:

RESPONSE

A documented technical justification exists for performing inspections of structural weld for configuration through properly applied carbo zinc primer. That justification is contained in the December 17, 1981, memorandum from Schrandt to QAB Files (QAS 811217 010) and in the January 14, 1982, memorandum from Cantrell to Wilkins (NEB 820114 253) which superceded the November 2, 1981, memorandum from Cantrell to Wilkins (SWP 811102 056). The documentation may be subject to criticism for its lack of specific traceability regarding the qualification process; however, the need for traceability is highly subjective in nature. Recognizing that AWS D1.1 is not very specific regarding records in general, it is not surprising that traceability which is a subset requirement of records might be subject to dispute.

4. NS-85-001-001 - Conclusions Question 3

Did TVA present and/or discuss the above deviation and/or technical justification to/wi the US NRC Region II at the January 12, 1984 meeting in Atlanta? If not, why? If so:

RESPONSE

The issue of weld inspection through carbo zinc primer was specifically discussed with NRC-I&E Region II at the January 12, 1984 meeting in Atlanta. The meeting is documented in January 16, 1984, memorandum from Lyons to SEB files (OQA 840116 401).

5. NS-85-001-001 - Conclusions Question 4

Did the US NRC Region II, at or as a result of the above meeting, indicate to TVA whether or not the above deviation and/or justification would be acceptable? If not, why? If so, what was the indication and was the indication documented?

RESPONSE

There is no direct indication that Region II either accepted or questioned the inspections in question. However, attachment 2 of OQA 840116 401 documents a set of Region II questions from the meeting which TVA agreed to pursue and evaluate the need for program improvements; the issue of inspection through carbo zinc primer is not addressed in the list of

questions which indicates Region II did not question the TVA practice.

6. NS-85-001-001 - Conclusions Question 5

Did TVA delete the references to such inspection from specification G-29C on January 23, 1984 as a result of the above meeting and a negative response from US NRC Region II? If not, why the deletion? If so:

RESPONSE

Since there was no indication that Region II was questioning the weld inspection through carbo zinc primer, the January 23, 1984 deletion did not result from a negative NRC response.

The parties to the issue - NSRS, OQA and EN DES agreed, at the time, in the interest of removing all residual or lingering questions of misapplication of the engineering granted limited authority to inspect welds through primer, the authority was removed from G-29C. It should be noted that the NCRs resolving sample programs which relied upon the approval had been completed and no longer needed the approval. The deletion in 1984 in no way should be construed to imply the restricted practice in 1981 and 1982 was an invalid exercise of engineering authority.

7. NS-85-001-001 - Conclusions Question 6

At the January 18, 1984 meeting with the TVA Board of Directors, it was decided that specific exceptions to AWS D1.1-72 and associated justifications would be disclosed to the US NRC-NRR; at this meeting, did TVA present and/or discuss the inspection of welds through primer as one of the specific exceptions? If not, why? If so:

RESPONSE

The issue of weld inspection through carbo zinc primer and the related qualification program were specifically discussed in the Board of Directors briefing of January 18, 1984. The summary of the brief is documented in the February 13, 1984, memorandum from GM (Willis) to General Manager's File (EDC 840213 003).

8. NS-85-001-001 - Conclusions Question 7

At the above meeting, was the forthcoming change to specification G-29C (to delete references to such inspection) and/or the reasons for the change, presented or discussed? If not, why? If so:

RESPONSE

Deletion of the G-29C allowed practice of restricted weld inspection through carbo zinc primer was not discussed at the January 18, 1984 Board briefing. Since the deletion was not a key issue and OQA had not requested the deletion at that time, there was no forcing function to provide such a discussion.

9. NS-85-001-001 - Conclusions Question 8

At the February 12, 1984 meeting with the US NRC-NRR in Bethesda, did TVA disclose the above deviation and/or justification? If not, why? If so:

RESPONSE

The subject of weld inspection through carbo zinc primer was not discussed at the February 12, 1984 meeting of TVA and the NRC-NRR in Bethesda. The issue of the weld inspections through primer was felt to be resolved and acceptable based upon data from sampling programs which demonstrated that the weld inspections through primer had been performed for the purposes of disposition of NCRs related to weld configuration. The number of welds which might have been inspected improperly, for weld quality through primer, was estimated to be 100 - 150. Since the NCR disposition results from the extensive sampling had showed no rejectable quality defects, the 100 - 150 welds were felt to be acceptable.

10. NS-85-001-001 - Conclusions Question 9

Did the US NRC-NRR, at the above meeting or otherwise, indicate to TVA whether or not the above deviation and/or justification is acceptable? If not, why? If so, what was the indication?

RESPONSE

The subject of weld inspection through carbo zinc primer was not discussed at the meeting with NRC-NRR. Thus NRC-NRR gave no indication whether or not the practice was acceptable.

11. NS-85-001-001 - Conclusions Question 10

Does TVA consider the "sampling program" re-inspections as inspections subject to specification G-29C and code AWS D1.1-72? If not, why? If so, refer to question 1, above.

RESPONSE

The sampling program reinspections were subject to the G-29C and AWS D1.1-72 requirements to the extent specified by the

engineering designers. The response to question 1 above more fully addresses the engineering specification inter-relationship with codes and standards.

C. Response to NS-85-001-001 Attachment C Questions

1. QID A

STATEMENT

The purpose of this memorandum is to document final resolution and closure of NSRS concerns with the AWS Welding Program at the Watts Bar Nuclear Plant.

QUESTION

Since the "purpose of this memorandum is to document final resolution and closure of NSRS concerns," is it intended that this memorandum address all of the following NSRS findings regarding the carbo zinc issue:

- (a) NSRS item R-82-02-WBN-24?
- (b) NSRS item R-82-07-WBN-02?
- (c) NSRS item R-82-07-WBN-06?

RESPONSE

The intent of the memorandum was to document resolution of the three concerns addressed in attachments 1, 2, and 3. These were:

- (1) That the WBN welding program did not provide filler material records necessary to satisfy AWS D1.1-1972.
- (2) That the WBN welding program did not provide inprocess inspection records to satisfy AWS D1.1-1972.
- (3) NSRS review of WBN weld program indicated that inspections had been performed through carbo zinc primer.

These three statements had been agreed to by OQA and NSRS in meetings on October 28, 1983 (OQA 831118 425) and December 21, 1983 as adequately defining and scoping the remaining or unresolved NSRS concerns associated with R-82-02-WBN-24, R-82-07-WBN-02, and R-82-07-WBN-06. Note that the purpose of the December 21, 1983 meeting was stated in the informal memorandum from J. R. Lyons II to H. N. Culver dated December 20, 1983, WBN - AWS Weld Program (no RIMS number) to be:

"At the Wednesday meeting we intend to discuss each evaluation and determine the areas in which OQA and

NSRS agree or disagree. It is intended that this effort provide a basis for determining any corrective actions or for closing NSRS items R-82-07-WBN-02 and -06, and R-82-02-WBN-24."

2. QID B

STATEMENT

The following is a summary of the key events that led to the eventual resolution of the NSRS concerns:

QUESTION

Although not listed in the "summary of key events," did the following events also "lead to the eventual resolution of the NSRS concerns" regarding the carbo zinc issue?:

- (a) January 12, 1984 meeting with USNRC Region II in Atlanta to discuss the specification G-29C program?
- (b) January 23, 1984 revision to specification G-29C (P.S.3.-C.5.4) to delete references to inspection through carbo zinc primer?
- (c) February 10, 1984 (scheduled) meeting with USNRC-NRR in Bethesda to present G-29C exceptions to the AWS D1.1-72 structural welding code?

