

Attachment 2

Appendix

Texas Utilities Generating Company
Comanche Peak Steam Electric Station Unit 1
Docket No. 50-445

Safety Evaluation Report Supplement
Preservice Inspection Relief Request Evaluation

I. INTRODUCTION

This section was prepared with technical assistance of DOE contractors from the Pacific Northwest Laboratories.

For nuclear power facilities whose construction permit was issued on or after July 1, 1974, 10 CFR 50.55a(g)(3) specifies that components shall meet the preservice examination requirements set forth in Editions of Section XI of the ASME Boiler and Pressure Vessel Code and Addenda applied to the construction of the particular component. The provisions of 10 CFR 50.55a(g)(3) also state that components (including supports) may meet the requirements set forth in subsequent Editions and Addenda of this Code which are incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein.

In letters dated October 7, 1982, March 10, 1983, May 6, 1983, November 8, 1983, and August 29, 1984, the applicant requested relief from ASME Section XI Code requirements which the applicant has determined to be not practical. The relief requests were supported by information pursuant to 10 CFR 50.55a(a)(2)(i). Therefore, the staff evaluation consisted of reviewing the applicant's submittal to the requirements of the above referenced Code and determining if relief from the Code requirements were justified.

II. TECHNICAL REVIEW CONSIDERATIONS

A. The construction permit was issued on December 19, 1974. In accordance with 10 CFR 50.55a(g)(3), components (including

supports), which are classified as ASME Code Class 1 and 2, have been designed and provided with access to enable the performance of required preservice examinations set forth in the 1974 Edition of ASME Section XI, including the Addenda through Summer 1975. The applicant voluntarily updated the entire PSI Program to meet the 1980 Edition of ASME Section XI to the extent practical within the access provided for inspection and the limitations of component geometry.

- B. Verification of as-built structural integrity of the primary pressure boundary is not dependent on the Section XI preservice examination. The applicable construction codes to which the primary pressure boundary was fabricated contain examination and testing requirements which by themselves provide the necessary assurance that the pressure boundary components are capable of performing safely under all operating conditions reviewed in the FSAR and described in the plant design specification. As a part of these examinations, all of the primary pressure boundary full penetration welds were volumetrically examined (radiographed) and the system will be subjected to hydrostatic pressure tests.

- C. The intent of a preservice examination is to establish a reference or baseline prior to the initial operation of the facility. The results of subsequent inservice examination can then be compared with the original condition to determine if changes have occurred. If review of the inservice inspection results shows no change from the original condition, no action is required. In the case where baseline data are not available, all flaws must be treated as new flaws and evaluated accordingly. Section XI of the ASME Code contains acceptance standards which may be used as the basis for evaluating the acceptability of such flaws.

- D. Other benefits of the preservice examination include providing redundant or alternative volumetric examination of the primary pressure boundary using a test method different from that employed during the component fabrication. Successful performance of preservice examination also demonstrates that the welds so examined are capable of subsequent inservice examination using a similar test method.

In the case of Comanche Peak Unit 1, a large portion of the preservice examination required by the ASME Code was performed. Failure to perform a 100% preservice examination of the welds identified below will not significantly affect the assurance of the initial structural integrity.

- E. In some instances where the required preservice examinations were not performed to the full extent specified by the applicable ASME Code, the staff may require that these examinations or supplemental examinations be conducted as a part of the inservice inspection program. Requiring supplemental examinations to be performed at this time (before plant startup) would result in hardships or unusual difficulties without a compensating increase in the level of quality or safety. The performance of supplemental examinations, such as surface examinations, in areas where volumetric inspection is difficult will be more meaningful after a period of operation. Acceptable preoperational integrity has already been established by similar ASME Code, Section III fabrication examinations.

In cases where parts of the required examination areas cannot be effectively examined because of a combination of component design or current examination technique limitations, the development of new or improved examination techniques will continue to be evaluated. As improvements in these areas are achieved, the staff will require that these new techniques be made a part of the

inservice examination requirements for the components or welds which received a limited preservice examination.

Several of the preservice inspection relief requests involve limitations to the examination of the required volume of a specific weld. The inservice inspection (ISI) program is based on the examination of a representative sample of welds to detect generic degradation. In the event that the welds identified in the PSI relief requests are required to be examined again, the possibility of augmented inservice inspection will be evaluated during review of the applicant's initial 10-year ISI program. An augmented program may include increasing the extent and/or frequency of inspection of accessible welds.

