Technical Specification Change Request No. 13, Rev. 1 (Appendix A)

Replace pages 3/4 6-8, 3/4 6-9, 3/4 6-9a and B 3/4 6-2 with the attached revised pages 3/4 6-8, 3/4 6-8a, 3/4 6-9, 3/4 6-9a and B 3/4 6-2.

Proposed Change

Revise Specification 3/4.6.1.6 to allow for a testing in accordance with Regulatory Guide 1.35, "Inservice Inspection of Ungrouted Tendons in Prestressed Concrete Containments," Proposed Rev. 3, April 1979; to include testing of partially retensioned dome tendons; to correct typographical errors in the Dome Specification; and to delete the acceptable strain level for radial reinforcement as a required consideration in evaluating changes in elevation.

Reason for Proposed Change

The present Specification for the Containment Structural Integrity does not allow for the reduction in prestress force of the tendons over time, which is a natural occurrence. In order to allow for this reduction in prestress force over time and to more fully evaluate the tendons, a new surveillance program was developed using Proposed Rev. 3 to Regulatory Guide 1.35, April 1979. Also, the ACTION statement has been changed to require shutdown only when the average normalized prestress levels are below acceptable limits because this is indicative of degradation of the tendons. All other surveillance requirements may show indications of degradation but this must be verified. The new Specification also requires the testing of one of the partially retensioned dome tendons during each of the inspections.

The number of tendons to be included in each representative sample was determined using Regulatory Position C.2 of the above Regulatory Guide and is explained in the following table:

Tendon Type	Total	4% of Each Type	Δ To Be Inspected ($4 \leq \Delta \leq 10$)	2% of Each Type	Δ To Be Inspected ($3 \leq \Delta \leq 5$)
Dome	105	4.2	4	2.1	3
Vertical	144	5.76	6	2.88	3
Hoop	282	11.24	10	5.62	5
Partially Retensioned Dome	18	N/A	1	N/A	1

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Safety Analysis Justifying Proposed Change

The present tendon surveillance program was developed using Rev. 1 of Regulatory Guide 1.35, dated June 1974. This Technical Specification Change will update the program to be in line with the latest NRC guidance on tendon surveillance, i.e., proposed Rev. 3.

This specification ensures that the structural integrity of the containment will be maintained comparable to the original design standards for the life of the facility and it does not diminish any requirement applicable to the Safety Analysis. Therefore, no unreviewed safety question is involved.

LIMITING CONDITIONS FOR OPERATION

3.6.1.6 The structural integrity of the containment shall be determined in accordance with the criteria in Specification 4.6.1.6.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the structural integrity of the containment not conforming to the requirements of Specification 4.6.1.6.1.b, perform an engineering evaluation of the structural integrity of the containment to determine if COLD SHUTDOWN is required. The margins available in the containment design may be considered during the investigation. If the acceptability of the containment tendons cannot be established within 48 hours, restore the structural integrity to within the limits within 24 hours or be in least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With the structural integrity of the containment not conforming to the requirements of Specification 4.6.1.6, submit a report to the Commission in accordance with Specification 6.9.1. This report shall include a description of the tendon condition, the condition of the concrete (especially at tendon anchorages), the inspection procedures, the tolerances on cracking, and the corrective actions taken. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.6.1.6.1 Containment Tendons The containment tendons' structural integrity shall be demonstrated at the end of one, three and five years following the initial containment structural integrity test and at five-year intervals thereafter. The tendons' structural integrity shall be demonstrated by:

a. Determining that in a representative sample* of at least 20 tendons (4 dome, 6 vertical, and 10 hoop), each tendon has a

*For each inspection, the tendons shall be selected on a random but representative basis so that the sample group will change somewhat for each inspection; however, to develop a history of tendon performance and to correlate the observed data, one tendon from each group (dome, vertical, and hoop) may be kept unchanged after the initial selection.

lift-off force equal to, or greater than its lower limit predicted for the time of the test as defined in Regulatory Guide 1.35, "Inservice Inspection of Ungrouted Tendons in Prestressed Concrete Containments," Proposed Rev. 3, April, 1979.

If the lift-off force of a selected tendon lies between the prescribed lower limit and 90% of that limit, one tendon on each side of this tendon shall be checked for their lift-off forces. If the lift-off forces of the adjacent tendons are equal to, or greater than their prescribed lower limits at the time of the test, the single deficiency shall be considered unique and acceptable. If the lift-off force of either of the adjacent tendons lies below the prescribed lower limit for that tendon, the condition is reportable.