RESPONSE

- (a) The January 12, 1984 meeting with USNRC Region II was held to provide additional support to the OQA and NSRS positions regarding weld filler material control and inprocess weld inspection records which were to be presented to the TVA Board.
- (b) The OQA recommendation to OEDC that G-29C be revised to delete provisions for reinspection through carbo zinc was made to preclude any future concerns in this area, but was not a basis for closure of the inspection through carbo zinc issue.
- (c) The meeting with USNRC-NRR in Bethesda was in response to the January 18, 1984 Board meeting to ensure that NRR understood and accepted the TVA exceptions to AWS D1.1-1972 as defined in G-29C. These exceptions were not related to the inspection through carbo zinc issue.

3. QID C

### Statement

In your memorandum to me dated August 10, 1983 (GNS 830811 050), you identified three concerns your organization had with respect to the AWS Welding Program at Watts Bar Nuclear Plant. They were filler material records, inspection records, and inspection through carbo zinc.

### QUESTION

The NSRS memorandum dated August 10, 1983 identifies a conflict between the procedure and acceptance criteria of G-29C process specifications for inspection of welds through primer:

- (a) Was this conflict specifically addressed and resolved?
- (b) If not, why?
- (c) If so, was the resolution documented and was a response transmitted to NSRS?

### RESPONSE

- (a) The alledged conflict involving inspection of welds through carbo zinc primer was specifically addressed and resolved.
- (b) Not applicable
- (c) The resolution was documented and transmitted to NSRS. Numerous discussions led to final documented acceptance that the issue was resolved. The summary presentation of the agreement that the issue of visual inspection through carbo zinc primer was acceptably addressed was based on two sets of documentation. The first set is summarized in attachment 3 to the January 30, 1984 memorandum (OQA 840130 002) from Anderson, OQA to Culver, NSRS. The "Sample Program Results" on page 1 summarized inspections of 35,000 linear inches of welds for configuration and 23,600 linear inches of welds for quality; (configuration denotes weld length, size, overlap, convexity and concavity and quality denotes cracks, porosity, are strikes and craters). For these sample, weld quality was 100% acceptable and the weld configuration was 100% acceptable for cable tray supports, duct hangers and conduit supports. However, 667 linear inches (3.63%) of miscellaneous structural steel welds were unacceptable for configuration only. The sample program inspections for quality were conducted with the primer removed. The second set of documentation was actual weld inspection results from July 1981 and from June 1982 which were reviewed by NSRS.

The July, 1981 inspections were for configuration only and were noted that in some instances the welds were painted. The June, 1982 inspections were for configuration and quality; surface conditions noted were "suitable for MT," poor, rough, etc. In no case was a painted or primed surface noted.

4. QID D

STATEMENT

We attempted to respond to your concerns in my memorandum to you dated October 20, 1983 (OQA 831020 002).

QUESTION

The OQA memorandum dated October 20, 1983 states that "the issue of inspection of welds through carbo zinc primer has been resolved by the closure of NSRS item R-82-07-WBN-06; the subject of this memorandum is NSRS item R-82-02-WBN-24.

- (a) Since item R-82-07-WBN-06 was closed by OQA on 8-24-83, how was closure of this item the basis for OQA closure of item R-82-02-WBN-24 on 5-6-83?
- (b) Since item R-82-02-WBN-24 identifies the inspection of welds through primer as a contrast to AWS D1.1-72, why doesn't the memorandum address the issue as related to the structural welding code?

RESPONSE

- (a) R-82-02-WBN-24 (AWS Deviations) was closed by the OQA Design Quality Assurance Branch on May 6, 1983 (OQA 830506 002) based on their review of the technical justifications provided by OEDC to NSRS (EDC 821215 004). The memorandum from NSRS dated August 10, 1983 - subject R-82-02-WBN-24 - to OQA (GNS-830811 050) questioned the OQA action and identified three issues for further consideration. These were the same three issues discussed in QID-A above.

R-82-07-WBN-06 (Qualification of Welding Procedures for Inspection thru Carbo Zinc) was closed by OQA on August 24, 1983 (OQA 830824 002) based on qualification tests performed by OEDC (EDC 830621 004).

The closure of R-82-07-WBN-06 in August 1983 was not the basis for closure of R-82-02-WBN-24 in May, 1983.

- (b) The contrast between G-29C and AWS as it related to the carbo-zinc issue was addressed in the resolution of R-82-07-WBN-06 and not as a part of R-82-02-WBN-24.

This was due to the fact that weld acceptance inspection for quality through carbo zinc was never intended; therefore it was never addressed as a deviation from the AWS code.

Note that the OQA memorandum of October 20, 1983 was in response to the NSRS memorandum of August 10 1983 and thus had the same subject heading which was related to closure of R-82-02-WBN-24. However, the OQA comments related to inspection through carbo zinc were stated in item 1 to be related to R-82-07-WBN-06.

5. QID E

STATEMENT

Your concerns were not resolved and on October 28, 1983, we met with you to attempt to reach a resolution. The meeting was documented by a memorandum to the Systems Engineering Branch Files dated November 18, 1983 (OQA 831118 425). A plan of action was agreed to in the meeting, and OQA proceeded to implement the plan.

QUESTION

The OQA memorandum dated November 18, 1983, for "Actions to be Taken" regarding "Inspection through carbo zinc," states that OQA will "develop a factual history of all actions taken" and will "evaluate if the actions taken provide an adequate basis for closure of the problem."

- (a) Was a "factual history" developed by OQA prior to November 18, 1983?
- (b) Was an evaluation of the "actions taken" to "provide an adequate basis for closure" performed by OQA prior to November 18, 1983?
- (c) Was the "plan of action" completed and documented?

RESPONSE

- (a) A factual history had not been prepared in a consolidated form which included all related OEDC, NSRS and OQA correspondence and documents. The lack of a single chronology of related events had contributed to communication difficulties between the three organizations.
- (b) The purpose of the October 28, 1983 meeting was to discuss the NSRS concern stated in their August 10, 1983 memorandum (GNS 830811 050) that OQA had acted prematurely in closing R-82-02-WBN-24. The action item in question was that OQA would "(re)evaluate if the

actions (previously) taken (by OEDC and OQA) provide(d) an adequate basis for (the) closure of the problem (R-82-02-WBN-24) (by OQA)." Portions in parentheses provided for clarification.

- (c) Yes. The memo from J. W. Anderson to H. N. Culver dated January 30, 1984 (OQA-840130 002) documented closure of the NSRS concern and completed the plan of action.

6. QID F

STATEMENT

Numerous informal meetings were conducted between our organizations to attempt to clarify the concerns and their resolutions. Attachment 1 of this memorandum is the final resolution on filler material records and supporting information which was used to draw OQA conclusions. Attachment 2 of this memorandum is the final resolution on inspection records and supporting information which was used to draw OQA conclusions. Attachment 3 of this memorandum is the final resolution on inspection through carbon zinc and supporting information which was used to draw OQA conclusions.

QUESTION

- (a) Regarding the "numerous informal meetings," were any of these meetings documented (i.e. notes of meeting issued) to reflect information presented and discussed, and agreements and disagreements?
- (b) Note: Questions regarding "Attachment 3" are presented separately (below).

RESPONSE

- (a) The informal meetings and discussions were not documented.
- (b) No response required.

7. QID G

STATEMENT

On January 18, 1984, NSRS and OQA met with the TVA Board of Directors. In that meeting you concluded that all of your concerns were resolved and that you agreed with OQA's conclusions.