III. EVALUATION OF RELIEF REQUESTS

The applicant requested relief from specific preservice inspection requirements in submittals dated October 7, 1982, March 10, 1983, May 6, 1983, November 8, 1983, and August 29, 1984. Based on the information submitted by the applicant and review by the staff of the design, geometry, and materials of construction of the components, certain preservice requirements of the ASME Boiler and Pressure Vessel Code, Section XI have been determined to be impractical and imposing these requirements would result in hardships or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(2), conclusions that these preservice requirements are impractical are justified as follows. Considering the large number of relief requests, the staff has grouped the issues by related technical subjects, which are (A) issues that do not require relief, (B) visual examinations, (C) recording of ultrasonic data, (D) removal of insulation to perform visual examinations, (E) limitations of required volumetric examination methods, and (F) limitations due to design, geometry and materials of construction.

Unless otherwise stated, references to Code refer to the ASME Code, Section XI, 1980 Edition.

A. Issues That The Staff Review Determined Do Not Require Relief: The applicability of approved Code cases, the updating of PSI program to use approved Editions of Section XI, the classification of components and the use of manufacturer's records.

1. CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENT:

Relief Request B-3. Pressurizer Seismic Support Lugs, ASME Code Class 1. The Code Examination Category B-H, Integral Attachments for Vessels, requires a volumetric or surface examination, as applicable and defined in Figures IWB-2500-13, -14, and -15. These figures describe integral supports that normally carry a structural load. This examination category does not apply to integral attachments that are not normally loaded, such as lifting lugs.

The applicant requests relief from performing a preservice volumetric or surface examination of the integral welded attachment based on the assumption that Examination Category B-H is applicable.

Relief Request B-6. Reactor Vessel Closure Head Studs, ASME Code Class 1. The Code requires a volumetric and surface examination of the closure studs, when removed, as defined in Figure IWB-2500-12 of Section XI.

The applicant requests relief from performing the entire volumetric examination because of the unique configuration of the stud.

Relief Request B-9. Reactor Vessel Bottom Head To Shell Weld, ASME Code Class 1. The Code requires a volumetric examination of essentially 100% of the pressure retaining welds.

The applicant requests relief to use the requirements of the 1974 Edition of Section XI including Addenda through Summer 1975.

Relief Request B-11. Reactor Vessel Inner and Outer Seal Monitoring Tube Penetration Weld, ASME Code Class 1. The Code Examination Categories B-E and B-P require a visual examination of the pressure retaining boundary during pre-service pressure tests.

The applicant requests relief to eliminate the visual examination during pressure tests.

Relief Request B-12. Pressurizer Shell Welds, ASME Code Class 1. The Code requires a volumetric examination of essentially 100% of the pressure retaining welds.

The applicant requests relief to use the requirements of the 1974 Edition of Section XI including Addenda through Summer 1975.

Relief Request B-15. Reactor Vessel Interior and Core Support Structure, ASME Code Class 1. Table IWB-2500-1, Item Numbers B 13.10 and b 30 requires a visual inspection of the accessible areas.

The applicant requests relief to use the Westinghouse Vibration Check-out Functional Test Inspection data package in lieu of a separate inspection.

Relief Request D-1. Systems in Support of the Reactor Shutdown Function and Engineered Safety Features, ASME Code Class 3. Table IWD-2500-1, Item Numbers D 1.10, D 2.10 and D 3.10 requires a visual examination of the pressure retaining components during system pressure tests.

The applicant requests relief to use the requirements of Subarticle IWD-2100 contained in the Winter 1981 Addenda of Section XI.

Relief Request D-2. Mechanical Snubbers, ASME Code Class 1, 2, 3 and balance of plant. Subarticle IWF-5200 of Section XI permits preservice tests to be conducted at the manufacturer's facilities. Sub-subarticle IWA-6210(b) requires that the Owner prepare records of the examinations, tests, replacements, and repairs.

The applicant requests relief to use the manufacturer's records.

2. BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATIONS:

Relief Request B-3. The lugs of the seismic supports that are welded to the pressurizer shell do not carry any load nor are they in contact with the building structure as defined in Figure B-3 of the applicant's submittal dated October 7, 1982. VT-3 examinations will be performed as required by Article IWF on the remaining portion of the seismic support as an alternative examination.

