



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

November 1, 2012
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File No.: G25
10 CFR 50.55a

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Request for Relief from ASME Section XI Code Requirements for
Reactor Pressure Vessel Head Flange O-Ring Leakoff Lines Non-Destructive Examination
(Relief Request RR-ENG-3-10)

In accordance with the provisions of 10 CFR 50.55a(a)(3)(ii), the STP Nuclear Operating Company (STPNOC) requests relief for South Texas Project (STP) Units 1 and 2, for the third inspection interval, from the ASME Section XI code non-destructive examination pressure requirement for the system leakage test applicable to the reactor pressure vessel (RPV) head flange O-ring leakoff lines. STPNOC has determined that compliance with code inspection requirements is impractical and would result in unnecessary hardship without a compensating increase in the level of quality and safety. As an alternative to a system leakage test at system operating pressure, STPNOC proposes to examine the accessible portions of the system using the VT-2 visual examination method, conducted at ambient conditions after the refueling cavity has been filled to its normal refueling water level for at least four hours, as described in the attached relief request.

STPNOC requests NRC review and approval of this relief request by November 6, 2012, to support use of the proposed alternative when authorized, as required by 10 CFR 50.55a(a)(3), during the current refueling outage for STP Unit 1 while plant conditions are appropriate for the proposed alternative examination, in order to meet the examination requirements for STP Unit 1 that cover the first period of the third inspection interval ending in September 2013.

There are no commitments in this letter.

If there are any questions, please contact Marco Ruvalcaba at 361-972-7904, or me at 361-972-7867.

D. W. Rencurrel
Senior Vice President

ccc

Attachment: Request for Relief from ASME Section XI Code Requirements for Reactor Pressure Vessel Head Flange O-Ring Leakoff Lines Non-Destructive Examination (Relief Request RR-ENG-3-10)

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STI: 33617053

cc: (paper copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
612 East Lamar Boulevard
Arlington, TX 76011-4511

Balwant K. Singal
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 8 B1)
11555 Rockville Pike
Rockville, MD 20852

NRC Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

Carl F. Lyon
Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 8 B1A)
11555 Rockville Pike
Rockville, MD 20852

(electronic copy)

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

Balwant K. Singal
Carl F. Lyon
U. S. Nuclear Regulatory Commission

John Ragan
Chris O-Hara
Jim von Suskil
NRG South Texas LP

Kevin Pollo
Richard Pena
City Public Service

Peter Nemeth
Crain Caton & James, P.C.

C. Mele
City of Austin

Richard A. Ratliff
Texas Department of State Health Services

Alice Rogers
Texas Department of State Health Services

SOUTH TEXAS PROJECT
UNITS 1 AND 2
REQUEST FOR RELIEF FROM ASME SECTION XI CODE REQUIREMENTS FOR
REACTOR PRESSURE VESSEL HEAD FLANGE O-RING LEAKOFF LINES
NON-DESTRUCTIVE EXAMINATION
(RELIEF REQUEST RR-ENG-3-10)

A. Components Affected

(a) Component: Reactor Pressure Vessel (RPV)

(b) Description: RPV Head Flange O-Ring Leakoff Lines

The leakoff lines material specification is Alloy 600 and stainless steel. Piping is ¾-inch ASME Class 2, schedule 160S, design pressure 2485 psig; Material specification BB2, SA-312 Grade 304 or 316. Monitor tubes supplied by vessel OEM are 1-inch Class 2 schedule 160S, SA-312 Grade 316 and 1.5-inch Class 2 Alloy 600 SB-166.

(c) Class: ASME Code Class 2

B. Applicable Code Requirement

The applicable code is ASME Section XI, 2004 Edition (no addenda).

IWC-5220 requires that the system leakage test shall be conducted at the system pressure obtained while the system, or portion of the system, is in service performing its normal operating function or at the system pressure developed during a test conducted to verify system operability (e.g., to demonstrate system safety function or satisfy technical specification surveillance requirements).

Examination of the RPV head flange O-ring leakoff lines is required each Inspection Period.

C. Basis for Relief from Code Requirements

In accordance with the provisions of 10 CFR 50.55a(a)(3)(ii), STPNOC requests relief from the Section XI code requirement for system leakage tests of the RPV head flange O-ring leakoff lines on the basis that compliance with the code specified pressure requirement to test the leakoff lines at system operating pressure is impractical and would result in unusual difficulty without a compensating increase in the level of quality and safety.

