

EVALUATION OF LRG-II POSITION PAPER ON
PERIODIC LOW PRESSURE LEAKAGE
TESTING OF THE DRYWELL

ISSUE 3-CSB

Background

The Standard Review Plan (SRP) in Appendix A to Section 6.2.1.1.C (NUREG-0800, Revision 5, dated January 1983) calls for post-operational low pressure leakage tests to be performed on each MARK III containment to detect the potential for steam to bypass the suppression pool. The SRP further provides that these tests be performed at each refueling outage at a differential pressure corresponding to approximately the submergence of the vents.

Based on the above described provisions of the SRP, the staff has been requiring commitments from all MARK III applicants to perform a low pressure test of the drywell at that pressure needed to maintain the water level in the suppression pool slightly above the elevation of the first row of vents, at intervals not exceeding 18 months. The staff believes that this testing reduces the potential for steam bypass of the suppression pool by leakage through the drywell purge valves, vacuum breakers, or from leak paths in the drywell penetration seals or cracks in the drywell structure itself, thereby ensuring that the containment design pressure is not exceeded.

LRG-II Position

The following are the LRG-II positions regarding the low pressure drywell leakage tests:

- a. The LRG-II position for low-pressure leakage testing of the drywell is that the test will be performed in conjunction with the overall integrated leakage rate tests (Type A) at intervals consistent with the

requirements of 10CFR50, Appendix J for the Type A tests. The LRG propose that if any of these low pressure leak tests results in leakage values greater than the Technical Specification limits, then the low pressure tests will be performed at least once per 18 months until two consecutive tests meet the specified limit.

- b. The LRG notes that the Mark III plant applications for operating licenses were docketed prior to issuance of Rev. 5 to Section 6.2.1.1.C of the SRP and that Rev. 3 to Section 6.2.1.1.C of the SRP in effect at the time of the LRG-II plants docketing, states on page 6.2.1.1.C that "low pressure leakage tests of the drywell should be done periodically..." (i.e., no requirement for an 18 month testing frequency). The LRG further notes that 10CFR50.34(g), "Conformance with the Standard Review Plan", does not require an evaluation of facilities docketed after May 17, 1982 against Rev. 5 of the plan, and notes that 10CFR50.34(g) states that "compliance (with the SRP) is not a requirement."

Staff Position

The following are the staff's positions regarding the low pressure drywell leakage tests:

- a. The low pressure leakage testing of the drywell, as embodied in Appendix A to SRP Section 6.2.1.1.C, is a special test designed to ensure that there are no potential bypass leakage paths of the drywell greater than 10% of the design capability of the containment.

The consequences of steam bypass of the suppression pool are very severe, and could result in containment overpressurization with accompanying structural damage. It should further be noted that the vacuum breakers and the drywell purge valves are not leak tested at any other time except during the 18 month low pressure test.

The LRG recommends testing the drywell at low pressure at the same frequency as the Appendix J, Type A tests. Appendix J is primarily in place to ensure the leak tight integrity of the containment (Type A tests), the containment isolation valves (Type C tests) and the containment penetrations (Type B tests). These tests provide assurance that there are no excessive radioactive releases to the environment after an accident which could be damaging to the public's health and safety. Appendix J does not address leak testing of the drywell or the consequences of steam bypass of the suppression pool. As a result, the SRP provides the only guidance available for leak testing the drywell.

Therefore, the staff believes that since the consequences of an accident in which the steam would bypass the suppression pool are much more severe than the consequences of containment leakage, the guidance provided by the SRP should be followed and the low pressure tests for the integrity of the MARK III drywells be conducted every 18 months.

- b. Revision 3 to Section 6.2.1.1.C of the SRP does indicate that low pressure leak tests for Mark III containments should be conducted periodically, while Appendix A to this Section explicitly states that for Mark II containments, the low pressure tests should be conducted at each refueling outage.

The intent of Revision 3, although not explicitly stated, was that the containment low pressure leak tests be conducted at 18 month intervals for Mark I, II and III containments. This position on the frequency of low pressure testing has been held by the staff in all discussions with both applicants and licensees of Mark I, II and III containments.

As a result of the ambiguity on the frequency of low pressure testing for Mark III containments in Revision 3, the SRP was modified in Revision 5 to explicitly state in Appendix A to Section 6.2.1.1.C, that post-operational low pressure leak tests should be performed on each Mark I, II and III unit at each refueling outage.

The staff believes that the guidance provided by the SRP in both Revision 3 and Revision 5 to the SRP should be followed and the drywell tested at 18 month intervals.