TU ELECTRIC

William J. Cahill, Jr.
Executive Vice President

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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
REQUEST FOR ADDITIONAL INFORMATION
FRACTURE TOUGHNESS OF THE MAIN STEAM AND FEEDWATER SYSTEM MATERIALS

REF: TU Electric Letter from W. J. Cahill, Jr. to the U.S. NRC dated September 8, 1989 (TXX-89657)

Gentlemen:

Prior to submission of Amendement 77, the CPSES FSAR Section 10.3.6.1 stated that ferritic materials in the Containment Pressure Boundary are impact resistance tested. As previously discussed with NRC staff the Containment Pressure Boundary includes the Feedwater Isolation Valves (FWIV), and does not include the Feedwater Check Valves. Design specification, 2323-MS-20B.1, did not invoke impact testing requirements on the supplier of the Unit 1 or Unit 2 FWIV's. At the time that the Specification was issued ASME B&PV Code, Section III, Subsection NC-2300, stated that impact testing would be done if required by the design specifications. In lieu of impact testing, TU Electric has performed a fracture mechanics analysis and submitted an FSAR amendment (referenced above) on this subject. Subsequently, representatives from the NRC and TU Electric have had several discussions on the testing that should be performed on the FWIV's as a supplement to the fracture mechanics analysis.

The following describes the additional testing TU Electric proposes for these valves as well as reasons why volumetric testing should not be performed.

IMPACT TESTING UNIT 2 FWIV (2FW-0083)

The attached table shows the various heat numbers of the true primary components of the FWIV's (i.e., body, bonnet and neck). As can be noted, one Unit 2 FWIV (FW-0083) has the same heat numbers as 11 of the 12 components for the four Unit 1 FWIV's. All the components with the same heat number were issued under a single CMTR (no separate lot numbers).

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TU Electric will remove from the body, bonnet and neck of FWIV 2FW-0083 sufficient material to prepare three specimens from each component and perform Charpy V-Notch Impact Tests in accordance with ASME B&PV Code, Section II, Specification SA-370. The size of the material sample will be approximately 3"x3"x3/4" which is sufficient for the impact tests. Acceptable results in accordance with ASME B&PV Code, Section III, Subsection NC-2331, 1974 edition, winter 1974 addenda, will be used to supplement the fracture mechanics analysis.

The above will provide results representative of 11 out of the 12 major components on the Unit 1 FWIV's. The remaining component not being tested is the body of FWIV 1FW-0077.

PHYSICAL SAMPLE UNIT 1 FWIV (1FW-0077)

The body of FWIV 1FW-0077 will have a small physical sample removed and evaluated/tested by an experienced metallurgist to determine the following:

a. Microstructure to determine if the body has been properly heat treated as follows:

   Heat Treatment - Normalized
   Temperature (^{o}F) - 1650
   Time at Temperature - 25.5 Hours
   Cooling Rate - Air Cooled

b. Chemical properties to assure SA-105 material.

In addition to the above, TU Electric will perform surface hardness tests.

TU Electric will also perform the microstructure and chemical properties tests as described above for the valve body of the FWIV 2FW-0083. The data gathered for the body of 1FW-0077 will be compared to the same data obtained from 2FW-0083. If the results are similar, i.e., similar microstructure and chemical properties, then TU Electric can conclude that the acceptability of FWIV 1FW-0077 can be deduced from the impact tests on FWIV 2FW-0083. This conclusion would be drawn from a comparison of the available data and TU Electric would not perform an impact test on the Unit 1 valve body of FWIV 1FW-0077.

TESTS NOT BEING PERFORMED

Volumetric examinations of the valve body-to-neck and body-to-pipe welds have already been performed for Unit 1 and 2 FWIV's, and we will continue with the ISI program for these welds as previously committed. Additional volumetric examination of these FWIVs through radiographic or ultrasonic testing (RT/UT) will not be performed.

The basis for not performing these volumetric examinations is as follows:

Radiography:

- ASME B&PV Code provides no RT acceptance criteria for Class 2 forgings
- Radiographs will not provide meaningful flaw sizing results for any flaws detected, particularly considering the wall thickness involved (see attached Figure-1).

Ultrasonic:

- ASME B&PV Code, Section V, Article 23 (SA388) addresses UT examination of forgings but is oriented toward forgings prior to extensive final machining. In order to provide a geometric configuration conducive to ultrasonic examination, the code suggests that round forgings shall be machined to provide cylindrical surfaces for radial examination and the ends shall be machined perpendicular to the axis of the forging for the axial examination. Internal and external calibration notches would also be required if the forging is not solid.
- The FWIV forgings are in the final machined state (i.e., complex geometry) and numerous internal and external calibration notches would be required.
- The attached Figure shows a typical cross-section for the FWIVs and actual measured dimensions for the wall thickness of the valve body. The variations in wall thickness and non-parallel orientation of internal/external surfaces would render UT signal interpretation difficult or impossible making flaw sizing impractical at best.

TU Electric Level III examiners do not believe that either RT or UT examination of these FWIV's could provide results that would be meaningful to the resolution of this issue.

FINAL REPORT

TU Electric will prepare a final engineering report that includes the above testing results and the fracture mechanics analysis. TU Electric will provide the appropriate conclusions and recommendations based on this engineering report. The Unit 2 FWIVs will be evaluated at a later date.

TU Electric is proceeding on this basis and the final report on this subject will be available for review at the CPSES site by December 15, 1989.

Sincerely,

William J. Cahill, Jr.

By: John W. Beck
John W. Beck
Vice President,
Nuclear Engineering

MCP/smp
Attachments

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)

TABLE - 1

UNIT 1 VALVES
MATERIAL HEAT NUMBERS

	TAG#	RIR	VALVE S/N	BODY H/N	BONNET H/N	NECK H/N
BORG WARNER MS-20B.1 FORGED SA 105 ISOLATION VALVES	1FW-0071	6690	23993	1Q23	1R51	1P77
	1FW-0077	6843	23996	1Q83	1R51	1P77
	1FW-0083	6690	23994	1Q23	1R51	1P77
	1FW-0089	6690	23995	1Q23	1R51	1P77

UNIT 2 VALVES
MATERIAL HEAT NUMBERS

	TAG #	RIR	VALVE S/N	BODY H/N	BONNET H/N	NECK H/N
BORG WARNER MS-20B.1 FORGED SA 105 ISOLATION VALVES	2FW-0071	11807	51320	1Q23	1R51	2D8
	2FW-0077	13628	54156	1Q24	1R51	1P77
	2FW-0083	13628	54157	1Q23	1R51	1P77
	2FW-0089	13628	54158	1Q23	1R51	2D11

FIGURE - 1

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