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 Document Control Branch (Document Control Desk)

SUBJECT: Forwards proposed change to FSAR Section 3.8 re design of
 Category I structures. Change will delete Rev 1 to
 AWS D.1.1-1972 visual acceptance criteria for structural
 weld Categories A, B, D & D.

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Docket Nos. STN 50-528/529/530

September 22, 1987

161-00519-JGH/SGB

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

ATTN: Document Control Desk

Reference: Letter dated June 26, 1985 from the NRC to the Nuclear
Construction Issues Group (NCIG), Subject: Visual Weld
Acceptance Criteria (VWAC) for Strucural Welding at Nuclear
Power Plants, NCIG-01 Revision 2

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Submittal for approval in accordance with 10CFR 50.54(a)
File: 87-005-419.05; 87-A-056-026

In accordance with 10CFR 50.54(a), ANPP is submitting a proposed change to PVNGS FSAR section 3.8, Design of Category I Structures (refer to Attachment 1). This change will delete AWS D.1.1-1972, Rev. 1, 1973 (Structural Welding Code) visual acceptance criteria for structural weld categories A, B, C and D, and replace it with the acceptance criteria of Nuclear Construction Issues Group Document NCIG-01, Revision 2. This is a technically acceptable approach that has been approved by the NRC (refer to Attachment 2), and is being adopted without exception by ANPP.

In accordance with 10CFR 170.12(e), the application fee of \$150.00 is being forwarded to the USNRC License Fee Management Coordinator.

If you have any questions, please contact Mr. W. F. Quinn of my staff.

Very truly yours,

J. G. Haynes
Vice President
Nuclear Production

JGH/SGB/lis

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Attachment to
161-519-JGH/SGB

ATTACHMENT 1

PROPOSED CHANGES
TO
PVNGS FSAR

Welding and the acceptance criteria for visual inspection of welding are in accordance with AWS D1.1-72, Rev. 1, 1973 with clarifications and changes identified in Section 3.8.1.6.6.1.A.

3.8.1.6.6.1 Structural Steel Construction. For Steel construction procedures are as follows.

A. Welding and acceptance criteria for visual inspection of welding is per the Structural Welding Code (AWS D1.1-72, Revision 1, 1973) with the following clarifications and changes:

1. Weld joint classification is based upon suitability for service in accordance with the following categories:
 - a. Category A Joints are part of the main building frame and carry principle design loads.
 - b. Category B Joints are connections between main building frame and miscellaneous metal.
 - c. Category C Joints are not part of the main building frame, but rather provide auxiliary support or framing for systems, components and equipment. These joints are within the miscellaneous metal category, and shall include, but are not limited to, pipe supports (beyond the scope of ASME Codes), stairways, embedments, HVAC duct supports, instrument supports and electrical raceway and supports (except where unistrut is used).
 - d. Category D Joints are not part of the building frame, or auxiliary support system but rather perform a passive or inactive

DESIGN OF
CATEGORY I STRUCTURES

function. These joints are within the miscellaneous metal category and shall include, but are not limited to, doors, windows, hatch covers and frames, ledger angles, handrails and gratings.

- e. Category E Joints are limited to welds, used in ductwork welding of thin walled gauge steel, whose classification is not specifically covered by the Structural Welding Code.

2. 'Insert'

3.6.

Paragraph 3.1.4 is clarified as follows:

For category
E joints

- a. Weld sizes specified in the drawings are considered nominal. Deviations of up to minus 1/32-inch for the entire weld length are considered as meeting the weld size requirement.
- b. The fillet leg dimension may not under run the specified weld size by more than 1/16-inch for more than 10 percent of the weld length. For flange-to-web joints, the undersize may not be within two flange thicknesses of the weld end.
- c. Fillet welds exceeding the specified size are acceptable, as long as, the oversized weld does not interfere with mating parts and there is no evidence of excessive distortion.

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'Insert'

The acceptance criteria for visual inspection of category A, B, C, and D joints is per Nuclear Construction Issues Group Document, NCIG-01, Revision 2.

DESIGN OF
CATEGORY I STRUCTURES

- d. Fillet weld lengths in excess of those shown on the design drawings are acceptable.
- e. Where intermittent fillet welds are specified on the design drawings, a continuous weld of the same size is acceptable.

