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July 20, 1983

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Limerick Generating Station, Units 1&2
Containment Systems Branch Open Items

Reference: Telecon between Containment Systems Branch and Philadelphia Electric Company on July 17, 1983

File: GOVT 1-1 (NRC)

Dear Mr. Schwencer:

The attached documents are draft changes to FSAR Sections 1.13 and 6.2.4.3.1.2.1.1 prepared as a result of the referenced telecon.

The information contained on these draft FSAR page changes will be incorporated into the FSAR, exactly as it appears on the attachments, in the revision scheduled for August, 1983.

Sincerely,

Eugene J. Bradley

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Attachment

Copy to: See Attached Service List

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containment isolation barriers, are maintained. All power-operated isolation valves have position indicators in the control room. Discussion of instrumentation and controls for the isolation valves is included in Chapter 7.

6.2.4.3.1 Evaluation Against General Design Criteria

6.2.4.3.1.1 Evaluation Against General Design Criterion 54

All piping systems penetrating containment, other than instrument lines, are designed in accordance with Criterion 54.

6.2.4.3.1.2 Evaluation Against Criterion 55

Criterion 55 requires that lines which penetrate the primary containment and form a part of the RCPB must have two isolation valves; one inside the containment and one outside, unless it can be demonstrated that the containment isolation provisions for a specific class of lines are acceptable on some other basis.

The RCPB, as defined in 10 CFR Part 50, Section 50.2 (v), consists of the reactor pressure vessel, pressure retaining appurtenances attached to the vessel, and valves and pipes that extend from the reactor pressure vessel up to and including the outermost isolation valve.

6.2.4.3.1.2.1 Influent Lines

Influent lines that penetrate the primary containment and connect directly to the RCPB are equipped with at least two isolation valves, one inside the drywell, and the other as close to the external side of the containment as practicable.

6.2.4.3.1.2.1.1 Feedwater Line

The feedwater lines are part of the RCPB as they penetrate the drywell to connect with the reactor pressure vessel. Each of the two feedwater penetrations is provided with a series arrangement of three isolation valves:

a. A check valve is provided inside the drywell as close to the containment wall as practicable. For a worst-case break of a feedwater line inside containment, it would be impossible to ensure the operability of the inboard check valve due to pipe whip forces.

b. A spring-assisted check valve is provided outside the drywell as close to the containment wall as practicable. The spring forces the valve flapper in the closed direction, thus providing added assurance of valve seating in the event of low pressure in the supply piping. The spring will not prevent flow in the

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downstream (toward the vessel) direction but does create some flow restriction. An air operator is provided with the check valve assembly. This air operator is normally pressurized, thus compressing the spring and reducing the flow restriction. Depressurizing the air operator during normal operation allows the spring to partially move the valve disc into the flow stream to facilitate periodic valve operability testing.

c. A motor-assisted check valve is provided in the feedwater line outboard of the above described spring-assisted check valve. The function of these valves is to:

   1. Prevent HPCI, RCIC, and RWCU water from flowing upstream in the feedwater line, thus ensuring flow into the reactor vessel.

   2. Provide isolation in the event of a feedwater line break.

   Additional isolation valves are provided on each of the lines connecting to the feedwater lines inboard of these motor-assisted check valves:

   1. Motor operated valves are provided on the HPCI, RCIC, and long path recirculation lines.

   2. A spring-assisted check valve is provided on the RWCU supply line. This valve is of a design similar to the outboard spring-assisted feedwater check valves described above. Although not a containment isolation valve, a motor-operated valve is provided outboard of the spring-assisted RWCU check valve to provide isolation of this flow path in the event of a feedwater or RWCU line break downstream of the spring-assisted RWCU check valve.

Because it is desirable to maintain all sources of makeup to the reactor vessel in the event of a LOCA, all isolation provisions associated with makeup through the feedwater penetrations are based on flow direction (i.e., check valves) or are remote-manually operated from the control room (i.e., motor operated valves, check valve motor operators, and air operators associated with spring-assisted check valves). The long path recirculation lines do not serve a vessel makeup function and will therefore be provided with control interlocks or administratively sealed closed (in accordance with SRP 6.2.4.III.f. definition) whenever reactor pressure is greater than 600 psig. Appropriate administrative controls will be addressed in the plant operating procedures.