QUESTION

- (a) Was the January 18, 1984 meeting with the TVA Board the point at which NSRS concluded that all of their concerns were resolved? If not, when?
- (b) How did this one meeting succeed, since numerous meetings in the past had apparently failed, in resolving all the NSRS concerns?
- (c) Was information, other than that contained in the January 30, 1984 memorandum, presented or discussed at the TVA Board meeting?

RESPONSE

- (a) The January 18, 1984 meeting with the TVA Board was not "the point" when NSRS concluded their concerns were resolved - there was no "the point" rather a series of points which are best summarized in the January 30, 1984 OQA to NSRS memorandum. It should be recognized that the January 30, 1984 memorandum was not intended to capture every meeting, telephone discussion, etc. However the memorandum does contain sufficient documentation to support an affirmative decision to close the carbo-zinc issue in a summary sense.
- (b) This question presumes an affirmative answer to G.(a) which is not the case in a simplistic view.
- (c) The memorandum from W. F. Willis to General Manager's File (EDC 840213 003) summarizes the Board briefing of January 18, 1984. No information other than that stated in these minutes was presented or discussed. The January 30, 1984 OQA memorandum to NSRS relates the essential discussions at the Board briefing dealing with the inspection through carbo-zinc, and is contained in attachment 3 to the OQA memorandum.

8. QID H

STATEMENT

We believe that all of your concerns have been satisfactorily resolved and we no longer consider your AWS Welding Program concerns to be an open issue.

Record Note: This memorandum was coordinated with H. N. Culver on 1/30/84. He is in full agreement with the content and he acknowledges that the data presented resolves all NSRS concerns.

### QUESTION

Does this mean that the NSRS staff reviewed and accepted the "content" and "data" for accuracy and completeness?

### RESPONSE

The record note is explicit in stating coordination of the memorandum with H. N. Culver and his agreement and acknowledgement. The dialogue regarding weld inspection through carbo zinc primer was lengthy both in words and in time. Many different people were involved in the dialogue at different times including various NSRS staff. It can be concluded from the record note that after the lengthy dialogue, Mr. Culver spoke for NSRS as the Director of NSRS and its staff. Accuracy and completeness are subtle issues not explicitly stated in the record note and either may or may not have been part of Mr. Culver's coordination, agreement and acknowledgement. "Full agreement with the content" could be presumed to endorse accuracy; acknowledgement of resolution could be presumed to endorse sufficient completeness to resolve the concerns as is explicitly stated.

9. QID 1A

### STATEMENT

CONCERN NSRS review of WBN weld program indicated that inspections had been performed through carbo zinc primer.

### QUESTION

- (a) Was the performance of such inspections the only aspect of the "concern"?
- (b) What about the lack of approved procedures? (NSRS item R-8207-WBN-02)
- (c) What about the lack of a documented "qualification" program to justify the ability of inspectors to detect defects through primer? (NSRS item R-82-07-WBN-06)
- (d) What about the aspect of deviation from the AWS D1.1-72 code and FSAR commitment? (NSRS R-82-02-WBN-24)

### RESPONSE

- (a)-(d) The statement is an adequate summary description of the concern. Items (b), (c), and (d) are valid "aspects" of the concern but by no means the only "aspects". It would be very difficult to state all the aspects of the concern at this time without reinvolving all the parties to the concern

from the beginning. It is deemed sufficient that the extensive dialogue leading to the January 30, 1984 summary memorandum convinced the NSRS Director that closing the concern of weld inspection through carbo zinc primer was warranted. To attempt to state all the aspects of the concern would presume to speak for all parties to the dialogue.

It should be noted that the June 23, 1982 memorandum from Culver, NSRS to Kimmons, OEDC transmitting the R-82-07-WBN states "...this review was not concerned with the technical aspects of inspecting welds through carbo zinc primer. Rather, this review was concerned with whether or not such inspections were in accordance with approved site procedures and that justification for such inspection procedures was adequately documented..." The long continuing dialogue interjected a number of aspects of the inspection concern that were related to R-82-07-WBN findings but not necessarily converging on the final resolution.

10. QID 1B

STATEMENT

CONST requested approval from EN DES to inspect through carbo zinc primer as a part of a series of sample programs in which welds were being reinspected to determine their adequacy and the adequacy of previous inspections.

QUESTION

If the purpose was "to inspect through carbo zinc as a part of a series of sample programs," did the approval for such inspection clearly limit the practice to the "sample programs?"

RESPONSE

CONST management requested approval to visually inspect welds as part of sampling programs for weld configuration without removing the primer. Although it is not clear to an outside observer, it is felt that the engineering and construction people understood the nature of the approval granted by the November 2, 1981 Cantrell to Wilkins memorandum. Authorized inspection of welds in question at that time was based upon a full visual inspection prior to applying the primer, and the November 2, 1981 memorandum did not grant specific authority to accept welds based upon an initial visual examination through primer after November 2, 1981. Therefore, it is concluded that any initial acceptance

of welds with primer applied was limited. This position is supported by Reference N to the NSRS R-82-07-WBN report.

Reference N is a Schrandt, QA Engineer to QAB Files, QAS 811217 010, memorandum which states "...EN DES concluded welds requiring only visual examination could be inspected with primer applied under conditions stated in the memorandum. Inasmuch as these welds were inside the building they had previously been subject to the Watts Bar quality control program prior to the EN DES requirement for a sampling program with respect to weld quality."

The November 2, 1981 memorandum does not explicitly and clearly state the approval the way the Schrandt memorandum states the case. However from an indepth review of the related correspondence of that general time, an outsider can conclude with reasonable certainty the intent of the parties. The considerable degree of misunderstanding regarding just what was authorized could have been avoided if the construction request and the Engineering authorization had been more clearly documented at the outset.

11. QID 1C

STATEMENT

Inspection through carbo zinc authorized for:

- Welds made prior to November 2, 1981
- Inspections made after November 2, 1981
- Carbo zinc 5 mils and sprayed in accordance with the applicable specification.

QUESTION

- (a) Are the "inspections made after November 2, 1981" part of the "sampling program," or does this statement apply to any inspections?
- (b) How do the inspectors determine if a specific weld was made prior to, or after, November 2, 1981?

RESPONSE

- (a) The EN DES approval applied to reinspection of welds for configuration only through a maximum of 5 mils carbo zinc primer which was responding to a specific CONST request.
- (b) There was no effective way for an inspector to determine the date a weld was made. According to the weld inspection supervisors, this difficulty was a major reason the inspectors did not exercise the latitude provided by engineering and the procedures.

12. QID 1D

STATEMENT

All welds inspected for weld quality (porosity, lack-of-fusion, cracks, etc.) as a part of an EN DES directed sampling program to be cleaned.

QUESTION

- (a) If this statement is intended to be a quotation from the Process Specification 3.C.5.4, why was the "unless exempted by EN DES" provision not included in this statement?
- (b) Does this statement mean that welds inspected for quality, and not part of the EN DES directed sampling program, need not be cleaned?

RESPONSE

- (a) The statement was not intended to be a direct quotation rather as a bounding statement expressing a summary allowable action.
- (b) The EN DES requirement was that welds not be painted until examined and accepted. Subsequent reinspections "not part of the EN DES directed sampling program" were not addressed. No approval was ever given by any organization to inspect for weld quality through carbo zinc primer.

13. QID 1E

STATEMENT

Acceptance criteria for weld defects to be in accordance with G-29C.

QUESTION

- (a) Is there "acceptance criteria for weld defects," other than in G-29C, that would apply?
- (b) Is there "acceptance criteria," other than for "weld defects," that apply?

