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

September 16, 1988

Docket No. 50-461

MEMORANDUM FOR: Hubert J. Miller, Director
Division of Reactor Safety, RIII

THRU: Daniel R. Muller, Director
Project Directorate III-2
Division of Reactor Project III,
IV, V and Special Projects, NRR

DRM 9/16/88

FROM: Janice A. Stevens, Project Manager
Project Directorate III-2
Division of Reactor Project III,
IV, V and Special Projects, NRR

SUBJECT: RESPONSE TO REQUEST FOR NRR ASSISTANCE ON THE CLINTON ALLEGATION CONCERNING CONTAINMENT INTEGRITY AND THE INSERVICE TESTING PROGRAM (TIA III-2-88/TAC NO. 67447)

This memorandum responds to your request for technical assistance dated March 1, 1988 relating to allegations concerning deficiencies with the containment integrity at the Clinton Power Station and the Inservice Testing (IST) Program. A summary of the evaluation of these allegations is given below.

The alleger contends that the regulations (GDC-55 and GDC-56, 10 CFR Part 50, Appendix A) require, as a minimum, two containment isolation valves: one inside containment, and the other outside containment for each containment penetration. The penetration for high-pressure core spray (HPCS), low-pressure core spray (LPCS), and low-pressure core injection (LPCI) "C"/RHR "C" lines each have one outboard motor-operated valve and one inboard air-testable check valve, yet only the outboard motor-operated gate valves are being considered as containment isolation valves (CIVs). The alleger further contends that the inboard testable check valves should be considered as CIVs and should be tested as required in Appendix J, 10 CFR Part 50, and the penetration with the most leakage should be added to the running total for the containment building.

The Plant Systems Branch has reviewed the allegation concerning the primary containment integrity and agrees with the alleger that the four inboard testable check valves, 1E22F005, 1E51F006, 1E21F006, and 1E12F041C, should be considered as CIVs.

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The HPCS line penetrates the drywell to inject water into the reactor pressure vessel. Isolation of the reactor coolant pressure boundary is provided by an air-testable check valve (1E22F005) located inside the drywell and a remote, manually controlled, motor-operated gate valve (1E22F004) located outside the containment. The containment isolation is maintained by this outboard motor-operated gate valve. Similarly, for LPCS, reactor core isolation cooling (RCIC) and LPCI "C"/RHR "C" lines, the isolation criteria for the reactor coolant pressure boundary are accomplished by the use of inboard air-testable check valves (1E21F006, 1E51F066 and 1E12F041C) and outboard remote, manually controlled motor-operated gate valves (1E21F005, 1E51F013, and 1E12F042C) with position indicators in the control room. Both of these types of valves are normally closed, with the motor-operated valves receiving an automatic signal to open in the event of a loss-of-coolant accident. The licensee of the Clinton Plant has considered the outboard motor-operated valves as CIVS which are being tested as per the requirements given in Appendix J of 10 CFR Part 50. However, the licensee has not considered inboard testable check valves for containment isolation. The inboard testable check valves are considered pressure isolation valves (PIVs). These PIVs are hydraulically tested for a system differential pressure of 1000-psi once every 18 months. The leakage acceptance criterion for PIVs is 0.5 gpm per nominal inch of the valve diameter.

On the basis of its review of the FSAR and the plant Technical Specifications, the staff concludes that the four inboard air-testable check valves (1E21F005 for HPCS, 1E51F066 for RCIC, 1E21F006 for LPCS and 1E12F041C for LPCI "C"/RHR "C") should be considered as CIVs; therefore, these testable check valves should be included in Table 3.6.4-1 of the containment isolation valve in the plant Technical Specification, and should be tested in accordance with the requirements of Appendix J of 10 CFR 50. It should be noted that other Mark III plants conform to the arrangement that the inboard check valves are CIVs and are tested as required in Appendix J, 10 CFR Part 50.

It should also be noted that the testable check valves (1E12F041A and 1E12F041B) in LPCI "A" and LPCI "B" lines need not be considered CIVs. LPCI "A" and LPCI "B" lines that penetrate the containment have inboard remote-manually controlled, motor-operated, normally closed CIVs (1E12F042A and 1E12F042B), and outboard remote-manually controlled, motor-operated, normally open CIVs (1E12F027A and 1E12D027B). The outboard CIVs can be closed to provide containment isolation in the event of a high-energy line break inside containment. Thus, the design of containment isolation provisions satisfy the requirements of GDC 55, 56 and 57.

The decision to not allow the closed system as the second barrier for the penetrations containing the check valves in question centers upon the staff's desire to have two independent barriers for each containment penetration. For the ECCS systems, the suction penetration has a remote manual valve and a closed system. Although the system does not fully meet all staff requirements for a closed system, the staff has accepted it as the second barrier since the addition of a second valve would reduce the availability of the system. This is not true for the discharge line. For the discharge penetration, giving credit for the closed system outside containment would require using the same barrier for two penetrations. Consideration of the inside check valve as a containment barrier also does not reduce system availability. It is for the above reasons that the staff has concluded that the containment isolation barriers should include the check valves.