The RPV head flange O-ring leakoff lines are separated from the reactor coolant system operating pressure by an inner O-ring and an outer O-ring (see Figures 1 and 2 below). With the RPV head flange O-rings installed and performing their intended function, the leakoff lines are not expected to be pressurized during the system pressure test following a refueling outage.

With the RPV head removed, the configuration of the leakoff piping would require the lines to be plugged at the RPV flange to establish a boundary for a leakage test at system operating

pressure. Performance of such a test would require installation and removal of the plugs that would result in significant radiation exposure, estimated at 1000-2000 mrem per test. Applying system pressure to the leakoff lines is also not practical with the RPV head installed, since it would require either intentionally failing the O-rings or pressurization in the direction opposite to the intended design function of the O-rings that could damage O-ring material. Purposely failing the O-rings to perform the code required pressure test would require purchase of a new set of O-rings, and additional time and radiation exposure to remove the RPV head, install new O-rings, and reinstall the head. This is considered to impose an undue hardship and burden.

D. Alternative Examination:

In accordance with the provisions of 10 CFR 50.55a(a)(3)(ii), STPNOC proposes to examine the Class 2 portions of the leak detection system, consisting of the accessible portions of the RPV head flange O-ring leakoff lines (refer to Figures 1 and 2). The leakoff lines shall be examined using the VT-2 visual examination method. The test shall be conducted at ambient conditions after the refueling cavity has been filled to its normal refueling water level for at least four (4) hours, when the piping is subjected to the static pressure head when the reactor cavity is filled.

E. Justification for Granting Relief

STP tests the RPV flange O-ring leakoff lines every outage at normal operating temperature and pressure with the RPV flange O-rings installed. ASME Section XI Committee has acknowledged that these lines may not be subjected to system pressure in this mode and has issued Code Case N-805 for alternate testing. The proposed alternative examination method was developed using the guidance provided in N-805.

As described in the Updated Final Safety Analysis Report (UFSAR) section 5.2.5.1.3, leakage from the RPV flange is collected in the reactor coolant system drain tank (RCDT) and is identified by an increase in temperature that is monitored in the flange leakoff line. The UFSAR section 5.3.3.1 description of reactor vessel design states: "The reactor vessel flange and head are sealed by two hollow metallic O-rings. Seal leakage is detected by means of two leakoff connections: one between the inner and outer ring and one outside the outer O-ring. For Unit 1, a 1/8 in. threaded plug made of stainless steel has been installed and seal welded in the reactor vessel flange drain hole for the inner O-ring leakoff line."

The flange seal leakoff lines are essentially a leakage collection/detection system and would only function as a Class 2 pressure boundary in the event of failure of the O-rings separating the lines from reactor coolant system operating pressure. Any significant leakage in this condition would be expected to clearly exhibit boric acid accumulation that would be discernible during the proposed alternate VT-2 visual examination that will be performed. The static head developed with the leak detection line filled with water will allow for the detection of any gross indications in the line.

F. Implementation Schedule

STPNOC requests NRC review and approval of this relief request by November 6, 2012, to support use of the proposed alternative when authorized, as required by 10 CFR

50.55a(a)(3), during the current refueling outage for STP Unit 1 while plant conditions are appropriate for the proposed alternative examination. Since the examination requirements cover the first period of the third inspection interval ending in September 24, 2013, the current plant conditions in STP Unit 1 provide the last practical opportunity to meet the required examination frequency of once per inspection period.

Relief is requested for the duration of the third ten-year inservice inspection interval for STP Units 1 and 2. The third interval began September 25, 2010 (Unit 1) and October 19, 2010 (Unit 2), and ends September 24, 2020 and October 18, 2020, respectively.

