



Department of Energy
 Office of Civilian Radioactive Waste Management
 Yucca Mountain Site Characterization Office
 P.O. Box 98608
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SEP 30 1996

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 Site Characterization Project
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 101 Convention Center Drive
 Las Vegas, NV 89109

**VERIFICATION OF CORRECTIVE ACTIONS AND CLOSURE OF DEFICIENCY
 REPORTS (DR) YM-96-D-020 AND YM-96-D-025 RESULTING FROM YUCCA
 MOUNTAIN QUALITY ASSURANCE (YMQA) AUDIT YM-ARC-96-03 OF
 KIEWIT/PARSONS BRINCKERHOFF**

The YMQA staff has verified the corrective actions to DRs YM-96-D-020 and YM-96-D-025 and determined the results to be satisfactory. As a result, the DRs are considered closed.

If you have any questions, please contact either Robert B. Constable at (702) 794-5580 or John S. Martin at (702) 794-5591.

Robert B. Constable

Richard E. Spence
 Yucca Mountain Quality Assurance

YMQA:RBC-2754

Enclosure:
 DRs YM-96-D-020 and
 YM-96-D-025

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Recip: NMSS/HLUR

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PERFORMANCE/DEFICIENCY REPORT

1 Controlling Document:
Quality Assurance Requirements and Description (QARD), DOE/RW-0333P, Rev. 5

2 Related Report No.
YM-ARC-96-03

3 Responsible Organization:
Kiewit/Parsons Brinckerhoff (Kiewit/PB)

4 Discussed With:
Jon Christensen

5 Requirement/Measurement Criteria:

1. QARD, Section 9.0, Paragraph 9.2.2, states, in part: "Special process implementing documents shall include or reference:

B. Conditions necessary for accomplishment of the special process. These conditions shall include proper equipment, controlled parameters of the process, calibration requirements, and traceability between the item or product, and individual performing the special process."

(Continued on Page 3)

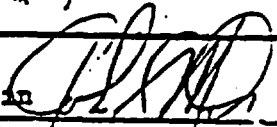
6 Description of Condition:

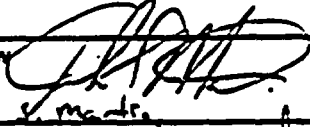
1. Contrary to the above criteria, Kiewit/PB procedures do not require traceability between the item or product and the individual who performed the special process. An example of this deficiency is that of the identification of the welder to the product or item that the welder worked on.

2. MCP-9.0 fails to comply with the QARD. An example of this deficiency is a failure to comply with QARD Section 2.0, specifically Paragraph 2.2.10, for establishing review criteria and for having the Quality Assurance Organization review implementing documents.

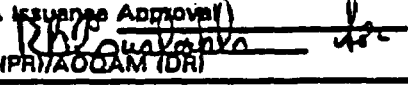
RBC 12-21-95

(Continued on Page 3) (A)

7 Initiator
John S. Martin  Date 12/2/95

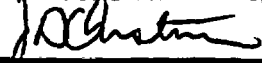
8 QA Review  Date 12/1/95

10 Response Due Date
20 Working Days from Issuance

11 QA Issuance Approval
 Date 12-2-95

12 Remedial Actions:

ITEM 1 SEE PAGE 5
ITEM 2 SEE PAGE 5 AND 8
ITEM 3 SEE PAGE 5
ITEM 4 SEE PAGE 5

13 Remedial Action Response By:
 Date 1/24/96

14 Remedial Action Due Date
ITEM 1 COMPLETE
ITEM 2 2/1/96
ITEM 4 2/29/96
OVERALL 3/29/96

15 Remedial Action Response Acceptance
QAR Date

16 PR Verification/Closure
QAR Date

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DEFICIENCY REPORT

17 Recommended Actions:

1. Perform remedial action to correct the identified deficient conditions.
2. Determine the extent of like deficiencies and document results.
3. Based on the above, perform an impact evaluation and document results.
4. Identify root cause and corrective action to be taken.
5. Determine those actions necessary to preclude recurrence and document results thereof.
6. Evaluate the need to extend the RTN Matrix down into lower level implementing procedures.

18 Investigative Actions:

SEE PAGES 5, 6 AND 7

19 Root Cause Determination:

SEE PAGE 6, GENERIC ISSUE

20 Action to Preclude Recurrence:

SEE PAGE 7

21 Response by:

J.D. Christian
Date 1/24/96

22 Corrective Action Completion Due Date:

FEB 12, 1996

23 Response Accepted

QAR *[Signature]* Date 6-26-86

24 Response Accepted

W.W. Hedden for *Responsible for*
AQQAM *John MARTIN* Date 7/8/96

25 Amended Response Accepted

QAR *N/A* Date

26 Amended Response Accepted

AQQAM Date

27 Corrective Actions Verified

QAR *[Signature]* Date 9/21/86

28 Closure Approved by:

AQQAM *[Signature]* Date 9-30-96

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BLOCK 5: (Continued)

2. QARD, Section 5.0, "Implementing Documents," Section 6.0, "Document Control," and Section 2.0, "Quality Assurance Program" describe those conditions necessary to assure that work is prescribed by, and performed in accordance with written implementing procedures; that these documents, including changes thereto, are reviewed for adequacy.
3. QARD, Section 9.0, Paragraph 9.2.3B, states, in part: "Personnel that perform nondestructive examinations shall be qualified in accordance with American Society for Nondestructive Testing Recommended Practice No. SNT-TC-1A, June 1980 Edition"
4. QARD, Section 5.0, Paragraph 5.2, states: "Work shall be performed with controlled implementing documents."

Paragraph 5.2.1, states, in part: "The type of document to be used to perform work shall be appropriate to the nature and circumstances of work being performed."