Relief Request B-6. The reactor vessel closure studs have a unique configuration as defined in Figure B-6 of the applicant's submittal dated October 7, 1982. The applicant's

basis for requesting relief is due to the inherent geometry of threaded fasteners and signal interference from threads, volumetric examinations do not provide meaningful results. Ultrasonic tests will not provide the needed information on axial running defects in nuts. These are the only defects that would reduce the component's ability to perform its intended function. The required surface examination will be performed. Volumetric examination will be performed to the maximum extent practical.

Relief Request B-9. The applicant voluntarily updated the PSI Program to meet the requirements of the 1980 Edition of Section XI. The reactor vessel bottom head to shell weld was examined to the requirements of the 1974 ASME Code Section XI up to and including the Summer 1975 Addenda prior to installation. The weld is now inaccessible for manual ultrasonic testing from the outside diameter (O.D.) surface. The reactor vessel was examined volumetrically from the inside diameter (I.D.) surface using remotely operated equipment. The existing data will be utilized to supplement the limited volumetric examination coverage at the internals' radial support lugs with the remote tool.

Relief Request B-11. The reactor closure head is sealed to the vessel by two O-ring seals. The vessel flange has two penetrations for closure head seal leakage monitoring. The inner monitoring tube detects leakage across the outer O-ring seal. Each of these tubes are connected by a partial penetration weld on the vessel flange gasket seal surface which is weld overlaid with 5/32 in. thick stainless steel. These welds are outside the pressure boundary for normal operation and will only be pressurized if the closure head seals leak. The monitoring tubes are 1-inch nominal pipe size. Table

IWB-2500-1 Category B-E and B-P (vessel penetrations) requires visual examination of these welds during hydrostatic testing. Sub-subarticle IWB-1220 exempts these components based on the size of the tubing, but again imposes a requirement for visual examination during hydrostatic pressure testing. Ultrasonic, surface, or visual examination of the welds cannot be performed due to the geometric configuration and inaccessibility due to weld overlap. Hydrostatic pressure testing of the welds is not feasible due to their location outside of the pressure retaining O-ring seal of the vessel flange. These welds will only be pressurized in the event of loss of integrity of the seals. Failure of both the O-ring seal and the tube welds is considered unlikely. No alternative examination is planned.

Relief Request B-12. The applicant voluntarily updated the PSI Program to meet the requirements of the 1980 Edition of Section XI. The pressurizer shell welds were examined to the requirements of the 1974 ASME Code Section XI up to and including the Summer 1975 Addenda. No reportable indications were noted at that time. Insulation support rings and insulation are now installed. Re-examination to the requirements of the 1980 Edition requires complete removal of all insulation and insulation support rings. Existing data will be utilized as the base-line preservice examination in lieu of re-inspection to 1980 Edition of Section XI.

Relief Request B-15. The applicant states that an extensive visual inspection which exceeds the requirements of Section XI was performed by Westinghouse as part of the Vibrational Check-out Functional Test Inspection. Therefore, the data from this inspection will be used in lieu of a separate inspection.

Relief Request D-1. Paragraph 10 CFR 50.55a(g) permits the updating to meet the requirements of later approved Code editions. Subarticle IWD-2100 contained in the Winter 1981 Addenda specifically deletes the preservice visual examination of Items D 1.10, D 2.10 and D 3.10. The requirements of Section XI are redundant to the ASME Section III hydrostatic test requirement.

Relief Request D-2.

- (1) A certified letter from the manufacturer of the mechanical snubbers serves the same purpose as having the test records on site.
- (2) Snubbers will be tested periodically inservice and the results of the "inservice test" only determines acceptability of the snubber.
- (3) Obtaining the manufacturer's records would cause an undue burden on the Owner due to the cost of obtaining these records.
- (4) The supplier is obligated by contract to maintain the records for all snubbers tested.

The records of the preservice tests conducted at the manufacturer's facilities will be a listing by serial number of all snubbers tested together with a certified letter from the manufacturer stating that the listed snubbers were tested and are acceptable in accordance with IWF-5200. This record will be maintained in accordance with IWA-6310.

3. STAFF EVALUATION

Relief Request B-3. The staff has determined that the pressurizer seismic support lugs are similar in classification to lifting lugs and are not subject to preservice examination under Examination Category B-H.