G. Precedents

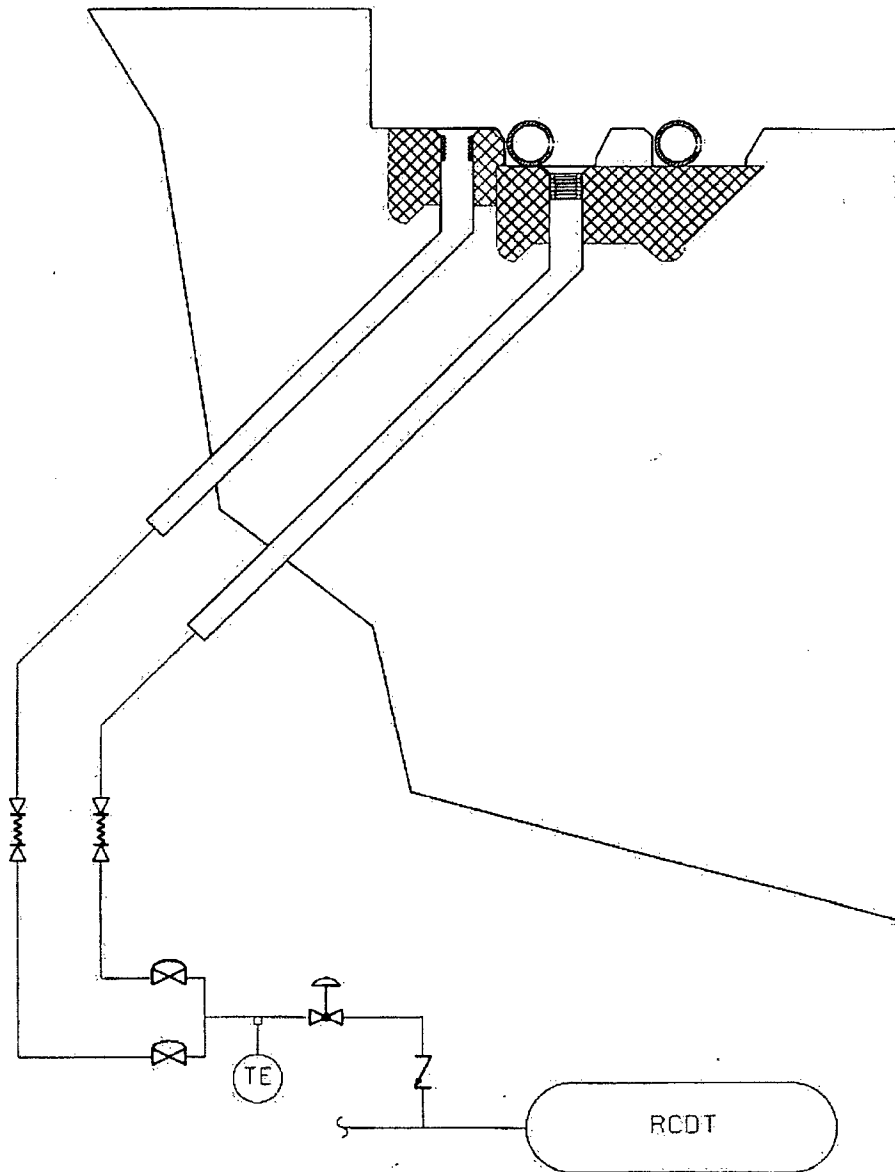
Similar relief requests have been previously approved by the NRC for the following (with ADAMS Accession No. references):

- (1) Comanche Peak Nuclear Power Plant, Second Inspection Interval Relief Request C-9, "Alternative Pressure Testing Requirements for the Reactor Pressure Vessel Flange Leak-off Piping", as approved by NRC letter dated December 19, 2011 (ML113110092).
- (2) LaSalle County Station, Third Inspection Interval Relief Request 13R-08, "Request for Relief for Inservice Inspection Impracticality of Pressure Testing the RPV Head Flange Seal Leak Detection System," as approved by NRC letter dated January 30, 2008 (ML073610587).
- (3) Susquehanna Steam Electric Station, Third 10-Year Inservice Inspection (ISI) Interval Program Plan Request for Relief 3RR-07, "Exemption from Pressure Testing Reactor Pressure Vessel Head Flange Seal Leak Detection System," as approved by NRC letter dated September 24, 2004 (ML042680078).

Note: The following precedents were for similar lines designated Class 1:

- (4) Millstone Power Station Unit 3, Relief Request IR-3-11, "Alternative Pressure Testing Requirements for the RPV Flange Leak-Off Piping," approved by NRC letter dated April 29, 2010 (ML101040042).
- (5) North Anna, Relief Request SPT-013, "Examination Category B-P Pressure Retaining Components in the Reactor Coolant System," approved by NRC letter dated February 9, 2006 (ML060450517).
- (6) Limerick, Second Interval Relief Request RR-33, "Relief for Pressure Testing the RPV Head Flange Seal Leak Detection System," as approved by NRC letter dated January 27, 2009 (ML090060218).

Figure 1. STP Unit 1 RPV Head Flange O-Ring Leakoff Lines



Note the plug installed in Unit 1 inner O-ring leakoff line during 1RE14 in April 2008 (reference DCP 08-6364-5 Supplement 1).

Figure 2. STP Unit 2 RPV Head Flange O-Ring Leakoff Lines