BLOCK 6: (Continued)

In addition, QCP-003, Revision 2, "Visual Inspection (Weldments)," Paragraph 3.3 references the generation of implementing documents called "Acceptance Criteria Supplements" (ACS). The generation, review, issuance, and control of ACSs are not controlled in accordance with Kiewit/PB MCPs -5.0, 6.0, and 6.1.

3. Contrary to the above, Kiewit/PB Procedures MCP-9.1 and MCP-9.2 do not establish a written practice, nor are there any implementing documents for training of personnel.
4. Prequalified Joint Welding Procedure Specifications contained within SPP-006, Revision 4, Welding Procedure Specification Manual Welding of Carbon Steel Structural Shapes - AWS D1.1-92 were found to be inappropriate for the work being conducted.

Specifically, the Prequalified Joint Welding Specifications do not contain Material Specifications, Root Treatment, and Preheat and Interpass Temperature requirements. Instead, these requirements are referenced as follows:

Material Specification states, "See Scope above." The scope section of the procedure states: "Shielded Metal Arc Welding of all steels complying with Section 5, Welding Procedure Qualification, with special requirements applicable individually, to each type of structure as defined in AWS D1.1-92 and project drawing details." In review of Section 5 of AWS it was noted that the material specification is not clearly delineated.

Root Treatment states, "Backgouge or Backing bar as required by detail." In review of the Welding Procedure Specification, no detail exists.

Preheat and Interpass Temperature states, "See Appendix II Table 4.3 and Paragraph 7.0 of SPP-005." Paragraph 7.0 is for heat treatment. Paragraph 7.1 contains Preheat and Interpass Temperature; however, Paragraph 7.1.2 of SPP-005 states, in part: "The Welding Procedure Specification for the material welded shall identify the minimum preheating requirements in conformance with AWS D1.1-92, Section 4.2, and engineering specifications." Table 4.3 gives the preheat and interpass temperature for all materials. During interviews with one welder and two inspectors, the preheat and interpass temperature were not readily identified.

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BLOCK 6: (Continued)

Postheat Treatment states: " See SPP-005, Paragraph 7.2." SPP-005, Paragraph 7.2.1 states: "Postweld heat treatment shall be carried out in accordance with AWS D1.1-92 or as required by engineering specification."

During interviews with one welder and two Quality Control Inspectors, it was found that they could not identify the material specification nor the preheat and interpass temperature allowed by the Welding Procedure Specification AWS PP-BO-SM-PQ, Revision 1. Questions about the root Treatment and Postheat Treatment were not asked.

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Kiewit/PB response to DR YMQAD-96-D020

Item 1

MCP-9.0 was revised during the audit to address this issue. Paragraph 3.4.2 was revised to require the application of the welder's stamp adjacent to the weld. The revision also addressed traceability of the other special processes.

Item 2

The revision of MCP-9.0 also addressed this concern. Paragraph 3.4 was changed to require review and control of SPP's in accordance with MCP-5.0 and MCP-6.0 to be consistent with the control placed on other procedures. MCP-5.0 will also be revised to require the same DRR process for SPP's and "Acceptance Criteria Supplements" (ACS) as required for other procedures. Revision will be completed by 2/1/96.

Item 3

MCP-9.1, Qualification and Certification of Nondestructive Testing Level III Personnel, is a written practice for the qualification and certification of Level III personnel. MCP-9.2, Qualification and Certification of Nondestructive Testing (NDT) Level II Personnel, is a written practice for the qualification and certification of Level II personnel. Together MCPs 9.1 and 9.2 constitute K/PB's written practice as is required by SNT-TC-1A-80, part 5 and paragraph 1.4.

Regarding the training of personnel, K/PB does not train NDT personnel for the purpose of qualification and certification. We hire, qualify and certify only personnel that have been previously trained and certified to level II. The training program requirements of SNT-TC-1A have therefore been deleted. This is in accordance with SNT-TC-1A, paragraph 1.4, last sentence which states "In developing a written practice as required in Par. 5, the employer shall review the detailed recommendations presented herein, and shall modify them as necessary to meet particular needs".

Each individual that has been certified by K/PB to NDT Level II or III has been evaluated for prior training and/or experience as allowed by SNT-TC-1A, 6.1 and 6.2 and appropriate K/PB implementing documents (written practice). Evidence of this prior training and/or experience, and the evaluation thereof, is contained in the appropriate certification files. A copy of ASNT's official position on implementation of SNT-TC-1A-80 is attached.

Item 4

AWS D1.1-92, section 5, Qualification, paragraph 5.1.1 addresses prequalified welding procedure requirements. This paragraph invokes footnote 15 at the bottom of the page. Footnote 15 states:

"The Code states all the requirements for prequalified welding. For convenience, Appendix H lists provisions to be included in a prequalified welding procedure specification, and which must be addressed in the fabricator's or contractor's welding program."

A copy of Appendix H is attached for reference. As can be seen the requirements for a contractor's welding program are extensive and complicated. K/PB's Welding Engineer elected to develop a comprehensive welding program because, even though complicated, it will cover all the welding work, both Q and non-Q, conducted by K/PB.

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This Welding Program (SPP-005, SPP-006, SPP-007 and SPP-008) meets all AWS Code requirements for anticipated work at the YMP-ESF Project. This includes steel sets, structural steel, TBM assembly (which includes material up to 4 in. thick, quenched and tempered steels, hard surfacing, etc.) and associated repair requirements. This Welding Program was submitted to REECo's Welding Engineer and the A/E for approval and was found to be in compliance with Code and Project requirements.