RESPONSE

- (a) Within the scope of the November 2, 1981 memorandum, there were no acceptance criteria for weld defects other than G-29C. There were numerous other acceptance criteria for weld defects which were not covered by the

November 2, 1981 memorandum such as criteria for surface (not visual) or volumetric examination.

- (b) There are no acceptance criteria, other than for weld defects, that apply to the concern about reinspection of welds through carbo-zinc primer. The visual examination weld acceptance criteria were contained in G-29C and included both weld quality and weld configuration defect limits. Reinspection for weld quality defects through carbo zinc primer was never allowed by G-29C.

14. QID 1F

STATEMENT

SAMPLE PROGRAM RESULTS:

<u>Scope</u>	<u>Sample</u>	<u>Results</u>
Cable tray supports	8,000 linear inches (configuration) 3,500 linear inches (quality) (note 1)	100% acceptable
Duct hangers	5,000 linear inches (configuration) 2,100 linear inches (quality)	100% acceptable
Misc. struc. steel	18,000 linear inches (both)	100% acceptable for quality 667 inches unacceptable for configuration (3.63%)
Conduit supports	4,000 linear inches (configuration) (note 2)	100% acceptable

QUESTION

- (a) How do the "Sample Program Results" relate to each of the aspects (see Question 1A, above) of the carbo zinc concern?
- (b) Where are the sample program results for "instrument supports" and structural steel (other than "misc. stru. steel")?

RESPONSE

- (a) The sample program results were associated with the resolution of several NCRs, and were conducted to address issues independent of the carbo zinc concern.

A portion of the welds included in these samples were reinspected through carbo zinc. This was the basis for the initial CONST request to EN DES to allow reinspection through carbo-zinc for these samples. EN DES authorized reinspection of welds made prior to November 2, 1981 through carbo-zinc for weld configuration characteristics (size, location, undercut, overlap and weld splatter), but required that re-inspection for weld quality (cracks, porosity and lack of fusion) have the primer removed.

The sample program results provided a basis for evaluating the adequacy of a large body of welds independent of the carbo zinc issue. The results provide confidence that even if welds had been inspected through carbo zinc primer, there is a very low probability of a weld defect.

- (b) There were no previous sample programs for instrument supports. All the sampling programs being discussed in the carbo zinc issue were for structural steel welds - the scope descriptions were for specific support applications.

15. QID 1G

STATEMENT

NOTE 1: All sample program inspections upon which the determination of acceptability of weld quality were based were conducted with primer removed.

QUESTION

- (a) Does the "Note 1" apply to all of the "Scope" items, or just to the "cable tray supports" item, for weld quality?
- (b) Why is the "cable tray supports" item the only "Scope" item that has the "(note 1)" reference?

RESPONSE

- (a) Note 1 applies to all of the scope items.
- (b) This was an error on the chart. Note 1 should have been included as a general note.

16. QID 1H

STATEMENT

NOTE 2: Weld quality accepted based on cable tray support sample program.

Based on these sample programs, the primary area of uncertainty with respect to weld acceptability is related to weld configuration (i.e. overlap, undercut, size, etc.).

QUESTION

- (a) If "weld configuration" is the "primary" area of uncertainty, what other (i.e., secondary, tertiary, etc.) area(s) of uncertainty is applicable?
- (b) Is the "uncertainty" ... "based on these sample programs"? If so, how was the "uncertainty" resolved? If not, what is the "uncertainty" based on?

RESPONSE

- (a) There were no areas of uncertainty with respect to weld acceptability other than weld configuration. Deletion of the word "primary" would not affect the intent of this sentence.
- (b) No. The uncertainty was based on the NCRs being evaluated. The results of the sample programs limited the area of uncertainty to weld configuration (and not weld quality), and provided a basis for acceptance of the welds within the scope of the NCRs.

17. QID 2A

STATEMENT

Inspection through carbo zinc acceptable for:

- weld configuration (overlap, undercut, size, location)
- large cracks
- coarse porosity.

Inspection through carbo zinc unacceptable for:

- small cracks
- fine porosity.

Based on this qualification program, the area of concern for any inspection conducted through carbo zinc is limited to small cracks and fine porosity.

QUESTION

- (a) Does this mean that welds can be inspected for weld quality (cracks, porosity, etc.) through carbo zinc?
- (b) Does this mean that "small cracks" and "fine porosity" are acceptable if not detected through carbo zinc?

- (c) What are the definitions for "small" versus "large," and "fine" versus "coarse," as applicable to cracks and porosity?
- (d) Are these statements consistent with the OEDC results and conclusions of the OEDC "qualification program"?

RESPONSE

- (a)-(d) The November 2, 1981 memorandum authorized inspection through carbo zinc primer for weld configuration as part of a sampling program from previously accepted welds. The qualification program demonstrated that from a technical acceptability point of view large cracks and porosity can be detected through the carbo zinc primer if 5 mils or less in thickness. Further, although visual inspection was generally enhanced by the primer, detection of fine cracks and porosity could be limited. Rather than assess structural acceptability of any cracks and porosity beyond G-29C limits, sampling inspections for weld quality was not permitted through carbo zinc primer. Therefore definitions of large versus small and coarse versus fine are not a consideration at issue and the program is totally consistent.

18. QID 25

STATEMENT

Welds at Watts Bar were inspected through carbo zinc as a part of the weld sample program.

QUESTION

Does this mean that welds, other than "as part of the weld sample program," were not inspected through carbo zinc?

RESPONSE

The NSRS Report R-82-07-WBN provided in the details for R-82-07-WBN-02 (paragraph IV.B), "...four admitted to having inspected carbo zinc primed welds. While such inspections had been made, the practice apparently had not been extensive. Based on these interviews, it appeared that only 100 to 150 welds may have been inspected in this manner. This could not be substantiated by a review of the records, however, nor was it possible to specifically determine which welds were inspected in this manner."

19. QID 2C

STATEMENT

Inspection through carbo-zinc was not authorized by EN DES for determination of acceptability of weld quality (porosity, lack-of-fusion, cracks, etc.).

QUESTION

Refer to Question 1D, above.

- (a) Why does this statement not include: "...as a part of an EN DES directed sampling program...unless exempted by EN DES"?
- (b) What is the basis for this statement?
- (c) Refer to Question 6B(a); is there a contradiction in these statements?

RESPONSE

- (a)-(b) The OQA statement in question is a summary statement of fact and applies whether part of a sampling program or not; EN DES always has an option of providing specific evaluations and exemptions if technically justified. The documentation dealing with the carbo-zinc primer issue contains no EN DES authorization to inspect or reinspect for weld quality through carbo zinc primer.
- (c) By choosing to use "limit" in the wording a simple reading could lead to a perception of a contradiction. However, taken in view of all the documentation prior to August 24, 1983 when the G-29C Addendum 2 was issued, no contradiction exists. The G-29C specification was and continued to be a "limiting" document. A better choice of wording might have been to "clarify" rather than "limit."

20. QID 2D

STATEMENT:

Results of sample programs indicate weld quality was not an area of uncertainty for samples.

QUESTION

- (a) If "weld quality was not an area of uncertainty," then why were weld quality inspections performed?

- (b) Is the "area of certainty" applicable only "for samples"? If so, what about the total population that the "samples" represent?

RESPONSE

- (a) The weld samples were conducted as a part of the OEDC actions to evaluate and resolve several NCRs involving the WBN weld program. For those NCRs, the integrity and acceptability of the welds were indeterminate from both a weld quality and weld configuration perspective. The samples provided a basis for determining that both weld quality (no quality defects identified) and weld configuration (3.63% of sample included deviations determined by EN DES to be acceptable as is) were acceptable.
- (b) No. The weld sample results established the uncertainty limits and provided a statistical basis for determining that the total population of weld were acceptable subject to the uncertainty limits of the sample.