Relief Request B-6. On May 15, 1978, the ASME Council approved Code Case N-216 entitled "Alternative Rules for Reactor Vessel Closure Stud Examination," which addresses the examination methods that may be used for reactor vessel closure studs that do not have an end surface sufficiently large to permit meaningful ultrasonic examination. Code Case N-216 provides the following alternative requirements to those of Table IWB-2600-1 and Fig. IWB-2500-12:

"For reactor vessel studs, upon which an ultrasonic examination from the end surfaces is not possible, surface examination only may be used, except that the examinations may not be deferred until the end of the inspection interval."

In Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability," Code Case N-216 has been determined to be acceptable to the staff without limitations. The reactor vessel closure studs installed at Comanche Peak have a unique configuration and have similar features to the stud design considered by the ASME Council. An integrally machined tensioning structure at the top of the stud and a conical-shaped center hole limits the ultrasonic examination from the end surface. The applicant's figure B-6 shows a cylindrical center hole in the active thread region of the stud. The staff has determined that Code Case N-216 is applicable to the preservice examination of the Comanche Peak reactor vessel studs and the preservice examinations meet the

stipulations of this Code Case. However, if the applicant elects to apply Code Case N-216 for the inservice inspection of the reactor vessel closure studs, the volumetric examinations required by items B 6.20 closure studs, in place, and B 6.30 closure studs, when removed, should include an ultrasonic examination of the active thread region from the cylindrical center hole.

Relief Requests B-3, B-6, B-9, B-11, B-12, B-15, D-1, and D-2. The staff has reviewed the applicant's submittals related to these relief requests. The ASME Code requirements, the applicant's actions regarding these issues and the applicant's basis for requesting relief have been described. The staff has concluded that the applicant has either met (1) the requirements of an approved Code Case, (2) the specific requirements of the regulation, or (3) the provisions of the applicable editions of Section XI of the Code. Therefore, relief from the preservice requirements of the Code for these subjects is not necessary.

B. Subjects: Visual Examinations. The Use of Manufacturer's Examination, Quality Assurance Installation Verification, Preoperational Test Inspections and System Functionability Verification.

1. CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENT:

Relief Request B-1. Valve Bodies Exceeding 4-inch Nominal Pipe Size and Pump Casings, ASME Code Class 1. The Code requires a visual examination (VT-3) of the component internal surfaces. The applicant requests relief to use manufacturer's examination in lieu of field examinations.

Relief Request D-3. Integral Attachments for Systems in Support of the Reactor Shutdown Function and Engineered Safety Features, ASME Code Class 3. The Code requires a visual examination (VT-3) of the component supports. The applicant requests relief to use manufacturer's examination and other field inspections and tests in lieu of separate field examinations.

2. BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATIONS:

Relief Request B-1. The casings and bodies were visually inspected as part of the manufacturing process, but the inspections were not documented in accordance with Section XI requirements. Liquid penetrant examination was also performed on the components. Disassembly of pumps and valves at this time would not be practical. Manufacturer records will be used in the as recorded condition and the records will be maintained at the manufacturers' facility.

Relief Request D-3. This relief request addresses integral attachments in Table IWD-2500-1, Items D1.20 thru D1.60, Items D2.20 thru D2.60, and Items D3.20 thru D3.60.

Various pre-startup tests and inspections performed on integral attachments to a great extent duplicate the visual inspection requirement of the preservice inspection. Documentation provided for Manufacturers' inspection, Quality Assurance installation verification, preoperational test inspections and system functionality verification will be used in lieu of the IWD VT-3 visual inspection requirements.

3. STAFF EVALUATION: The Code states that the "VT-3 visual examination shall be conducted to determine the general mechanical and structural conditions of components and their supports, such as the presence of loose parts, debris, or abnormal corrosion products, wear, erosion, corrosion, and the loss of integrity at bolted or welded connections.... For component supports and component interiors, the visual examination may be performed remotely with or without optical aids to verify the structural integrity of the component."

In Relief Request B-1, the staff concludes that disassembly of these valves and pumps at this time solely to perform the required Section XI preservice visual examination of the internal surface is impractical. In Relief Requests B-1 and D-3, the staff has also determined that the nondestructive examinations, installation verification, preoperational tests and functional verification performed to date or to be performed significantly exceed the requirements of the Section XI visual examination and, therefore, these examinations and tests are an acceptable alternative to the Code inspection requirement. (The staff evaluation of Relief Requests D-1 and F-1 also addresses these subjects.)