Because the K/PB weld procedures are necessarily complex, welders and QC inspectors should not be expected to provide immediate responses to questions related to a specific welding task not currently being implemented. Post-audit interviews with K/PB personnel that were contacted during the audit have identified some differences of opinion regarding the adequacy of responses and conclusions expressed in this Deficiency Report. K/PB firmly believes, based upon experience and past audit and surveillance results, that all QARD-related welding conducted has met applicable AWS requirements. The few problems that have been identified were not related to the complexity of the procedures or concerns expressed in this Deficiency Report.

K/PB does agree that the welding program requires the user, in some limited areas, to refer to other sources such as AWS for required information. However, it is also true that the Kiewit/PB Welding Engineer, the author of the program, constantly monitors the application of the program and is available to aid the users in interpretation of requirements. Although we don't believe that a deficiency exists, we do understand the concerns expressed by the auditor. As a result of these concerns, K/PB will develop prequalified Welding Procedure Specifications (WPS) for each joint design related to QARD work and append these WPS's to the applicable SPP. These WPS's will clearly address the welding details which this DR has identified as deficiencies (material requirements, preheat and interpass temperature etc.) WPS SM-F-PQ (an unreviewed draft) is attached as an example.

Generic issue

The number of procedural deficiencies identified by this DR and during the audit, many minor and some not so minor, has created a concern to Kiewit/PB. As a result, we have performed an investigation to determine the root cause of the procedural problem. The following procedure errors were specifically evaluated during the investigation:

OCP-006 & OCP-010 Did not clearly define the duties and inspection attributes for the QC Inspector during anchorage and proof tests of rockbolts.

SPP-003 Yoke calibration and light intensity requirements not in accordance with ASTM Standard as required.

OCP-008 Criteria for steel set base plate flange offset and criteria for snug tightness of bolted connections were not included in procedure. Although the ECR which prompted the change was, in fact, evaluated by the procedure developer, not all of the changes required by the ECR were incorporated in the revision to OCP-008.

MCP-4.0 & MCP-7.1 Although there were many DOE comments regarding these two procedures, none were considered by Kiewit/PB as being in violation of QARD requirements. The investigation did reveal, however, that these procedures are unclear in many areas and in some cases do not reflect the actual process being used although the actual

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process exceeds the procedure requirements.

MCP-9.0 The procedure did not include traceability requirements for welders and did not require the same level of control of SPP's as other procedures.

This investigation has revealed that there is no one cause which can be considered the root of the problem but rather three causes, all equally important. Regardless of the reasons, excuses, and contributing factors, the following are considered the root causes of the problem:

1. Lack of attention to detail by the procedure developers
2. Inadequate procedure reviews
3. The absence of an impact evaluation of Revision 5 of the QARD

Although the root causes have been identified, we feel that the following contributing factors deserve mentioning:

1. During transition from REECo to Kiewit/PB, we were required to develop or modify approximately 45 of our procedures due to our scope change. This procedure development and revision process was performed in a very short time frame (one month) which resulted in excessive pressure being placed on the procedure developers and reviewers. The pressure generated due to the time constraint took its toll on the quality of the procedure developer's attention to detail as well as on the quality of the reviews.
2. In addition to the procedure development process due to scope changes, we also updated all of the QARD related procedures to be in compliance with the DOE comments regarding our RTN matrix versus Revision 5 of the QARD. This update was performed during the same short time frame, generating the same pressure and taking the same toll on the quality of the procedures.

Action to Preclude Recurrence

1. Improve performance in procedure development and reviews by conducting face to face training emphasizing the importance placed by management on verifying that our procedures are written to be in full compliance with design documents and the QARD.
2. Perform additional indoctrination regarding the process and requirements for initiating a formal impact evaluation.

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Remedial Actions

Following the completion of the training and indoctrination mentioned under "Action to Preclude Recurrence", the following remedial actions will be performed:

1. Initiate a formal impact evaluation of Revision 5 of the QARD.
(To be completed by 2/15/96)
2. Revise all of the procedures identified during the audit to address the specific issues with which we have agreed in our formal responses.
(To be completed by 2/29/96)
3. Review all procedures (MCP's, QCP's, ACS's, SPP's, TCP's, VTP's) to verify that upper tier requirements have been adequately described.
(To be completed by 3/29/96)
4. A review of all QCP's and TCP's has been performed to verify that work criteria and acceptance criteria, required by the specifications, are included in the procedures. This action is in response to YMQAD-96-D021 and K/PB 96-D018 R1. Any revisions required by this review will be completed by 2/29/96.
5. Following the completion of the above remedial actions, Kiewit/PB will evaluate the impact, if any, on previously performed work.

ASNT Position Paper on the Use of SNT-TC-1A and the ASNT Level III Certification Programs

By the ASNT Board of Directors

Introduction

This document was originally issued in *Materials Evaluation*, May 1978, p. 21, relative to the 1975 edition of SNT-TC-1A. It is updated here to reflect the 1980 edition of SNT-TC-1A. Following is the official ASNT position on the use and application of ASNT Recommended Practice No. SNT-TC-1A (1980 Edition), "Personnel Qualification and Certification in Nondestructive Testing" (Reference 1) and the ASNT Level III Certification Program (References 6-8). Both programs have been adequately documented (see References 1-8). The salient features are reviewed below for background.

ASNT Official Position on SNT-TC-1A

SNT-TC-1A is published to serve as a *guideline* to employers in establishing their own written practice for the qualification and certification of their NDT personnel. It is *not intended to be a strict specification*. The intent is to provide guidelines for proficiency levels required for personnel involved in nondestructive testing.