21. QID 2E

STATEMENT

Results of weld qualification program indicates that weld quality can be determined through carbo-zinc, with the exception of small cracks and fine porosity.

QUESTION

Refer to Question 2A, above; the same questions apply to this statement. Also see Question 6A.

RESPONSE

The statement identified is a summary statement concerning the results of the qualification program. The answer to 2A and 6A apply equally to this question.

22. QID 2F

STATEMENT

Available data, including NSRS evaluation notes, indicates that the extent to which inspection through carbo zinc may have been conducted outside the sample program was relatively small.

QUESTION

- (a) Are the "available data" and "evaluation notes" available for review?

- (b) Do the "data" and "notes" define the "extent to which inspection through carbo zinc may have been conducted outside the sample program"?
- (c) How much (quantitatively) is "relatively small"?

RESPONSE

- (a) The evaluation notes are available for review. The other available data was informal and there are no records available.
- (b) The data and NSRS notes indicate that there may have been 100 to 150 welds inspected through carbo zinc. The sample data associated with HVAC duct hanger samples identifies those reinspected through primer. However, whether the 100 to 150 welds were within the sample programs cannot be determined because no specific welds were identified to NSRS.
- (c) Relatively small is 100 to 150 welds.

23. QID 2G

STATEMENT

OQA CONCLUSION

Based on the information provided above regarding the area of uncertainty from the weld sample programs (weld configuration), the area of concern for any inspections through carbo zinc primer (weld quality), and the extent to which inspections may have been conducted through carbo zinc, the integrity of the welds at Watts Bar Nuclear Plant are not in question.

QUESTION

Is "the integrity of the welds...not in question" because of the "area of uncertainty," the "area of concern" and the "extent to which inspections may have been conducted"?

RESPONSE

Yes. The NSRS and OQA evaluations indicated that a small but indeterminate number of welds may have been inspected through carbo zinc outside the authorized sample programs. Since the OEDC test program (EDC 830621 004) had indicated that the determination of weld quality through primer was not an acceptable practice, the integrity of any welds that may have been so inspected was in question.

The sample program results had not identified any weld quality defects, and thus provided a basis for concluding,

with a high degree of confidence, that any welds actually inspected thru primer did not include weld quality defects, and were thus adequate. The composite results of the weld samples provided the basis for concluding that the integrity of the welds at Watts Bar Nuclear Plant (i.e. their technical adequacy) were not in question.

24. QID 2H

STATEMENT

NSRS POSITION

NSRS agrees with the OQA conclusions regarding the adequacy of the OEDC program.

QUESTION

- (a) Does NSRS agree that each of the NSRS findings regarding carbo zinc (R-82-02-WBN-24, R-82-07-WBN-02 and R-82-07-WBN-06) have been adequately addressed and resolved?
- (b) If so, why was this OQA memorandum and "Attachment 3" issued?

RESPONSE

- (a) NSRS agreed that the findings regarding weld inspection through carbo zinc primer were adequately addressed and resolved.
- (b) The purpose of the January 30, 1984 OQA memorandum was stated in the opening paragraph of the memorandum as "to document final resolution and closure of NSRS concerns with the AWS Welding Program at the Watts Bar Nuclear Plant." The resolution process for the findings had been lengthy and somewhat confusing. It was deemed appropriate that the OQA memorandum be issued to supercede and/or augment any prior documentation.

25. QID 3A

STATEMENT

CONST verbally requested that EN DES evaluate the acceptability of visual examination of welds in accordance with G-29C after coating with carbo zinc.

Note: Involved OEDC personnel have stated that the purpose of this request was to facilitate the performance of a series of weld sample programs underway at WBN to verify the acceptability of

welds. These sample programs were to evaluate both weld configuration (location, size, undercut, and overlap) and weld quality (porosity, cracks, lack-of-fusion, etc.) for welds which had been previously inspected and accepted.

QUESTION

If the "purpose" was for the "sample program" only, why didn't OEDC clearly state this in their memorandum and process specification?

RESPONSE

The response to this question is the same as the response to 1B above.

26. QID 3B

STATEMENT

November 2, 1981 - SWP 811102 056 authorized visual examination of welds in accordance with G-29C after coating with carbo zinc, provided (quote):

1. Carbo zinc thickness is 5 mils maximum.
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 directed sampling program are to be cleaned.

QUESTION

- (a) Does this memorandum apply to only "sample program" inspections?
- (b) If so, why does the effective date (11-2-81) cover periods not within the scope of the "sample program"?

RESPONSE

- (a) The CONST management had requested approval to inspect previously accepted welds which had subsequently been primed with carbo zinc to facilitate the sample inspections for weld configuration. The November 2, 1981 memorandum was intended to respond to the CONST request. Although the original request was made to facilitate

sampling program inspections, there are no obvious technical reasons the authority could not be justified for other inspections for weld configuration.

- (b) There was not a single "sample program." A number of nonconforming conditions were technically resolved by instituting sampling programs - some prior to November 2, 1981, some after November 2, 1981.

27. QID 3C

STATEMENT

December 1, 1981(A) CONST provided verbal authorization to inspectors. Note: This authorization may have been limited to one inspection unit.

QUESTION

- (a) What is the basis for stating that this "verbal authorization may have been limited to one inspection unit"?
- (b) Which inspection unit?
- (c) Was the December 1, 1981 "verbal authorization" based on the November 2, 1981 (30 days prior) memorandum?
- (d) Is "verbal authorization" an accepted practice for activities affecting quality?

RESPONSE

- (a) The basis for the statement that this verbal authorization may have been limited to one inspection unit was personal interviews conducted by OQA of each of the inspection unit supervisors at the time.
- (b) The one inspection unit was the electrical inspection unit.
- (c) The verbal authorization was based on the earlier issued memorandum.
- (d) Verbal authorization without supporting follow-up written authorization is not an accepted practice for activities affecting quality. To reemphasize this point the inspection units were instructed on December 15, 1981 that initial inspection through carbo zinc was not allowed by the procedures (see QID 3E).

28. QID 3D

STATEMENT

December 2, 1981(A) NSRS, during conduct of mini-management review, expressed concern with issue of inspection through carbo zinc.

RESPONSE

There was a QID with no question for this statement.

29. QID 3E

STATEMENT

December 15, 1981 - CONST verbally informed inspectors not to inspect through carbo zinc.

QUESTION

Why didn't CONST inform, in writing, the inspectors not to inspect through carbo zinc; if not in 1981, why not in 1982 or 1983?

RESPONSE

Acceptability of inspecting through carbo zinc did not become an issue until the November 2, 1981, memorandum from Cantrell to Wilkins was written. Copies of this memorandum were issued to units but no permission to inspect through carbo zinc was included in site procedures. Therefore, it was not deemed necessary to give inspectors written instructions not to inspect through carbo zinc since no procedure change permitting this inspection had been issued at this time. The use of a memorandum in lieu of procedures was not allowed, and management believed that this fact had been emphasized enough to inspectors and others. The only written instructions to inspectors on the carbo zinc issue was through procedure revisions.

30. QID 3F

STATEMENT

January 14, 1982 - NEB 820114 253 clarified condition under which inspections through carbo zinc is authorized (superseded SWP 811102 056) (quote):

1. The acceptance criteria for weld defects is in accordance with G-29C
2. The carbo zinc was sprayed in accordance with the applicable coating application specification.