C. SUBJECT: Recording Straight Beam and Angle Beam Ultrasonic Data from Planar Reflectors.

1. CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENT:

Relief Request B-13. ASME Code Class 1 and 2 Components and Piping. Section XI of the ASME Code requires that during ultrasonic examinations reflectors that produce a

response greater than 50% of the reference level shall be recorded. The applicant requests relief to only record data from ultrasonic indications interpreted to be flaws.

2. BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATIONS:

It is recognized throughout the NDE industry and by the following applicable code; Section V Article 4, Paragraph T-451.1, that all ultrasonic reflectors are not valid flaw indications. Reflectors determined to be weld root geometry, weld to base metal interface, or any type of geometry, can not be classified as a valid flaw and should not be compared with the allowable indication standards. Geometric indications will not be considered recordable. No alternative method of recording is proposed.

3. STAFF EVALUATION: Subarticle IWA-1400 of Section XI defines the responsibility of the Owner of nuclear power plants to include the following:

"(h) recording of examination and test results that provide a basis for evaluation and facilitate comparison with the results of subsequent examinations;

(i) evaluation of examination and test results."

In Supplement No. 4 of NUREG-0794, the staff concluded that the preservice inspection of the reactor vessel included provisions for meeting Regulatory Guide 1.150, which addresses appropriate augmented recording practices for the reactor vessel. In response to FSAR Question 121.11 (August 7, 1981), the applicant states the following:

"During the preservice examination of piping system welds (a) any indication, 20 percent DAC or greater, discovered during UT examination of piping welds and base metal materials will be investigated by a Level II or Level III examiner to the extent necessary to determine the probable cause, identity, and source of the reflector, and (b) CPSES engineering or an authorized representative will evaluate and take corrective action for the disposition of all characterized indications which are determined to be other than geometric or metallurgical in nature."

The applicant is correct in his conclusion that all ultrasonic reflectors do not originate from cracks or flaws. The staff, the Code and the NDE industry recognize that one of the major problem areas in ultrasonic testing is differentiating between innocuous reflectors such as geometric and metallurgical reflectors, and flaws due to service-induced degradation. Therefore, the Code has included conservative recording criteria to provide a basis for evaluation and facilitate comparison with the results of subsequent examinations. The fabrication radiography is designed to ensure the initial structure integrity by detecting fabrication defects and by identifying conditions such as excessive weld root geometry and counterbore.

Although the applicant has made a decision based primarily on a specific commercial reason not to record geometric indications, the staff has concluded that this relief request is acceptable for the preservice inspection because the applicant has determined that the reflectors are geometric in origin and not flaws. Therefore, the recording of geometric reflectors or not during PSI has no real impact on the original plant integrity because the full penetration

welds in the reactor coolant pressure boundary were also radiographed and found to be acceptable during construction. However, the Code requirements for recording the ultrasonic indications from both service-induced degradation and innocuous reflectors above the recording threshold referenced in 10 CFR 50.55a(g)(4) must be followed during inservice examinations to assure accurate documentation of these indications for comparison with the results of subsequent examinations.

D. SUBJECT: Removal of Insulation to Perform Visual Examinations.

1. CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENT:

Relief Request F-1. ASME Code Class 1, 2 and 3 Component Supports. Section XI of the Code requires that all visual examinations defined in Table IWF-2500-2 shall be performed once following the initiation of hot functional tests. The applicant requests relief to perform the required visual examinations without the removal of insulation.

2. BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATION:

Installation verification inspections to a great extent duplicate the inspection requirements of IWF. Performance of inspection after initiation of hot functional testing requires the removal and re-installation of large amounts of insulation which causes significant cost and schedule

impacts. Documentation provided for Quality Assurance installation verification, preoperational test inspections and system functionality verification will be used in lieu of IWF component support inspections.

3. STAFF EVALUATION: Article IWF of Section XI provides requirements for the inspection of ASME Code Class 1, 2 and 3 and MC component supports required to be constructed in accordance with Subsection NF of ASME Section III. The component supports addressed by this relief request are not the integral attachment to the pressure retaining component. The examination method for all component supports, covered by Article IWF, is visual inspections conducted to determine the general mechanical and structural condition of the support, the operability of the component or device, confirmation of functional adequacy, verification of the settings or freedom of motion.