The guidelines are clearly delineated in the following paragraphs of SNT-TC-1A, June 1980 edition:

1. Employer Certification—Front Cover, 2.1(3), and 9.1
2. Written Practices—5.1, 5.2, and 1.4
3. Basic Levels of Qualification—4.3(1), 4.3(2), and 4.3(3)
4. Education, Training, and Experience—6.1, 6.2, and 6.3
5. Examinations—8.1, 8.2, and 8.3
6. Certification—9.1, 9.2, 9.3, 9.4, 9.5, 9.6, and 9.7.

Of these, 5.1, 1.4, 9.1, and 9.4 are basic. They state that the employer shall establish a written practice (5.1), the written practice shall reflect the particular needs of the employer (1.4), certification of all levels of NDT personnel is the responsibility of the employer (9.1), and the employer has the option of using an outside agency to provide Level III services for training and examining, but certification remains the re-

sponsibility of the employer (9.4).

ASNT Level III Certification Program

The Board of Directors, in establishing this program, offered to employers an optional service in accordance with 9.4 of SNT-TC-1A, which is consistent with Level III qualification recommendations of 4.3(3) of SNT-TC-1A. Further, certification by ASNT was defined to be "a certification that the records of an individual indicate attainment of the qualifications required by Part A of the program; or satisfactory completion of a written examination under Part E of the program."

The program had two phases:

1. Phase One: ASNT Level III Certification without a written examination in compliance with the stringent requirements of Parts A and C of the program (see Reference 6). This one time only phase of the program closed on February 28, 1977.
2. Phase Two: An ASNT Level III Examination Service is provided at various locations in NDT methods covered by SNT-TC-1A.

Official Position on ASNT Level III Certification Program

The official position on ASNT Level III Certification is as follows:

1. The ASNT Level III Certification Program is in compliance with SNT-TC-1A guidelines.
2. Individuals certified to Level III in any NDT method by ASNT are considered to have met the guidelines of SNT-TC-1A 8.3.3(1) (Basic Examination) and 8.3.3(2) (Method Examination). Where proof of experience exists, and is documented with or without examination, in the preparation of acceptable NDT procedures, codes, standards and specifications and in the evaluation of the test results, and is acceptable under the buyer-seller agreement, then the individual shall be considered to

have met the guidelines of SNT-TC-1A Paragraph 8.3.3(3) (Specific Examination).

perience, and education as defined in 4.3(3) and 6.

These options are shown graphically in the accompanying figure.

Certification Options.

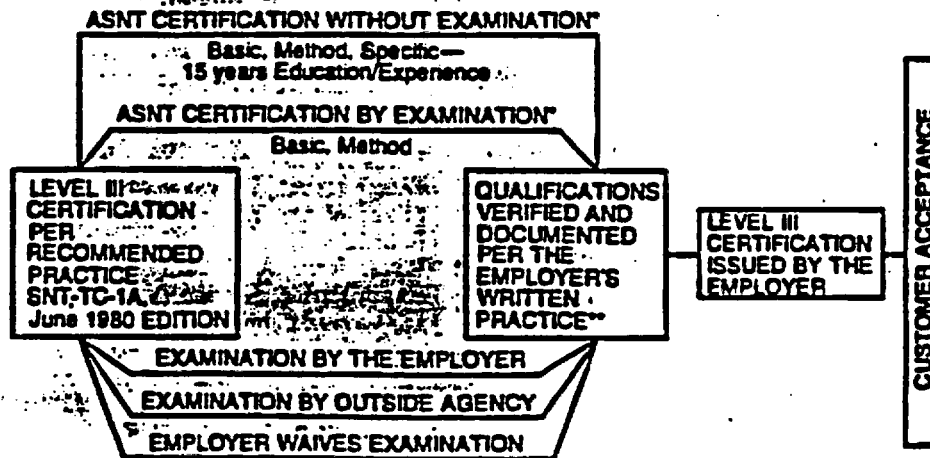
Both SNT-TC-1A and the ASNT Level III Certification Program offer the employer several options for fulfilling certification responsibilities:

1. Depending on the path taken to ASNT Level III Certification (see figure below), incorporate acceptance of ASNT Level III Certification into the employer's own written practice, as permitted in 9.4 of SNT-TC-1A for meeting any or all recommendations of 8.3.3 (Basic, Method, and Specific), and assigning grading weight factors based on satisfactory performance in accordance with 8.4.3 and 8.4.4.
2. Do the same utilizing another outside agency acceptable to the employer's clientele.
3. Provide his own documented examination program acceptable to his clientele.
4. Incorporate into his written procedure provisions for waiver of examination as permitted in 8.3.4 of SNT-TC-1A based on demonstrated ability, achievement, ex-

References

1. ASNT Recommended Practice No. SNT-TC-1A (1980 Ed.), "Personnel Qualification and Certification in Nondestructive Testing."
2. SNT-TC-1A, 1975, *Materials Evaluation*, May 1975, p. 29A-36A.
3. "Historical Review of Personnel Training and Certification," *Materials Evaluation*, May 1975, p. 37A.
4. "Report of Ad Hoc Committee to Study Training and Certification," *Materials Evaluation*, May 1975, p. 38A-40A.
5. "ASNT President Lautzenheiser's Report on Implementation of ASNT Level III Program," *Materials Evaluation*, May 1976, p. 11A-14A.
6. "ASNT Level III Program Details, Parts A, B, C, D," *Materials Evaluation*, August, 1976, p. 1A-12C.
7. "ASNT Level III Program Details, Part E," *Materials Evaluation*, October 1979, p. 29.
8. "ASNT Level III Certification by Examination," *Materials Evaluation*, Redi-Reference 1979, p. 75-92.

These references are available from ASNT Headquarters, Certification Dept., 3200 Riverside Drive, P.O. Box 21142, Columbus, OH 43221, (614) 488-7921.