QUESTION

- (a) Other than providing background information, and coating thickness and application restrictions, how is this memorandum different from the previous authorization for inspection through the primer?
- (b) Was this memorandum issued in response to the NSRS expressed concern? If not, why was it issued?
- (c) Was the reference to "sprayed" coating based on the recognition that carbo zinc may also be applied by the brush method?

RESPONSE

- (a) Other than providing background information and coating thickness and application restrictions, the January 14, 1982 memorandum is the same as the November 2, 1981 memorandum.
- (b) The memorandum was issued to satisfy the EN DES QA concern at that time. It provided information regarding the bases for allowing the limited inspection through carbo zinc primer.
- (c) It was recognized before the memorandum that carbo zinc primer could be brushed on as well as sprayed. Application by spraying was specified in the memorandum to reflect the EN DES requirement.

31. QID 4A

STATEMENT

The carbo zinc thickness is not greater than 5 mils as documented in coating inspection records and/or log books or as measured adjacent to the weld. Coating thickness measurement techniques shall be in accordance with the specification for coating application. All work performed after this date shall be examined before it is primed.

QUESTION

Refer to Question 2C, above.

RESPONSE

The 5 mils thickness is specified in the painting standard and is measured using a paint thickness gage which operates on magnetic principles. During the plant walkdown discussed in the January 14, 1982 memorandum, painting inspectors, using the thickness gage, measured the thicknesses as part

of the inspection qualification sampling. The laboratory prepared samples were similarly tested for primer thickness.

32. QID 4B

STATEMENT

January 25, 1982 - PS 3.C.4.5(a) issued. Authorizes inspection through carbo zinc with same restrictions as NEB 820114 253 for welds made prior to November 2, 1981.

QUESTION

The P.S.3.C.5.4(a) is dated 1-25-82, but when was it actually issued to CONST?

RESPONSE

The specification was transmitted to CONST February 12, 1982.

33. QID 4C

QUESTION

On June 3, 1982, NSRS Report No. R-82-02-WBN was issued, and contains a finding (R-82-02-WBN-24) regarding carbo zinc; why is this report not listed as a key event?

RESPONSE

Reference to this report was unintentionally omitted from the chronology. Note that the chronology was not developed to be a comprehensive listing of all correspondence and events related to the issue.

34. QID 4D

STATEMENT

June 23, 1982, NSRS Special Investigation R-82-07-WBN (GNS 820623 050) issued. Review conducted March 29 through April 2, 1982. Results included:

R-82-07-WBN-02, Improper Inspection of Structural Support Welds

Based on interviews with QC inspectors, it was concluded that 100 to 150 structural support welds had been inspected through carbo zinc primer without approved procedures.

### Recommendations

Due to the uncertainty of the outcome on the question of the site-approved procedures for inspecting welds through carbo zinc primer, the NSRS proposes two recommendations:

1. If this type of inspection is acceptable through implementation of the EN DES-approved process specification, then the welds should be used "as is."
2. If this type of inspection is unacceptable, then the welds should be reinspected in accordance with existing site approved procedures.

### QUESTION

- (a) Were these "100 to 150 structural support welds" part of the sampling program"?
- (b) Did the inspectors indicate that they noted the presence of coating on the inspection record for each weld?

### RESPONSE

- (a) Review of the R-82-07-WBN report and its supporting background and subsequent correspondence and related documentation does not provide an indisputable answer to the question of whether the 100 to 150 welds were part of a sampling program or part of the ongoing construction weld acceptance inspection program. However, a reasonable scenario is that the QC inspectors and their supervisors were following written instructions - that G-29C or written procedures or the November 2, 1981 EN DES, Cantrell to Wilkins (SWP 811002 056) memorandum was the basis for acceptance inspection. If the 100 to 150 were other than part of a sampling program, inspection through primer was not authorized and the inspections so performed would have been in violation of authorized procedures.

R-82-07-WBN states in paragraph IV. B that "Of the 24 inspectors interviewed, 9 believed inspection of carbo zinc primed welds was permitted by the memorandum" (11/2/81 EN DES). "Of nine inspectors, four admitted to having inspected carbo zinc primed welds...This could not be substantiated by a review of the records." Since the 11/2/81 memorandum was stated as the authorizing document, one can conclude:

1. No inspection welds which had carbo zinc primer applied would have been permitted prior to the 11/2/81 authorizing memorandum.

2. Work after 11/2/81 was required by the item 2 of the EN DES memorandum to be examined prior to applying the primer.
  3. Item 3 of the EN DES memorandum would allow by omission of direction carbo zinc primed welds directed as part of a sampling program be inspected for features other than quality.
- (b) Paragraph IV.B of R-82-07-WBN states that inspection of welds through carbo zinc primer could not be substantiated by a review of the records. This would indicate that the presence of coating was not noted for any of the welds in the record reviewed by NSRS in support of R-82-07-WBN.

35. QID 4E

STATEMENT

R-82-07-WBN-06, Documentation of Weld Sampling Program

Insufficient documentation exists to substantiate the weld sampling program conducted to verify that visual weld inspection could be made through carbo zinc primer.

QUESTION

Does this mean the "weld sampling program", or does it mean the "qualification program"?

RESPONSE

Paragraph IV.F of the R-82-07-WBN report discusses the insufficient documentation as related to 25 welds at WBN which were randomly selected for inspection along with two specially prepared weld samples. The results of the inspection of these welds were the basis for concluding that it was acceptable to visually inspect carbo zinc coated welds. This paragraph would indicate the insufficient documentation referred to the "qualification program" welds.

36. QID 5A

STATEMENT

July 22, 1982 EDC 820722 006 - Initial OEDC response to R-82-07-WBN includes (in part) (quote):

Inspection records from the Record Storage Vault signed by inspectors who stated to NSRS that they made inspections through carbo zinc have been examined. There is no entry on the record that the inspections were made through

carbo zinc. All records examined identified the applicable approved procedure (WBN-QCP-4.13) as the inspection document. Therefore, as previously stated, we conclude that the inspections were made using an approved procedure.

QUESTION

- (a) Did the inspectors indicate whether or not they had made an "entry on the record," regarding the presence of such a coating?
- (b) Were they instructed to make such an entry?
- (c) Do the record forms and procedure provide for such an entry?

RESPONSE

- (a) It cannot be determined whether the inspectors made any entries "on the record" regarding carbo zinc. The permanent weld inspection records do not contain such entries. However, the data sheets used for the weld sample programs had a space for recording "surface condition." A large percentage of the data sheets for the HVAC duct support weld sample sheets indicated that the surface condition was "painted."
- (b)-(c) Procedures allow for use of remarks to indicate conditions of interest to the inspectors which are not necessarily covered by the procedures. The record forms provide a space for remarks. Since inspection through carbo zinc primer was authorized only for sampling programs for weld configuration, it would not be expected that an inspector would remark that an unauthorized inspection was performed. Further, if the inspection was for an authorized condition, that authorized condition would not be noted normally. This could explain why the sampling program inspections of July 1981 had a surface condition noted as "painted."

37. QID 5B

STATEMENT

It has been determined that the reported inspections of structural welds involved were confined to the work of one engineering unit. As stated in the response to Item 01, CONST cannot find any record of inspections which were performed without an approval procedure.

QUESTION

- (a) How was it "determined that the reported inspections...were confined to...one engineering unit"?
- (b) Where the "sampling program" inspections performed to an "approved procedure" which defines the "record of inspection"? If so, was this "record of inspection" checked for notations of inspection through coatings?

