



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO THE INSERVICE TESTING PROGRAM REQUESTS FOR RELIEF  
SURRY POWER STATIONS UNIT 1 AND 2  
DOCKET NUMBERS 50-280 AND 50-281

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda, except where specific written relief has been requested by the licensee and granted by the Commission pursuant to 10 CFR 50.55a(f)(6)(i) or where the alternative has been authorized pursuant to 50.55a(a)(3)(i) or (a)(3)(ii). In requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. The NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable IST Programs," provided alternatives to the Code requirements determined to be acceptable to the staff.

10 CFR 50.55a authorizes the Commission to grant relief from or approve alternatives to ASME Code requirements upon making the necessary findings. The NRC staff's findings with respect to granting or not granting the relief requested or authorizing the proposed alternatives as part of the licensee's IST program are contained in this Safety Evaluation (SE).

This SE covers Relief Request V-50 for Surry Power Station, Units 1 and 2, as described in Virginia Electric and Power Company's (the licensee) letter dated February 21, 1992. The licensee's program is based on the requirements of the 1983 Edition of the ASME Section XI Code through the Summer of 1983 Addenda.

2.0 RELIEF REQUEST V-50

The licensee requested interim relief from ASME Code Section XI, IWV-3520 "Tests for Check Valves," requirements for exercising valves to the closed position during plant operation at least once every 3 months. The valves in Relief Request V-50 are non-return main steam line stop check valves. The valves involved are 1-MS-NRV-101 A, B and C for Unit 1 and 2-MS-NRV-201 A, B and C for Unit 2.

9301250105 930119  
PDR ADDCK 05000280  
P PDR

## 2.1 BASIS FOR INTERIM RELIEF

The licensee currently exercises and verifies these stop check valves closed by driving the valve stem down onto the disk using the valve motor operator, after the main steam system has been isolated, during plant cold shutdown. The licensee justified cold shutdown testing because full- or part-stroke exercising of these valves quarterly at power could result in a turbine or reactor trip.

The licensee considered the current method a valid ASME Code closure test for stop check valves based on the staff response to Question No. 25, conveyed in the "Minutes of the Public Meeting on Generic Letter 89-04," issued on October 25, 1989. However, based on the supplement to the minutes issued on September 26, 1991, which clarified the response to Question No. 25 with regard to closure verification of stop check valves, the licensee finds the test method is not adequate. Condition "C" of the supplement states, "If prompt closure of these valves on cessation or reversal of flow is required to accomplish a safety-related function, closure must be verified by reverse flow testing or such other positive means as acoustic monitoring or radiography."

The licensee considers reverse flow testing to be impractical at power or during cold shutdown. The stop check valve is needed during cold shutdown to ensure double valve isolation of the secondary plant piping from the steam source.

## 2.2 ALTERNATE INTERIM TESTING

The licensee proposes to develop, test and evaluate one or more non-intrusive methods during the 1993 Unit 2 refueling outage. The methods involve application during the cold shutdown process. The most practical method will be selected and implemented at both Surry units during subsequent cold shutdowns.

During the interim, prior to implementing the new test methods, the licensee proposes to continue the current test method every cold shutdown at the Surry Power Station, Units 1 and 2. The licensee states that the current test of driving the stem onto the disk is adequate to demonstrate that the disk is seated in the closed position and free movement of the disk is demonstrated when steam flow is established, at full power, and the disk travels from the seat to the full-open position.

## 2.3 EVALUATION

The main steam non-return valves 1-MS-NRV-101 A, B, and C and 2-MS-NRV-201 A, B, and C have a safety-related function to prevent reverse flow and limit blowdown to a single steam generator during a postulated steam line break.

The licensee has requested interim relief from ASME Code Section XI, IWV-3520, "Tests For Check Valves," requirements for verifying valve closure every three months during plant operation.

The licensee currently exercises these stop check valves to the closed position during cold shutdown by driving the stem down onto the disk using the valve motor operator. In addition, free movement of the valves is demonstrated by their travel from the seat to the full open position with steam flow during ascension to full power. Exercising these valves during plant cold shutdown is justified because closing these valves quarterly during power operations could result in a turbine or reactor trip.

Based on the supplemental response to Question No. 25 in "The Minutes of the Public Meeting Held on Generic Letter 89-04," issued on September 26, 1991, the licensee must verify closure by reverse flow testing or such other positive means as acoustic monitoring or radiography.

The licensee has requested an interim period to evaluate in-house and vendor-developed non-intrusive test methods, develop procedures and implement a test program for application during the cold shutdown process. The licensee will test one or more methods during the Surry Power Station Unit 2, 1993 refueling outage and implement the most practical test method following refueling outage of Unit 2. In the interim, the licensee proposes to proceed with the current test method to demonstrate valve closure while free movement of the disk is demonstrated by its travel from the seat to the full-open position with steam flow during ascension to full power.

It would be impractical to full- or part-stroke exercise these valves during power operation because this could cause a turbine or reactor trip. Furthermore, after the plant is shut down, back-seat testing these valves with air would require pressurizing under the disk to show free movement, and then pressurizing over the disk to verify closure. Given the mass of the 30" diameter disk and the large volume of pipe involved, lifting the disk off the seat to show free movement is not practical. The licensee proposes to develop and determine the practicality of using a non-intrusive method of closure verification testing during the process leading to cold shutdown.

The licensee has requested time to develop an adequate test method to verify closure of these valves on cessation or reversal of flow for compliance with Code requirements and NRC guidance. The licensee's proposal to continue the current method of demonstrating valve closure by driving the stem down onto the disk, and free movement of the disk by travel of the disk from the closed to open position during ascension to full-power steam flow provides an acceptable level of quality and safety for an interim period.

#### 2.4 CONCLUSION

Based on (1) the licensee's plans to develop and implement the use of non-intrusive testing techniques for these valves, (2) consideration of the time involved to develop and implement a non-intrusive alternative test, and (3) the current test method providing an acceptable level of quality and safety for an interim period, the licensee's request to continue the current

test method for an interim period until completion of the Surry Unit 2 refueling outage currently scheduled for the spring of 1993 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) provided the licensee implements a non-intrusive test method, for these valves, which will bring their testing program back into compliance with the ASME Code.

Principal Contributor: F. Grubelich

Date: January 19, 1993

Memorandum Dated January 19, 1993

Distribution

Docket File  
NRC & Local PDRs  
PDII-2 RF  
S. Varga  
G. Lainas  
B. Buckley  
E. Jordan  
H. Berkow  
E. Tana  
OGC  
ACRS (10)  
M. Sinkule, RII