* Certificate issued to individual.

** This documentation as recommended in paragraphs 5, 8.3.3, 8.3.4, and 9 of the SNT-TC-1A, 1980 edition.

Appendix H

Contents of Prequalified Welding Procedure Specifications

(Nonmandatory Information)

(This Appendix is not a part of ANSI/AWS D1.1-92, *Structural Welding Code—Steel*, but is included for information purposes only.)

Prequalified welding requires a written WPS addressing the following Code subsections as applicable to weldments of concern. In addition to the requirements for a written WPS, this Code imposes many other requirements and limitations on prequalified welding. The organization using prequalified welding must comply with all the relevant requirements.

The specification of the WPS may meet the users needs. Items such as assembly tolerances may be referenced.

WPS

- 1.3.1, 1.3.3 Processes Permitted
- 2.3.1.4 Prequalified Joints
- 2.7.1.1 and 2.7.1.2 Fillet Welds
- 2.8.1, 2.8.2, 2.8.4, 2.8.6, 2.8.8 Plug and Slot Welds
- 2.9 Complete Joint Penetration Groove Welds
- 2.10 Partial Joint Penetration Groove Welds
- 2.11 Skewed T Joints
- 3.1.3 Temperature
- 3.2.1, 3.2.2 Base Metal Preparation
- 3.3 Assembly
- 3.8 Peening
- 3.11.1 In Process Weld Cleaning
- 3.13.1, 3.13.2, 3.13.3 Groove Welding Backing
- 4.1.1 Matching Filler Metal
- 4.1.2 Filler Metal Limitations
- 4.1.4 A242 and A588
- 4.1.5
- 4.2 Preheat
- 4.3 Heat Input*
- 4.5.1 Electrodes
- 4.6 Except 4.6.1 and 4.6.10 SMAW Procedures
- 4.7.1, 4.7.3, 4.7.4, 4.7.6 SAW
- 4.8.1 SAW As Applicable
- 4.9.2, 4.9.3, 4.9.4

- 4.10.2, 4.10.3, 4.10.4, 4.10.5, 4.10.6 (except 4.10.6.1)
- 4.11.2, 4.11.3, 4.11.4, 4.11.5, 4.11.6 (except 4.11.6.1)
- 4.12.1, 4.12.2 GMAW, FCAW
- 4.13 Shielding Gas
- 4.14.1, 4.14.2, 4.14.4 GMAW, FCAW
- 4.21 Plug Welds
- 4.22 Slot Welds
- 5.1.2 and Specific Portions of 5.5 Variables
- 7.5.5 SMAW Studs
- 7.7.5
- 8.2.1, 8.2.2, 8.2.3.2, 8.2.3.3, 8.2.4*, 8.2.5 } Base Metals
- 9.2.1, 9.2.2, 9.2.3, 9.2.4.2, 9.2.5*, 9.2.6 }
- 10.2.1, 10.2.2, 10.2.4*, 10.2.5

*Limitations

The provisions of this Code are not intended for use with steels having a specified minimum yield point or yield strength over 100 000 psi (690 MPa).

All groove and fillet weld procedures for weld metal and base metal with a minimum specified yield strength of 90 000 psi (620 MPa) or higher shall be qualified to the satisfaction of the Engineer prior to use by tests as provided in 5.2.

**WELDING PROCEDURE SPECIFICATION (WPS) #SM-F-PQ
PREQUALIFIED**

This WPS is applicable only to Welding of Steel Sets at the Yucca Mountain Project and must be used in conjunction with AWS D1.1-92 and SPP-005, SPP-006 and SPP-007

Company Name Kiewit/PB
Welding Process(es) SMAW
Supporting PQR No.(s) N/A

Identification # SM-F-PQ
Revision 0 Date 12/18/95 By T. Tomek
Authorized by _____ Date 12/18/95
Type — Manual Semi-Automatic
Machine Automatic

JOINT DESIGN USED

Type: Single Double Weld
Backing: Yes No
Backing Material N/A
* Root Opening 0"-3/16" Root Face Dimension N/A
Groove Angle N/A Radius (J-U) N/A
Backgouging: Yes No Method N/A

POSITION

Position of Groove N/A Fillet All
Vertical Progression: Up Down

BASE METALS

Material Spec. A-36, A-572 GR50
Type or Grade A-36 to A-36 or A-572 GR50
Thickness: Groove N/A Fillet 3/4" max.
Diameter (Pipe) N/A

ELECTRICAL CHARACTERISTICS

Transfer Mode (GMAW):
Short-Circuiting Globular Spray
Current: AC DCEP DCEN Pulsed
Other N/A
Tungsten Electrode (GTAW):
Size N/A
Type N/A

FILLER METALS

AWS Specification AWS 5.1 and 5.5
AWS Classification E7018

TECHNIQUE

Stringer or Weave Bead Either or Both
Multi-pass or Single Pass (per side) Multi or Single
Number of Electrodes Single
Electrode Spacing: Longitudinal N/A
Lateral N/A
Angle N/A
Contact Tube to Work Distance N/A
Peening Intermediate layers only
Interpass Cleaning Slag Hammer, Chisels, Brushes, Light weight Vibrating Tools.

SHIELDING

Flux N/A Gas N/A
Composition N/A
Electrode-Flux (Class) N/A Flow Rate N/A
Gas Cup Size N/A

PREHEAT

Preheat Temp., Min. Below 32°F - 70°F min.
Interpass Temp., Min. N/A Max. N/A

POSTWELD HEAT TREATMENT

Temp. N/A
Time N/A

* Weld size must be added over 1/16" Root opening.