Considering the scope of Article IWF some of the required preservice inspections, such as verification of pipe hanger settings or freedom of motion, must be performed after hot functional testing or initial criticality. The applicant proposes to use documentation provided for Quality Assurance installation verification, preoperational test inspections and system functionality verification as an alternative program in lieu of IWF component support preservice inspections. The staff has concluded that the alternative program proposed by the application is acceptable provided that the applicant meets the following conditions:

- (1) All visual inspections required by Table IWF-2500-2 are actually conducted before full power operation although removal of insulation will not be required by the staff,
- (2) All visual inspections that require system function or minimum operating conditions are performed after these conditions are achieved, and
- (3) The records and reports of the alternative program are documented in a manner consistent with Article IWA-6000.

The basis for the staff's conclusion is the alternative program, including the conditions described above, will exceed the requirements of the Section XI visual examinations. The staff has reviewed the associated subject of removal and reinstallation of large amounts of insulation to perform required visual examinations. Some of the required examinations are covered by subarticle IWF-1300(e) which states:

"Where the mechanical connection of a non-integral support is buried within the component insulation, the support boundary may extend from the surface of the component insulation provided the support either carries the weight of the component or serves as a structural restraint in compression."

The staff has concluded that the general removal and reinstallation of large amounts of insulation to perform the specific visual examinations is impractical. The staff has determined that the alternative program, including the stipulated conditions, will include documented surveys of insulated components after low power operation and these measures will be equivalent to the Code required visual examinations.

E. SUBJECT: Limitations of Required Volumetric Examination Methods

1. CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENT.

Relief Request C-2. Reactor Coolant Filter, Seal Water Return Filter, Seal Water Heat Exchanger, and Letdown Reheat Heat Exchanger, ASME Code Class 2. The Code requires a volumetric examination of the pressure retaining welds in pressure vessels. The applicant requests relief to eliminate the volumetric examination requirement.

2. BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATIONS.

The thickness of the material utilized for the construction of these components (0.187 inches) is such that meaningful results can not be expected with ultrasonic examination. These welds will be examined using surface and visual techniques as alternative examinations.

3. STAFF EVALUATION: The staff does not agree with the applicant's conclusion that ultrasonic examination of materials 0.187 inches can not be performed. However, the staff has determined that fabrication ultrasonic calibration standards and performing an inspection for comparison with the Section XI Table IWB-3511-1 acceptance standards is impractical.

The staff has concluded that the applicant has proposed an acceptable alternative program of surface and visual examinations that is as capable of detecting significant defects in 0.187 inch material as the Code required volumetric examination.

F. SUBJECT: Limitations to Examination Due to Design, Geometry and Materials of Construction.

1.A CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENTS:

Relief Requests B-2, B-8, B-10, and C-5. ASME Code Class 1 and 2 Piping System Welds. The Code requires a volumetric and surface examination of the subject welds. The applicant requests relief from performing 100% of the volumetric examination.

2.A BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATION:

Relief Requests B-2, B-8, B-10, and C-5. In the submittals dated October 7, 1982 and August 29, 1984, the applicant identified specific piping system welds and safe end to pipe welds that had limitations to ultrasonic examinations, and described the physical configuration and the reasons that 100% of the preservice volumetric examination could not be completed. The ultrasonic examinations were performed to the extent practical and the applicant estimated the percentage of the examination completed for the majority of welds. (Some of the welds were examined based on the 1974 Edition of Section XI before the Preservice Inspection Program was updated, and the percentage of examinations was not recorded.) Radiography was performed during construction and a surface examination was performed during construction or the pre-service examination.

The number of welds involved in each relief request are as follows:

Relief Request B-2: One weld
Relief Request B-8: Eleven welds
Relief Request B-10: Seventy-two welds
Relief Request C-5: Eighteen welds

3.A STAFF EVALUATION: The staff has determined that the volumetric examination of the subject welds to the extent required by the Code is impractical because of the design of the piping system. The applicant has performed limited Section XI ultrasonic inspections. Radiography was performed on all of the welds during construction and at least one surface examination was performed during construction or the preservice examination. The staff concludes that the limited Section XI ultrasonic examinations, the surface examinations, the volumetric examination during fabrication and the system hydrostatic test demonstrate an acceptable level of preservice structural integrity.

1.B CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENT:

Relief Request B-5. Reactor Vessel Nozzle to Safe End Welds, ASME Code Class 1. The Code requires a volumetric and surface examination of the subject welds. The applicant requests relief from performing 100% of the surface examination.