With respect to the issue of leak testing, the staff is currently discussing with the licensee the specific testing procedures to satisfy the leak testing requirements. It is the contention of the licensee that leak testing at full system pressure (i.e. 1000 psi) is equivalent to air testing at 15 psi. This full system pressure test is in a sense continuous since the check valve is always exposed to system pressure during operation. The staff is evaluating the merits of this approach. Until the staff completes the evaluation, adequate safety margins exist due to the testing that has been done as well as the fact that the systems are expected to function following a LOCA. Therefore isolation is not needed. It is only for the low probability event when the safety system needs to be isolated.

The above information completes our response to the allegation concerning Clinton containment integrity issues. As a separate NRR review, the Plant Systems Branch is evaluating the unique correlation between a 1000-psi water test and an Appendix J, Type "C" air test for inboard testable check valves as discussed above. A copy of this evaluation will be provided to you upon distribution.

The alleger also contends that certain valves in the Clinton plant that should have been inservice tested were not because they were not included in the Clinton IST program. There are about 108 valves involved in the allegation. The Mechanical Engineering Branch (EMEB) and the Idaho National Engineering Laboratory (INEL) have evaluated the safety-related function, if any, of all involved valves as well as 12 additional valves, i.e., IB21-F098A, B, C, D; IE12-F051A, B; IE12-F065A, B; and ICC065, 067, 068, 070.

The Code of Federal Regulations, paragraph 10 CFR 50.55a(g) requires safety-related valves in water-cooled nuclear reactor facilities to meet IST requirements stated in the ASME Code, Section XI, Subsection IWV, "Inservice Testing of Valves in Nuclear Power Plants." Per code requirements, a valve must be inservice tested if it performs an active safety function in shutting down the reactor or mitigating an accident. However, a valve may be exempted from inservice testing if it is only used for operating convenience, system control, or maintenance.

The EMEB and INEL's review of all specified valves indicates that 23 of the 120 valves are required to perform a safety-related function. Per Section XI requirements, these 23 valves should be included in the Clinton IST Program and inservice tested. With regard to the remaining 97 valves, 18 of them are used only for operating convenience and maintenance and are not required to be tested. The remaining 79 valves perform certain system functions; however, none of these valves perform an active safety function. Therefore, they are not required to be tested in accordance with Section XI.

Among the 23 valves that are required to be tested, 16 of them were added to the Clinton IST program in Revision 2, which became effective on June 30, 1987. The commercial date of the Clinton Power Station was April 24, 1987. The NRC regulations and ASME Code, Section XI require that the first inservice test for most valves be performed within three months after commercial operation. For Clinton, the first IST occurred during July 1987. Ten (10) of these 16 affected valves (Table I, Valve No. 1 thru 16) were not tested during the first scheduled IST but were all tested during September/October 1987. Since then, these valves have been tested in accordance with Section XI requirements and have been verified operable. This information is based on verbal input from Region III. Although these 16 valves might not have been included in the IST program at the time of the allegation, they were incorporated shortly after the first scheduled inservice testing. Thus, although the allegation had merit at the time it was made, the early omission of valves from the IST program has not resulted in any real safety impact to the Clinton Plant.

As a result of interactions with the licensee, seven additional valves (Table I, Valve No. 17 thru 23) were added to the Clinton IST program, Revision 5, dated May 27, 1988. This was about one year after commercial operation. A safety evaluation of each valve, missing from the IST for slightly more than a year, is discussed below.

Four of these valves (IE12-F051A, B and F065A, B) were designed to be used during the steam condensing mode of the Residual Heat Removal System. This mode is not intended to be used any longer at Clinton and steps were taken to delete this mode and also these valves from the IST program. Although the staff finds that these four valves should have been subjected to IST prior to their removal from the IST program, not testing them during the past year presented minimal impact to the safety of plant operations simply because this mode of operation is not to be used at the Clinton Plant.

Valve IFC091 is a relief valve. Section XI requires a relief valve to be tested approximately on a five-year cycle. Not testing this valve during its first year of the IST program does not violate Section XI requirements, and therefore presents no safety concerns.

Valves IE12-F040 and -F049 are part of the Residual Heat Removal System which provides shutdown cooling for the reactor. These two valves were added to the IST program (Rev. 5) and were tested on July 27, 1988. They were both found operable. This information is based on verbal input from Region III. Since the recent test has verified the operability of these valves, the safety significance of not testing them more frequently as required by Section XI is minimal.

Based upon the discussion above, the staff finds that approximately 20 percent of the valves in the allegation are required to perform a safety-related function while the rest are not. Those valves that are required to be inservice tested are now included in the Clinton IST Program. Furthermore, the staff finds that the safety significance of not performing inservice testing of certain affected valves during the first year of plant operation is minimal. As such, the staff concludes that no further action is required and that this allegation is resolved.

For further information or clarification, please contact me at 492-1397.

Janice A. Stevens

Janice A. Stevens, Project Manager
Project Directorate III-2
Division of Reactor Projects III,
IV, V and Special Projects, NRR

cc: R. Cooper, RIII
D. Danielson, RIII
J. Kudrick, PSB
J. Huang, MEB

TABLE I

VALVES THAT ARE REQUIRED TO BE INSERVICE TESTED

Valve No.	Valve Identification
1,2	OVC10A, B
3,4	OVC17A, B
5,6	OVC20A, B
7,8	OVC25A, B
9,10	1B21-F001, F002
11,12	1E12-F037A, B
13,14	1FC085A, B
15,16	1E51-F004, F005
17,18	1E12-F051A, B
19,20	1E12-F065A, B
21,22	1E12-F040, F049
23	1FC091

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