WELDING PROCEDURE

Pass or Weld Layer(s)	Process	Filler Metals		Current		Volts	Travel Speed	Joint Details
		Class	Diam.	Type & Polarity	Amps or Wire Feed Speed			
As Required	SMAW	E7018	3/32"	DCEP	70-110	17-25	2-7	See Page 2 for details
	SMAW	E7018	1/8"	DCEP	90-150	18-25	2-9	
	SMAW	E7018	5/32"	DCEP	110-230	22-26	3-10	
	SMAW	E7018	3/16"	DCEP	150-300	22-26	4-14 I.P.M.	

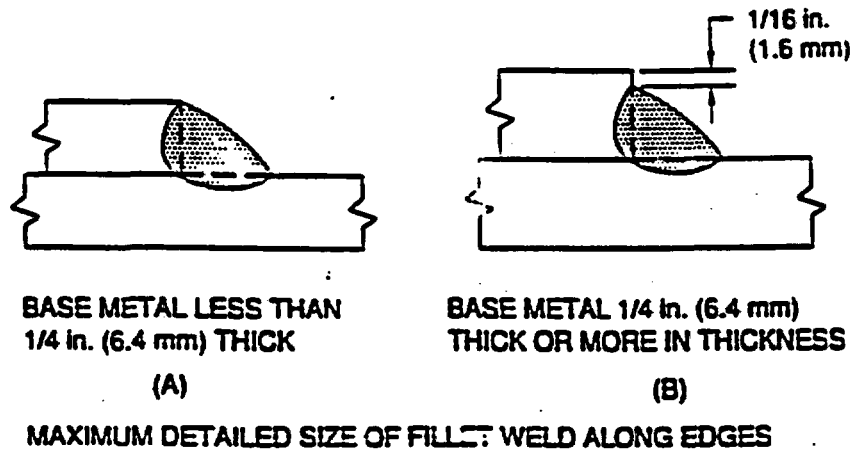
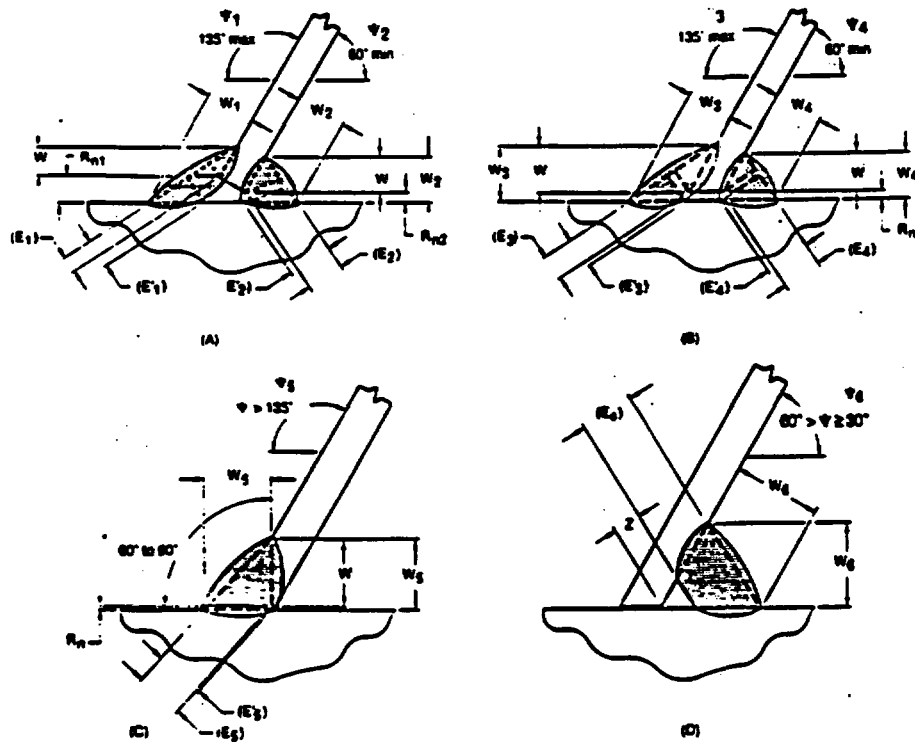


Figure 2.3 — Details for Prequalified Fillet Welds



Notes:

1. $(E)_1(n)$, $(E)_2(n)$ = Effective throats dependent on magnitude of root opening (R_n). See 3.3.1 (n) represents 1 through 5.
2. t = thickness of thinner part.
3. Not prequalified for gas metal arc welding using short circuiting transfer. Refer to Appendix A.
4. Figure D. Apply Z loss factor of Table 2.4 to determine effective throat.
5. Figure D, not prequalified for under 30° . For welder qualifications, see Table 10.5, Column 10.

Figure 2.6 — Details for Skewed T-Joints (see 2.11.1)

VERIFICATION OF CORRECTIVE ACTION
FOR DEFICIENCY REPORT (DR) YMQAD-96-D020

Verification of corrective action ITEMS aligns with the ITEMS within the accepted response from Kiewit/Parsons Brinckerhoff (K/PB).

ITEM 1

Revision of MCP-9.0, to address the traceability between the item or the product and the individual who performed the special process.

K/PB revised MCP-9.0, to stipulate traceability within revision 6, paragraph 3.4.2. This item was found to be acceptable.

ITEM 2

Revision of MCP-9.0, to address the review and control of SPPs in accordance with MCP-5.0 and MCP-6.0.

K/PB revised MCP-6.0, to address the review and control of SPPS within revision 6, paragraph 3.4. This item was found to be acceptable.

ITEM 3

Per discussions with R. Spence K/PB is not required to establish a training program for the training of NDE personnel. No further action is required for this item per R. Spence.

