

October 25, 2007

Ms. Marilyn Kray  
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SUBJECT: FINAL SAFETY EVALUATION FOR AP1000 TECHNICAL REPORT NUMBER  
AP-TR-NS01, CONTAINMENT LEAK RATE TEST PROGRAM  
(TAC NO. MD5136)

Dear Ms. Kray:

On April 4, 2007, NuStart Energy, LLC (NuStart) submitted Rev. 1 of AP1000 Standard Combined License Technical Report (TR) Number AP-TR-NS01, Containment Leak Rate Test Program. The purpose of this TR is to complete the description of the Containment Leak Rate Test (CLRT) Program for those AP1000 Combined Construction and Operating License (COL) applicants who choose to implement the methodology described in this report and close COL Information Item 6.2-1. Appendix A to this TR describes a CLRT Program that implements Option B (for performance-based requirements) of 10 CFR Part 50, Appendix J.

The staff has found that AP-TR-NS01, Revision 1 is acceptable for referencing in licensing applications for AP1000 to the extent specified and under the limitations delineated in the TR and in the enclosed Safety Evaluation (SE). The SE defines the basis for acceptance of the TR.

Our acceptance applies only to material provided in the subject TR. We do not intend to repeat our review of the acceptable material described in the TR. When the TR appears as a reference in regulatory applications, our review will ensure that the material presented applies to the specific application involved. Regulatory applications that deviate from this TR will be subject to further review in accordance with applicable review standards.

In accordance with the guidance provided on the Nuclear Regulatory Commission (NRC) website, we request that NuStart publish the accepted version of this TR within three months of receipt of this letter. The accepted version shall incorporate this letter and the enclosed SE after the title page. Also, the accepted version must contain historical review information. The accepted version shall include a "-A" (designating accepted) following the TR identification symbol.

If future changes to the NRC's regulatory requirements affect the acceptability of this TR, NuStart will be expected to revise the TR appropriately, or justify its continued applicability for subsequent referencing.

M. Kray

- 2 -

If you have any questions, please contact me at [smc1@nrc.gov](mailto:smc1@nrc.gov) or (301) 415-2757.

Sincerely,

**/RA/**

Stephanie Coffin, Branch Chief  
AP1000 Projects Branch 1  
Division of New Reactor Licensing  
Office of New Reactors

Project No.: 740

Enclosure:  
Final Safety Evaluation

M. Kray

- 2 -

If you have any questions, please contact me at [smc1@nrc.gov](mailto:smc1@nrc.gov) or (301) 415-2757.

Sincerely,

**/RA/**

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Enclosure:  
Final Safety Evaluation

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FINAL SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

TOPICAL REPORT NUMBER AP-TR-NS01, REVISION 1

CONTAINMENT LEAK RATE TEST PROGRAM (TAC NO. MD5136)

PROJECT NO. 740

## 1.0 Introduction

In a letter dated April 4, 2007, NuStart Energy, LLC (NuStart) submitted Rev. 1 of AP1000 Standard Combined License Technical Report (TR) Number AP-TR-NS01, Containment Leak Rate Test (CLRT) Program. The purpose of this TR is to complete the description of the CLRT Program for those AP1000 Combined Construction and Operating License (COL) applicants who choose to implement the methodology described in this report and close COL Information Item 6.2-1. Appendix A to this TR describes a CLRT Program that implements Option B (for performance-based requirements) of 10 CFR Part 50, Appendix J. COL Information Item 6.2-1 in Revision 15 of the AP1000 Design Control Document is found in Section 6.2.6, as follows:

### **"6.2.6 Combined License Information for Containment Leak Rate Testing**

The Combined License applicant is responsible for developing a 'Containment Leakage Rate Testing Program' which will identify which Option is to be implemented under 10 CFR 50, Appendix J. Option A defines a prescriptive-based testing approach whereas option B defines a performance-based testing program."

## 2.0 Regulatory Criteria

Conformance with the requirements of Option A of Appendix J, or the requirements of Option B of Appendix J and the provisions of RG 1.163, Performance-Based Containment Leak-Test Program, constitutes an acceptable basis for satisfying the requirements of the following General Design Criteria applicable to containment leakage rate testing:

1. General Design Criterion 52 (GDC 52), "Capability for Containment Leakage Rate Testing," as it relates to the reactor containment and exposed equipment being designed to accommodate the test conditions for the Containment Integrated Leakage Test (up to the containment design pressure).
2. General Design Criterion 53 (GDC 53), "Provisions for Containment Testing and Inspection," as it relates to the reactor containment being designed to permit appropriate inspection of important areas (such as penetrations), an appropriate surveillance program, and leakage rate testing at the containment design pressure of penetrations having resilient seals and expansion bellows.
3. General Design Criterion 54 (GDC 54), "Piping Systems Penetrating Containment," as it relates to piping systems penetrating primary reactor containment being designed with a capability to determine if valve leakage rate is within acceptable limits.

### **3.0 Technical Background and Evaluation**

Pursuant to the DCD, the AP1000 reactor containment, containment penetrations, and isolation barriers are designed to permit periodic leak rate testing in accordance with GDC 52, 53 and 54. The CLRT system is designed to verify that leakage from the containment remains within limits established in the AP1000 Technical Specifications, DCD Chapter 16. Leak rate testing requirements are defined by 10 CFR Part 50, Appendix J, which classifies leak tests as Types A, B and C. The system design accommodates the test methods and frequencies consistent with requirements of 10 CFR Part 50, Appendix J, Option A (prescriptive requirements) or Option B (performance-based requirements). This TR describes an operational program implementing Option B as stated in Technical Specification Basis B3.6.1.

The CLRT Program using Option B is established in accordance with NEI 94-01, Industry Guidelines for Implementing Performance Based Option of 10 CFR 50, Appendix J, Rev. 0, as modified and endorsed by the NRC in RG 1.163, Performance-Based Containment Leak-Test Program, September 1995.

Schedules for the performance of periodic Type A, B, and C leak rate tests are in accordance with NEI 94-01, as endorsed and modified by RG 1.163, and therefore acceptable.

Option B will be employed by the licensees that choose to implement this TR. Appendix A to this TR completes the program description provided in Section 6.2 of the DCD by identifying the specific test frequencies and test acceptance criteria for containment leakage rate tests. There are no proposed departures from the DCD associated with this supplemental material.

### **4.0 Conclusion**

Based on its review, the staff finds acceptable the proposed report, AP-TR-NS01, Revision 1, which provides the supplemental material needed to fully describe the CLRT Programs for applicants implementing 10 CFR Part 50, Appendix J, Option B, and closes the associated COL Information Item.

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