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Position (2), Clarification (3)

All systems penetrating containment have been evaluated and identified as either essential or nonessential. Table 6.2-17 provides the results of this evaluation for each line, and Table 6.2-27 provides the basis for the selection of essential/nonessential systems.

Position (3), Clarification (2)

Systems determined to be nonessential are provided with diverse, automatic isolation signals, except as described in the response to Position (1). Manual valves are sealed closed as discussed in Section 6.2.4.3.

Position (4), Clarifications (4), (5)

The control systems for automatic isolation valves are such that resetting the isolation signal will not result in the automatic reopening of these valves. Ganged reopening of containment isolation valves is performed only where the operation of multiple valves is required for system operation. Sample inlet and return valve controls for the drywell radiation monitors and combustible gas analyzers are ganged as described in Sections 6.2.4.3.1.3.2.8 and 6.2.4.3.1.3.2.1. Reactor enclosure cooling water and drywell chilled water valve controls are ganged as described in Sections 6.2.4.3.1.3.2.10 and 6.2.4.3.1.3.2.11.

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Position (5), Clarification (6)

The setpoint for the drywell high pressure isolation signal is set at the minimum compatible with normal operation. Section 7.3.1.1.2.4.6 describes the selection of the drywell high pressure setpoint.

Position (6), Clarification (7)

Containment purge valves comply with Branch Technical Position CSB 6-4 as discussed below. Two purge isolation valves have closure times greater than 5 seconds: 2"-HV-105 and 2"-HV-111 have closure times of 30 seconds. An analysis of the radiological consequences of a LOCA that occurs during purging was performed to justify the line size and the valve closure time used in the purge system. Using the assumptions of BTP CSB 6-4, the resulting doses were a small fraction of the 10CFR100 limits. For local leak rate tests, the leakage rate of the purge isolation valves, combined with the leakage rate for all other penetrations and valves subject to Type B and C tests will be less than 0.60 La, in accordance with Appendix J to 10CFR50.

Position (7)

The containment purge isolation valves isolate on receipt of any one of the following safety-related isolation signals:

a. high drywell pressure

b. reactor low water level

c. reactor enclosure high radiation

d. refueling floor high radiation

In addition to the safety-related isolation signals listed above, the containment purge and vent isolation valves (HV-114, 115, 104, 112, 123, 124, 135, 147, 121, 131, 109) ~~3 inches in diameter~~ ~~greater than~~ will isolate on receipt of a nonsafety-related north stack effluent high radiation signal (see Section 7.6.1.1 and 11.5).

An analysis has been performed to demonstrate that the offsite doses that might result if a LOCA were to occur during purging operations would be less than both 10CFR100 and EPA Protection Action Guide limits. This analysis used the assumptions of NUREG 0800 Section 6.2.4 and Branch Technical Position CSB 6-4 and assumes a pre-existing spike that results in coolant activity levels in excess of Technical Specification limits. The analysis methodology was in accordance with the letter from T.J. Dente (BWR Owners Group) to D.G. Eisenhut (NRC) "Supplement to BWR Owners Group Evaluation of NUREG 0737 Item II.E.4.2(7)", dated June 14, 1982.

- INSERT (A), PAGE FOLLOWING

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INSERT (A), PG. 1.13-39

THE SETPOINT OF THIS ISOLATION SIGNAL (~ 4 μCi/cc) HAS BEEN SELECTED TO ASSURE VALVE CLOSURE BEFORE OFFSITE DOSES EXCEED EPA PROTECTIVE ACTION GUIDE LEVEL 2 LIMITS (1 REM WHOLE BODY / 5 REM THYROID). CONTAINMENT PURGING WILL NOT BE UNDERTAKEN DURING PERIODS OF POWER OPERATION WHEN THIS MONITOR IS OUT OF SERVICE UNLESS A TEMPORARY REPLACEMENT OF EQUIVALENT SENSITIVITY IS UTILIZED. PROVISIONS WILL BE INCLUDED IN THE TECHNICAL SPECIFICATIONS FOR PERIODIC INSTRUMENT CALIBRATIONS AND CHANNEL CHECKS.

ISOLATIONS INITIATED BY THIS HIGH RADIATION SIGNAL WILL BE "SEALED IN" UNTIL MANUALLY RESET FOLLOWING VERIFICATION THAT CONTAINMENT PURGING WAS NOT THE SOURCE OF RADIATION DETECTED BY THE MONITORS.