ITEM 4

Revise Weld Procedure Specifications (WPSs) to address:

- Material Requirements
- Pre-Heat Temperature
- Interpass Temperature

Special Process Procedure (SPP) -006 was revised to address the above attributes via revision to weld procedures specifications SM-F-PQ and FC-F-PQ contained in SPP-006, Revision 7, effective 9/27/96.

ACTION TO PRECLUDE RECURRENCE:

- 1) Training was accomplished as committed on February 15 and 16, 1996. Reviewed

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PERFORMANCE/DEFICIENCY REPORT

1 Controlling Document:
MCP-11.0, "Test Control"

2 Related Report No.
YM-ARC-96-03

3 Responsible Organization:
Kiewit/Parsons Brinckerhoff

4 Discussed With:
Howard Cox

5 Requirement/Measurement Criteria:
MCP-11.0, "Test Control," Revision 3, Section 1, states:

"The purpose of this procedure is to provide instruction for the development of implementing procedures necessary for the conformance/performance verification testing. This procedure is applicable to the planning and execution of tests that are used to verify conformance of an item to specified requirements, or to demonstrate satisfactory performance for service. Examples of such tests include ... production tests, construction tests ..."

6 Description of Condition:

The following procedures were identified by the QC Manager as implementing QARD, Section 11.0, "Test Control:"

- QCP-006, Williams B7X Hollow Core Rockbolt Installation Inspection and Testing
- QCP-010, Super Swellex Rockbolt Installation Inspection and Testing
- QCP-014, Bromide Ion (Br) Tracer Water Sampling & Testing
- QCP-015, Laboratory Curing, Compression Testing, and Reporting For Cementitious Materials
- TCP-2.21, Diesel Engine Exhaust Emission Testing, Monitoring, and Control Procedure
- TCP-2.28, Rock Bolt Pull Testing Procedure

Of these procedures only one procedure, QCP-15, actually references and incorporates those requirements. The other procedures not only do not reference MCP-11.0, but they do not implement the requirements.

(Continued on Page 3)

7 Initiator

Alan W. Rabe

Alan W. Rabe Date 12/21/95

9 QA Review

QAR

Alan W. Rabe Date 1/4/96

10 Response Due Date

20 Working Days from Issuance

11 QA Issuance Approval

QAR (PR)/AQQAM (DR)

[Signature] Date 12/21/95

12 Remedial Actions:

SEE PAGES 4 & 5

13 Remedial Action Response By:

[Signature] Date 1/23/96

14 Remedial Action Due Date

SEE PAGES 4 & 5 Date

15 Remedial Action Response Acceptance

QAR *[Signature]* Date 3/12/96

16 PR Verification/Closure

QAR N/A Date

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17 Recommended Actions:

Properly reference MCP-11.0 in each procedure that is subject to MCP-11.0 and ensure its requirements have been incorporated into those procedures and implemented.

18 Investigative Actions:

SEE PAGE 5

19 Root Cause Determination:

SEE PAGE 5

20 Action to Preclude Recurrence:

SEE PAGE 5

21 Response by:

[Signature] Date 1/23/96

22 Corrective Action Completion Due Date:

SEE PAGE 5

23 Response Accepted:

QAR *[Signature]* Date 3/12/96

24 Response Accepted:

AOQAM *[Signature]* Date 3-19-96

25 Amended Response Accepted:

QAR N/A Date

26 Amended Response Accepted:

AOQAM N/A Date

27 Corrective Actions Verified:

QAR *[Signature]* Date 9/25/96

28 Closure Approved by:

AOQAM *[Signature]* Date 9-30-96

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BLOCK 6: (Continued)

For example, TCP-2.21 does not meet MCP-11.0 in the following respects:

- a. Qualification of personnel is not addressed.
- b. Test equipment is not specified.
- c. A somewhat arbitrary standard is identified, but there is a lack of clarity as to how to apply the standard (i.e. to each point or the average).
- d. The data at some speeds exceed the standard, but there is no documentation of whether this condition was identified or addressed. The procedure does not identify how to resolve an anomaly.
- e. The procedure requires a reading of emissions at five different speeds. Actual practice has been to take five readings at each speed and then to average them to report the measurement for each speed. The test should clarify whether this is acceptable.

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Remedial Actions

Kiewit/PB agrees that all of the procedures listed in this finding, with the exception of TCP-2.21, Diesel Engine Exhaust Emission Testing, should implement the requirements of MCP-11.0. Kiewit/PB will conduct a review of these procedures to determine if they adequately address the MCP-11.0 requirements. This review along with any required procedural revisions will be completed by March 1, 1996.

The requirements for diesel engine exhaust emission testing are contained in Specification Section BAB000000-01717-6300-01501, Paragraph 3.01S. This Paragraph contains the following note:

NOTE: The tools, materials, instruments and laboratories used for implementing the controls in Paragraph S are not "Q".

Based upon this note it is clear that MCP-11.0 does not apply. The following are responses to the other issues related to TCP-2.21:

a. Qualification of personnel

Based on the specification note quoted above, no special qualification requirements, other than training to the procedure, are required. This conclusion is based upon the fact that were a laboratory conducting the testing, none of the QARD requirements related to procedures, calibration, training or personnel qualification would be required. It was originally envisioned that the testing would be conducted by an outside laboratory rather than Kiewit/PB personnel.

b. Test equipment not specified

It should be noted that this procedure has been submitted to the A/E and approved by them as being adequate to meet specification requirements. Never-the-less, Kiewit/PB will revise the TCP to either specify the type of test equipment to be used or to record the make and model number of instruments used on the test reports.

c. A somewhat arbitrary standard is identified, but there is lack of clarity as to how to apply the standard (i.e. to each point or the average).