2.B BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATION:

The design of the permanent insulation around the nozzle prevents surface examinations being performed on the base metal on the nozzle side of the weld to the extent required by IWB-2500-1 Category B-J and Figure IWB-2500-8. The nozzle

configuration is shown in Figure B-5 of the applicant's submittal dated October 7, 1982. The weld, base metal on the pipe side, and base metal on the nozzle side to the extent practical will be examined by ultrasonic and surface techniques from the outside surface. As an alternative examination, the weld and required amount of base metal on each side of the weld will be ultrasonically examined from inside the nozzle utilizing remotely operated tooling.

3.B STAFF EVALUATION: The staff has reviewed the design configuration of the nozzle to safe end welds and the physical obstruction caused by the permanent insulation. The staff has determined that the combination of outside and inside ultrasonic examination of the weld meets the volumetric requirement of the Code. The staff has concluded that the limited surface examination on the nozzle side of the weld and inside ultrasonic examination are equivalent or superior to the Code required surface examination. Therefore, the staff finds that the applicant has proposed an acceptable alternative to the Code requirement.

1.C CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENTS:

Relief Requests B-7, B-14, and C-4. Nozzle To Shell Welds or Nozzle Inner Radius Regions of ASME Code Class 1 and 2 Vessels. The Code requires a volumetric examination of the weld or specific regions of the base metal. The applicant requests relief from performing 100% of the volumetric examination.

2.C BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATION:

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Relief Request A-7. In the pressurizer, the geometric configuration of the nozzle prevents ultrasonic examinations from being performed from the nozzle side of the weld to the extent required by Figure IWB-2500-7. Examinations will be performed from both the weld and shell surfaces. The nozzle configuration is shown in Figure B-7 of the applicant's submittal dated October 7, 1982. One hundred percent of the weld, the heat affected zone and the required amount of base metal on the shell side of the weld will be examined. Base metal on the nozzle side of the weld will be examined to the extent practical.

Relief Request B-14. In the Steam Generator (Reactor Coolant Nozzles) and the Pressurizer (Spray, Safety, Relief and Surge Nozzle), the configuration of the nozzle to vessel at the inner radius section prevents meaningful volumetric examination. Practical alternative techniques to volumetrically examining the inner radius section which would produce meaningful results are not presently available.

A visual examination of the inner radius section will be performed only if the Steam Generators and Pressurizer are opened for other types of examinations or for maintenance purposes. The surge nozzle inner radius section is not accessible due to the heaters connected inside the bottom head.

Relief Request C-4. In the Steam Generator, the 32" Main Steam Nozzle and the 18" Feedwater Nozzle, the configuration of the nozzle to vessel at the inner radius section prevents meaningful volumetric examination. Practical alternative techniques to volumetrically examining these areas which would produce meaningful results are not presently available.

A visual examination of the inner radius section will be performed only if the steam generators are opened for other types of examinations or for maintenance purposes.

3.C STAFF EVALUATION:

Relief Request B-7. The staff has determined that the volumetric examination of the subject nozzle welds to the extent required by the Code is impractical because of the design configuration of the nozzle. The staff has concluded that the limited Section XI ultrasonic examination, the radiography performed during fabrication and the system hydrostatic test demonstrate an acceptable level of preservice structural integrity.

Relief Requests B-14 and C-4. The staff has determined that examination of the inner radius to the extent required by Code is impractical. The physical configuration of the nozzle does not allow ultrasound energy to be directed to and received from the area of interest in the inner radius. A visual examination of the inner radius will be performed if the steam generators or pressurizer are opened for other types of examination or

for maintenance purposes. The staff has concluded that the hydrostatic test demonstrates an acceptable level of preservice structural integrity of the nozzle inner radius region.

1.D CODE RELIEF REQUEST and NUMBER, COMPONENT and CODE REQUIREMENT:

Relief Request B-4. Steam Generator Channel Head to Tubesheet Weld. The Code requires a volumetric examination of the full length of the weld. The applicant requests relief from performing 100% of the volumetric examination.

2.D BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATION:

Relief Request B-4. Support feet extending down from the tubesheet forging to the main support columns are not removable and obstruct portions of the weld at four locations around the vessel as shown in Figure B-4 of the applicant's submittal dated October 7, 1982. The location of the support feet obstructions will be documented as limitations on the ultrasonic examination report form and the extent of examinations recorded.