4. ~~7~~. Paragraph 4.9.2 is replaced as follows:

All electrodes having low-hydrogen coverings conforming to AWS A5.1 are purchased in hermetically-sealed containers. If the hermetically-sealed container shows evidence of damage, the electrodes are dried prior to use. Immediately after the opening of the hermetically-sealed containers, electrodes are stored in ovens held at a temperature of 200F minimum. The E70XX electrodes that are not used within 12 hours, E80XX within 2 hours, E90XX within 1 hour, E100XX and E110XX within 1/2 hour after the opening of the hermetically-sealed container or removal of the electrodes from a

DESIGN OF
CATEGORY I STRUCTURES

drying or storage oven are redried for 8 hours at a temperature of 200F minimum prior to reissue. Electrodes which have been wet are not used. Heated rod cans are not required when rod is used within the specified time.

5. ~~g.~~

In Table 4.2, the governing thickness to determine preheat requirements for fillet welds shall be the weld throat thickness.

6. ~~g.~~

Paragraph 3.6.4 is replaced as follows:

For category
E joints

- a. ~~For all structural steel welded connections, the undercut shall not exceed 1/32 inch unless noted otherwise.~~
- b. ~~For Category C Joints undercut (underfill) not exceeding 1/32 inch may be acceptable for the full length of the weld. Undercut not exceeding 1/16 inch may be accepted providing the width is greater than the depth and does not have an acute intersection at its root. The accumulative length of 1/16 inch undercut shall not exceed 50 percent of the weld length. For members welded from both sides the cumulative undercut depth or length shall not exceed the criteria.~~
- c. ~~For Category D and E Joints,~~ ^u undercut shall not exceed 50 percent of the material thickness.

7. ~~g.~~

Paragraph 3.6.6 is replaced as follows:

For category
E joints,

Overlap/rollover may not exceed 1/8-inch.

8. ~~g.~~

Paragraph 3.6.1 is replaced as follows:

The face of fillet welds may be slightly convex, flat, or slightly concave. The convexity height

For category
E joints,

DESIGN OF
CATEGORY I STRUCTURES

shall not exceed 1/8-inch. Concavity shall not reduce the weld throat beyond that required for weld size.

~~8. Paragraph 8.15.1.3 is replaced as follows:~~

~~a. For Category A and B Joints, the weld may have an underfilled crater, provided the underfill depth does not exceed 1/32 inch, and the crater has a smooth contour blending gradually with the adjacent weld and base metal without acute notches.~~

~~b. For Category C and D Joints, underfilled groove weld craters shall be accepted provided the depth of underfill is 1/16 inch or less. Underfilled single-pass fillet weld craters shall be accepted provided the crater length is less than 10 percent of the weld length. On multi-pass fillet weld crater depth 1/16 inch or less shall be accepted.~~

9. Paragraph 8.15.1.5 is replaced as follows:

a. For Category A, B, C and E Joints, the welds may contain a maximum of 5 percent, by surface area, unaligned, unclustered porosity.

~~b. For Category D Joints, porosity is not a criterion for rejection.~~

~~10. Paragraph 3.10.1 is clarified as follows:~~

~~For Category D Joints, slag inclusions are not a criterion for rejection.~~

10. 11.

Welding shall be performed only by welders or welding operators who have been qualified in

accordance with Section 5 of the Structural Welding Code, except for the following.

- a. Construction aids defined as temporary pipe supports, lifting eyes, construction bracing, supports for concrete embeds and other similar material which may be attached to structural or miscellaneous steel and are not shown on design drawings: Welders or welding operators may be qualified to AWS or ASME Section IX requirements.
- b. Welders performing welding on pipe supports (beyond the scope of ASME codes), embedments, or instrument supports may be qualified to AWS or ASME Section IX requirements.
- c. The Structural Welding Code groove plate test in the 3G and 4G positions shall qualify a welder to perform the following additional operations:
 - (1) Welding of handrails in all positions.
 - (2) To make fillet welds of any size, in all positions, on base metals in all thicknesses for structural tubing.

~~12. To provide more definitive acceptance criteria for intermittent fillet welds for electrical raceway supports, Paragraph 4.6.1 of AWS A2.4 is replaced by the following:~~

~~When intermittent fillet welding is used by itself, the symbol indicates that increments shall be located at the ends of the dimensioned length. However, weld lengths starting or terminating within 1 inch of the end of the member shall be acceptable for electrical raceway supports.~~

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CATEGORY I STRUCTURES

- B. AISC, Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, as referenced in section 3.8.1.2.2, is used.
- C. AISC, Specification for Structural Joints Using ASTM A 325 or A 490 Bolts is used.

ATTACHMENT 2

LETTER FROM NRC
ACCEPTING NCIG POSITION