RESPONSE

- (a) The determination of possible inspections through carbo zinc primer was made by discussions or interviews with the responsible unit supervisors.
- (b) The sampling program inspections were performed to the corrective action specified in the appropriate nonconforming condition report. The inspection of record was that required by the engineer to document the corrective action on the NCR. The answer to QID 5A(a) above explains the data sheets for sampling programs as related to surface conditions.

38. QID 5C

QUESTION

On May 6, 1983, OQA issued a memorandum to close NSRS item R-82-02-WBN-24; why is this key event excluded?

RESPONSE

See response to QID 4C.

39. QID 6A

STATEMENT

June 21, 1983 -

EDC 830621 004 OEDC follow-up response to R-82-07-WBN-06 provided the following results of the OEDC qualification program designed to ascertain the acceptability of inspection through carbo zinc (quote):

1. The qualification tests did substantiate the ability to perform visual inspection of welds through primer for size, location, undercut, and overlap as permitted in G-29C. (OEDC has not interpreted G-29C as permitting acceptance of weld quality based on an inspection through primer.)

2. The qualification tests did not substantiate a practical method of visual inspection of weld quality through primer in a construction environment.

QUESTION

- (a) What action was taken in response to the failure of the "qualification tests" to "substantiate a practical method of visual inspection of weld quality through primer"?
- (b) If none, why?

RESPONSE

- (a)-(b) No further action was deemed necessary since inspection for weld quality through carbo zinc primer was not authorized.

40. QID 6B

STATEMENT

August 24, 1983 - PS 3.C.5.4(a), Addendum 2, issued to limit scope of visual inspection through carbo zinc to weld configuration as follows (quote):

Revise paragraph 5.2.1 to read as follows:

5.2.1 - Welds made prior to November 2, 1981, which are coated with carbo zinc primer may be visually examined for weld size, undercut, overlap, and arc strikes in accordance with this process specification without removing the primer provided:

- (a) The carbo zinc was sprayed in accordance with the applicable coating application specification.
- (b) The carbo zinc thickness is not greater than 5 mils as documented in coating inspection records and/or log books or as measured adjacent to the weld. Coating in accordance with the specification for coating application.

QUESTION

- (a) Why was the process specification revised "to limit scope of visual inspection through carbo zinc to weld configuration?"
- (b) Does this mean that the previous version did not limit the scope to just configuration?
- (c) Refer to Question 2C(c); is there a contradiction in these statements?

RESPONSE

- (a) The process specification was revised at the request of the OQA to provide further clarification of the limits of permissibility of visual inspection through carbo zinc primer.
- (b) There was no change in the intended scope or application of the process specification. Since no process specification, memoranda, or procedures in existence prior to November 2, 1981, permitted the inspection of welds with any type of applied coating, it was concluded that all welds which had primer applied had received a visual inspection prior to their being coated. A sample program of welds which had been primed were stripped of primer and examined for weld quality showed that cracks and porosity were not a concern - in that there were none with rejectable levels of cracks or porosity.
- (c) There is no contradiction in that they are mutually exclusive. The statement of QID 2C is that inspection through carbo zinc primer for weld quality was not authorized, while the statement of QID 6B authorizes weld characteristics which are configurational in nature to be inspected through the carbo zinc primer if the welds were made prior to November 2, 1981.

41. QID 6C

STATEMENT

August 24, 1983 - OQA responded to OEDC that OQA had conducted necessary follow-up actions associated with R-82-07-WBN-06 and that the item was closed (OQA 830824 002).

QUESTION

- (a) For OQA's closure of item R-82-07-WBN-06, what consideration was given to the failure of the "qualification tests" (see Question 6A, above) and the revision "to

limit scope" of the specification (see Question 6B, above): If none, why?

- (b) What effect did the above events have on inspections performed prior to the date of the events?

RESPONSE

- (a) There was no consideration to be given in closure of R-82-07-WBN-06 to the failure of the qualification tests to substantiate a method of visual inspection for weld quality through carbo zinc primer. No inspection through carbo zinc primer for weld quality was permitted.
- (b) The question is non sequitur in that events occurring after the inspections could have no effect on the inspections. Since inspections for weld quality through carbo zinc primer were never authorized, failure of the qualification tests to qualify such inspections was of no consequence.

42. QID 6D

STATEMENT

October 18, 1983 - WBN QCP-4.13 revised to delete provisions for inspection through carbo zinc.

QUESTION

- (a) On October 28, 1983, did the procedure (WBN-QCP-4.13-VTC) "delete," or just revise, the provisions?

RESPONSE

The addendum to WBN QCP-4.13 RO dated October 28, 1983 accomplished the same clarification as the G-29C revision of August 24, 1983 (see response to 6B for intent). The deletion of all references to inspecting through carbo zinc occurred in revision 1 of WBN-QCP 4.13-VTC dated March 26, 1984.

43. QID 7A

STATEMENT

October 28, 1983 NSRS met with OQA and requested that OQA reconsider our actions to close R-82-02-WBN-02. The NSRS provided the following statements (quote):

- 1A. We disagree that this is closed for the following reasons:

1. Inspectors within the electrical, instrumentation, and civil welding groups stated they did inspections.
  2. OQA closure is based upon only the electrical group.
  3. OQA has documentation that only three welds, inspected by the electrical group, had primer on them and those three have not been inspected yet. No other welds were identified by OQA; therefore, the statement in 1A, second section is incorrect.
  4. Six of twenty inspection personnel interviewed by NSRS stated they inspected through primer but could not remember which welds. OQA obtained at a later date a list of welds inspected or not inspected through primer from three inspectors.
- 1B.
1. The inprocess specifications G-29C, P.S.3.C.5.4(a), dated March 9, 1983, which allows inspection through primer has not been revised. An addendum to G-29C dated August 12, 1983, which provides the revision has not been issued.
  2. WBN denied in a memorandum from Kimmons to Culver dated July 22, 1982 that personnel were told to inspect through primer using only a memorandum. In a memorandum from the electrical supervisor to an OQA employee received by NSRS on October 25, 1983, states that he told his inspectors to inspect through primer.

#### QUESTION

- (a) Was the meeting between OQA and NSRS for closure of "R-82-02WBN-02", or for closure of R-82-02-WBN-24?
- (b) If the later number is correct, and since this "Attachment 3" does not otherwise refer to NSRS item R-82-02-WBN-24, was this key event included in error?
- (c) If so, does it still apply to the carbonic issue

#### RESPONSE

- (a) The meeting was for neither R-82-02-WBN-02 nor R-82-02-WBN-24. The January 30, 1984 OQA memorandum obviously had a typographical error in its statement of the reason for the October 28, 1983 meeting. The NSRS finding R-82-02-WBN-02 was related to untimely audit responses and had nothing directly to do with welding program findings.

Finding R-82-02-WBN-24 was a broader base finding that the structural welding at WBN had not been accomplished in accordance with all the requirements of the AWS-D1.1-1972 structural welding code. The October 28, 1983 statements 1A and 1B, which were attributed to NSRS, address the issue of weld inspection through carbo zinc primer. The carbo zinc primer issue was one of eight subset issues given as examples of less stringent implementation of the AWS-D1.1-1972 requirements.

The NSRS finding R-82-07-WBN-02 relates specifically to the issues presented on October 28, 1983 items 1A and 1B. Thus, in all probability, the closure issue should have been R-82-07-WBN-02 not R-82-02-WBN-02 nor R-82-02-WBN-24.