The procedure will be revised to clarify this area.

d. The data at some speeds exceed the standard, but there is no documentation of whether this condition was identified or addressed. The procedure does not identify how to resolve an anomaly.

The procedure will be revised to address how test anomalies are handled. Previous

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testing results will be reviewed and resolved in accordance with the revised procedure requirements.

- e. The procedure requires a reading of emissions at five different speeds. Actual practice has been to take five readings at each speed and then average them to report the measurement for each speed. The test should clarify whether this is acceptable.

The procedure will be clarified to address this practice.

The revisions to TCP-2.21 will be done by February 29, 1996.

Investigative Actions:

Test data gathered as a result of the implementation of TCP-2.21 shall be reviewed and evaluated by Kiewit/PB QA to determine compliance with the revised requirements of the procedure and any required corrective actions identified. This evaluation will be complete by March 15, 1996.

Root Cause Determination:

See root cause evaluation for YMQAD-96-D020 for procedural problems.

Action to Preclude Recurrence:

See YMQAD-96-D020 for actions to preclude recurrence.

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Verification Actions conducted by Daniel J. Tunney

- a. Verify that a review of procedures has been conducted by Kiewit/PB to determine whether they adequately address the MCP-11.0 requirements.

Results: The review of the procedures is documented on the following:

1. Kiewit/PB QC:MEM:96-082, Howard R. Cox to Kevin C. Krank, dated 2/27/96
2. Kiewit/PB QC:MEM:96-081, Howard R. Cox to V. J. Barish, dated 2/27/96.

The review results indicate that only QCP-014, QCP-015 and TCP-2.28 are subject to MCP-11.0 requirements, and that these require revision to meet the requirements of MCP-11.0.

- b. Verify that required procedure revisions have been completed.

Results: Reviewed QCP-014, Rev. 6, QCP-015, Rev. 3, and TCP-2.28, Rev. 5. Also reviewed VTP-004, Rev 1 since this provides the personnel qualification requirements for tests conducted per TCP-2.28. These procedures are acceptable.

- c. Verify that the note in Specification Section BAB000000-01717-6300-01501 indicates that the tools, materials, instruments, and laboratories used for implementing the controls in paragraph S are not "Q."

Results: Verified that this change was incorporated by ECR: E96-0060 against revision 4 of Specification BAB000000-01717-6300-01501.

- d. Verify that TCP-2.21 has been revised to either specify the type of equipment to be used or to record the make and model number of instruments used on the test reports.

Results: Verified that TCP-2.21, Revision 5, Exhibit 5.1 includes blocks for recording the make and model of the test instruments to be used.

- e. Verify that TCP-2.21 has been revised to clarify how to apply the standard (i.e., to each point or the average).

Results: Verified that TCP-2-21, Revision 5, 3.3.2 clarifies the method for standard development.

- f. Verify that TCP-2.21 has been revised to clarify how to resolve test anomalies.

Results: Verified that TCP-2-21, Rev. 5, 3.4.3 describes how to handle anomalies.

- g. Verify that previous testing results have been reviewed and resolved in accordance with the revised procedure requirements.

Results: Previous testing results have been reviewed and resolved in accordance with the revised procedure requirements. A listing of Examples of Stationary Diesel Emission Test Reports reviewed is shown on page 7.

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EXAMPLES OF STATIONARY DIESEL EMISSION TEST REPORTS REVIEWED

Work Package #	Manufacture	Model	Serial Number	Test Date	Date of Report
2.22.2EE	Brookville	15 Ton Locomotive	DEUTZ F8413 FW S/N 6851296	8/5/96	8/6/96
2.22.2CC	Grove	Platform Lift Grove	DEUTZ FZL511 S/N N/A	6/5/96	8/5/96
2.22.2CC	Plymouth	15 Ton Locomotive	DEUTZ F8L1413 FW S/N 6851037	6/10/96	8/5/96
2.22.2T	EIMCO	92554D Mucker	CAT 3306PC S/N 66D37616	1/18/96	5/10/96
2.22.2N	Brookville	15 Ton Locomotive	DEUTZ F8L413 FW S/N 6851207	11/6/95	5/10/96
2.22.2F	Brookville	15 Ton Locomotive	DEUTZ F8L413 FW S/N 6851207	3/4/95	5/10/96
2.22.2F	Atlas Copco	Drill Jumbo 226	DEUTZ F6L912W S/N 7261295	5/12/95	5/10/96
2.22.2F	Grove	AP308 Crane	CUMMINS 4B39L	6/20/95	5/10/96

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h. Verify that TCP-2.21 has been revised to clarify whether it is acceptable to take five readings at each speed and then average them to report the measurement for each speed.

Results: Verified that Sections 3.3.2, 3.3.3 and Exhibit 5.1 clarify that it is acceptable to take five readings at each speed and then average them to report the measurement for each speed.

i. Verify that test data gathered as a result of the implementation of TCP-2.21 has been reviewed and evaluated by Kiewit/PB QA to determine compliance with the revised requirements of the procedure and any required corrective actions have been identified.

Results: The results of the Kiewit/PB QA review are documented on Kiewit/PB Interoffice Memorandum DN 96-D025, dated 3/15/96, S. F. Shuerman to V. J. Barish.

j. Verify that Root Cause and Action to Preclude Recurrence for YMQAD-96-D20 have been completed.

Results: This action has been verified as a part of YMQAD-96-D20.

Personnel Contacted during verification: S. F. Schuermann, K/PB and K. C. Krank, K/PB

Overall results: Satisfactory

Daniel J. Tunney
Daniel J. Tunney, QAR

9/25/96
Date