3.D STAFF EVALUATION: The staff has reviewed the physical configuration of the obstruction and determined that the preservice examination of the entire channel head to tubesheet weld has been impractical since installation of the support feet in the fabrication shop. The staff has concluded that the limited Section XI ultrasonic examination, the radiography performed during fabrication and the system hydrostatic test demonstrate an acceptable level of preservice structural integrity.

1.E CODE RELIEF REQUEST and NUMBER, COMPONENT and CODE REQUIREMENT.

Relief Requests C-1 and C-6. Circumferential Shell and Head Welds in the Letdown Heat Exchanger, Excess Letdown Heat Exchanger, Regenerative Heat Exchanger, and Vertical Residual Heat Exchangers, ASME Code Class 2. The Code requires a volumetric examination of a sample of welds. The applicant requests relief from performing 100% of the volumetric examination.

2.E BASIS FOR RELIEF REQUEST AND ALTERNATIVE EXAMINATION:

Relief Requests C-1 and C-6. In the submittals dated October 7, 1982 and August 29, 1984, the applicant identified the vessel welds that had limitations to ultrasonic examination, described the physical configuration and the reasons that 100% of the preservice volumetric examination could not be completed. The ultrasonic examinations were performed to the extent practical and the applicant estimated the percentage of the examination completed for the majority of welds. The heat exchanger shell welds were radiographed during fabrication.

3.E STAFF EVALUATION: The Section XI preservice volumetric examination of pressure retaining welds in ASME Class 2 pressure vessels is based on a sampling of selected welds. Only welds at gross structural discontinuities are required to be examined for shell circumferential welds. In the case of multiple vessels of similar design, size and service the required examinations may be limited to one vessel or distributed among the vessels.

The staff has reviewed the information provided by the applicant and determined that the volumetric examination of the subject welds to the extent required by the Code is impractical because of the design configuration of the vessels. The applicant has performed limited Section XI ultrasonic inspections to the extent practical. The staff concludes that the limited Section XI ultrasonic examinations, the radiography performed during fabrication, and the system hydrostatic test demonstrate an acceptable level of preservice structural integrity.

1.F CODE RELIEF REQUEST and NUMBER, COMPONENTS and CODE REQUIREMENT:

Relief Request C-3. Main Steam Line Pipe Supports, ASME Code Class 2. The Code requires a surface examination of integrally welded attachments whose base material thickness is 3/4 inch or greater. The applicant requests relief to eliminate the required surface examination.

2.F BASIS FOR RELIEF REQUEST and ALTERNATIVE EXAMINATION: The integrally welded attachments shown in the attached Figure C-3 of the applicant's submittal dated October 7, 1982 are used as shims for the U-Bolt rather than as a supporting element for the pipe. These shims are fillet welded in two places (top and bottom) to maintain the position of the shim. As an alternative examination, VT-3 visual examination will be performed as required by Subsection IWF.

3.F STAFF EVALUATION: The staff has reviewed the configuration of the welded support shims and determined that the fillet welds are attachments to the pressure boundary and subject to preservice examination. The staff has concluded that a

VT-3 visual examination is an acceptable alternative to the Code required surface examination because the fillet welds are only intended to maintain the position of the shim.

IV. CONCLUSIONS

Based on the foregoing, pursuant to 10 CFR 50.55a(a)(2), certain Section XI required preservice examinations are impractical, and compliance with the requirements would result in hardships or unusual difficulties without a compensating increase in the level of quality and safety.

The staff technical evaluation has not identified any practical method by which the existing Comanche Peak Steam Electric Station Unit 1 can meet all the specific preservice inspection requirements of Section XI of the ASME Code. Requiring compliance with all the exact Section XI required inspections would delay the startup of the plant in order to redesign a significant number of plant systems, obtain sufficient replacement components, install the new components, and repeat the preservice examination of these components. Examples of components that would require redesign to meet the specific preservice examination provisions are the reactor vessel and a number of the piping and component support systems. Even after the redesign effort, complete compliance with the preservice examination requirements probably could not be achieved. However, the as-built structural integrity of the existing primary pressure boundary has already been established by the construction code fabrication examinations.

Based on the review and evaluation of the cited information, the staff concludes that the public interest is not served by imposing certain provisions of Section XI of the ASME Code that have been determined

to be impractical. Pursuant to 10 CFR 50.55a(a)(2), relief is allowed from these requirements which are impractical to implement and would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.