- (b) Answered in 7.A(a)
- (c) Finding R-82-02-WBN-24 is applicable to the carbo zinc issue. The issue of weld inspection through carbo zinc primer was introduced by NSRS as one example of eight alleged problems in finding R-82-02-WBN-24. The issue was subsequently expanded in a special report on structural welding practices as findings R-82-07-WBN-02 and R-82-07-WBN-06. Upon resolution of the R-82-07-WBN-02 and R-82-07-WBN-06 findings, one example of eight examples of alleged problems cited in R-82-02-WBN-24 was resolved.

44. QID 8A

STATEMENT

Data Relative to Bounding Area of Concern

The following information and data is provided to define, to the extent possible, the area of concern with respect to inspection of welds through carbo zinc at WBN.

1. Types of welds - Structural welds governed by G-29C PS.3.C.5.4(a), including pipe hangers, cable tray supports, conduit supports, miscellaneous structural steel, duct hangers and instrument supports.
2. Date of welds - PS.3.C.5.4(a) authorized CONST to inspect welds made before November 2, 1981, through carbo zinc. Separate from that specification, a number of sampling programs at WBN have verified the acceptability of the seven types of welds identified in (a) above up to the effective dates of the sampling programs. The combination of the data is provided on Figure 1 to characterize the timeframe within which welds could have been made and subsequently inspected

through carbo zinc. Note that this does not imply that these welds were actually inspected through carbo zinc.

3. Date of Weld Inspections - Inspection through carbo zinc was initially authorized by EN DES on November 2, 1981 (SWF 811102 056). CONST verbally authorized the WBN inspectors to inspect through carbo zinc approximately December 1, 1981. This verbal authorization was rescinded on approximately December 15, 1981. PS.3.C.5.4(a) authorized inspection through carbo zinc from January 25, 1982, to August 12, 1982. WBN QCP-4.13 authorized the inspection through carbo zinc from September 13, 1982, to October 28, 1983.
4. Location of welds - There is no data available which would bound the location of welds which may have been inspected through carbo zinc.
5. Inspection Units Involved - The NSRS review notes indicate that inspectors within the electrical, instrumentation, and civil welding groups had stated that they had performed inspections through carbo zinc.

#### QUESTION

- (a) Does this "Bounding... information and data" apply to the "sampling plan" inspections?
- (b) If so, how does each of the items (2 thru 5) relate to the "sampling program"?
- (c) If not, how does the item 3 relate to the inspection?

#### RESPONSE

- (a) No. The bounding information was developed to more clearly define potential areas which fall within the concern. This has nothing to do with the bounds of the sample programs.
  - (b) No answer required.
  - (c) Item 3 identifies the dates various documents authorized (with restrictions as previously noted) inspections through carbo zinc.
45. QID 8B

#### STATEMENT

General -

- a. The NSRS report indicated:

- (1) that of 24 inspectors interviewed, 9 believed inspection through carbo zinc had been permitted and 4 indicated they had actually performed inspection through carbo zinc,
- (2) it appeared that 100 to 150 structural support welds had been inspected through carbo zinc primer without approval procedures, and
- (3) that this could not be substantiated by a review of the records nor was it possible to specifically determine which welds were inspected in this manner.

Note: The OEDC response to R-82-07-WBN-02 verified that the inspection records did not indicate that the inspections had been made through carbo zinc.

QUESTION

Refer to Question 5A, above.

RESPONSE

The response to this question is contained in the response to 5A above with the following added information. An unasked question exists relating to the NSRS interviews of the 24 inspectors. Were the 100 to 150 structural support welds inspected through carbo zinc primer without approved procedures being inspected for initial acceptance of weld quality and weld configuration or as part of a sampling program for an NCR corrective action? Since the question was not asked and cannot be unequivocally answered one must rely upon the results of the sampling program for confidence that the welds which may have been improperly inspected are acceptable.

46. QID 9A

STATEMENT

In March 1983, CONST questioned their inspectors to determine if they could identify any welds which had been inspected through carbo zinc. Three (3) conduit supports were identified and were documented under an IRN. These supports were later cleaned and reinspected and were found to be acceptable.

QUESTION

- (a) Why did it take 15 months (December 1981 to March 1983) for CONST to act upon this matter?
- (b) How were the three conduit supports identified?  
Records?

RESPONSE

- (a) During the 15 month time frame, CONST was working with information from anonymous sources and no specific welds were identified. When an inspector admitted he had inspected through carbo zinc, all inspection records signed by that inspector during the timeframe were pulled, the welds cleaned and reinspected. There was not a 15 month time lag.
- (b) The three conduit supports were the only items specifically identified as being inspected through carbo zinc. The inspector prepared an IRN which identified them. This was IRN-E-BHP-144.

47. QID 10A

STATEMENT

	.1979	.1980	.1981	.1982	.1983
1. Pipe Hangers		_____			
		_____			
		2			
2. Cable Tray Supports			_____		
			_____		
			3		
3. Conduit Support			_____		
			_____		
			3		
4. Miscellaneous structural steel			_____		
			_____		
			3		
5. Duct Hangers			_____		
			_____		
			4		
6. Instruments Supports					
				1	

QUESTION

- (a) Where is the data for "Instrument Supports"?
- (b) Where is the data for structural steel (other than "miscellaneous")?

RESPONSE

- (a) No sample program was performed on instrument supports
- (b) All the sample programs were for structural steel welds. Miscellaneous structural steel is one category of structural steel.

## ACCEPTANCE CRITERIA COMPARISON

CRITERIA	P.S.3.C.5.2 AWS D1.1-72	P.S.3.C.5.4 PRIOR TO 2/13/81	P.S.3.C.5.4 AFTER 2/13/81
Convexity	.15 in. + .03 in.	.15 in. + .06 in.	.15 in. + .06 in.
Undercut	.01 in. deep transverse to stress  1/32 in. deep parallel to stress	Pipe hangers - 1/32 in. deep on stressed members  Other components - 1/32 in. deep on stressed members except an additional 1/32 in. deep and 1/4 in. length not to exceed 10% of the run. Undercut in non-stressed members is not cause for rejection.	1/32 in. deep on stressed members. Undercut on non-stressed members shall not be cause for rejection.
Undersize	1/16 in. underrun for 10% of length	Cable tray supports - EN 2688 showed minimum size.  Duct supports - 3/16 in. is minimum size. 1/16 in. underrun for entire length on welds larger than 3/16 in.	1/16 in. underrun for 10% of length
Arc strikes and weld spatter	No arc strikes or weld spatter allowed	Random arc strikes and weld spatter are acceptable if cleaned by wire brushing	No arc strikes allowed. No weld spatter allowed, except nonexcessive weld spatter is acceptable on carbon steel surfaces not being painted.

Technical Basis for Changes

- Convexity - Allowed by AWS D1.1-1980.
- Undercut - No Code addressed non-stressed members, new tolerances allowed by ASME III, NAVSHIPS 0900-005-9010 and NAVSHIPS 0900-000-1000.
- Undersize - EN DES calculations support the changes (SWP 821022013 and SWP 820127042).
- Arc strikes and Weld spatter - Not normally considered defects. Brittle and fatigue failure frequently initiate from arc strikes. These components are not subject to nor designed for fatigue failure. These materials would not fail from brittle fracture but from ductile fracture.

QUESTION

- (a) What does this "Acceptance Criteria Comparison" have to do with the carbo zinc issue?
- (b) Where is the AWS D1.1-72 comparison for inspection through primer?

RESPONSE

- (a) The acceptance criteria comparison shows that there is no difference between AWS and G-29C for the carbo zinc issue.
- (b) There is no comparison because the inspection through primer was for sample programs and not for new inspections.