If the lift-off force of any one tendon lies below 90% of its prescribed lower limit, that tendon shall be considerd a defective tendon. It shall be completely detensioned and a determination made as to the cause of the occurrence. The condition is reportable.

If the inspections performed at one, three, and five years indicate no abnormal degradation of the post-tensioning system, the number of tendons checked for lift-off force during subsequent tests may be reduced to a representative sample of at least 11 tendons (3 dome, 3 vertical, and 5 hoop).

In addition to the above representative sample, each inspection period shall include the measurement of the lift-off force for one tendon selected from the 18 dome tendons which were partially retensioned following initial installation. The acceptance criteria for lift-off force for this additional tendon shall be the same as for the representative sample outlined above, except that adjacent tendons shall be selected from the partially retensioned dome tendons.

b. Determining that the average of all normalized tendon lift-off forces for each tendon group (dome, vertical, and hoop) is equal to, or greater than 1,215,000 pounds for dome tendons, 1,149,000 pounds for vertical tendons, and 1,252,000 pounds for hoop tendons. If this requirement is not met, the condition is reportable and an additional sample of 4%, with a minimum of four and a maximum of ten, of the same group of tendons shall be inspected. If the total population of sampled tendons meets the criteria above, the structural integrity of the containment shall be considered acceptable.

c. Detensioning one tendon in each group (dome, vertical, and hoop) from the representative sample. One wire shall be removed from each detensioned tendon and examined to determine:

1. That over the entire length of the wire, the tendon wires have not undergone corrosion, cracks or damage beyond that which was originally recorded and the extent of corrosion is within specified acceptable limits. Failure to satisfy these limits is a reportable condition.

2. A minimum tensile strength value of 240,000 psi (guaranteed ultimate strength of the tendon material) for at least three wire samples (one from each end and one at mid-length) cut from each removed wire. Failure of any one of the wire samples to meet the minimum tensile strength test is reportable.

d. Determining for each tendon in the above representative sample, that the sheathing filler grease is within acceptable limits as to:

a. presence of voids
b. presence of free water
c. chemical and physical properties

Failure of the grease to meet acceptable limits is reportable.

4.6.1.6.2 End Anchorages and Adjacent Concrete Surfaces The structural integrity of the end anchorages of all tendons inspected pursuant to Specification 4.6.1.6.1 and the adjacent concrete surfaces shall be demonstrated by determining through inspection that no apparent changes have occurred in the visual appearance of the end anchorage or the concrete crack patterns adjacent to the end anchorages. Any apparent changes in the visual appearance or the concrete crack patterns is reportable.

4.6.1.6.3 Containment Surfaces The structural integrity of the exposed accessible interior and exterior surfaces of the containment, including the liner plate, shall be determined during the shutdown for each Type A containment leakage rate test (Specification 4.6.1.2) by a visual inspection of these surfaces. This inspection shall be performed prior to the Type A containment leakage rate test to verify no apparent changes in appearance or other abnormal degradation. Any apparent change in appearance or other abnormal degradation is reportable.

4.6.1.6.4 Containment Dome The containment dome's structural integrity shall be demonstrated at the end of 1 year, 18 months, 2 years, 3 years, 40 ± 10 months (coincident with the first periodic integrated containment leak rate test) and 5 years following the initial containment structural integrity test. The dome's structural integrity shall be demonstrated by:

a. Measuring the elevation difference of 7 dome survey points (1 at the apex; 3 at a radius of ~29 feet at azimuths 90°, 215° and 334°; and 3 at a radius of ~49 feet at azimuths 90°, 215° and 334°) and 3 benchmarks (on Ring Girder at azimuths 90°, 215° and 334°) along the respective azimuths. These elevation differences shall be compared to the elevation differences established by the Baseline Survey. If the containment is in a normal operation/shutdown mode, the acceptable change in elevation differences will be based on consideration of expected movement and survey accuracy. If the containment is in a pressurized mode for a periodic containment integrated leak rate test, the acceptable changes in elevation differences will be similar to that for the initial containment structural integrity test applied to the elevation differences during the periodic containment integrated leak rate test. Changes of a greater magnitude shall require an engineering evaluation and are reportable.

b. Measuring crack widths and plotting crack patterns in the area of the dome 3 feet on either side of azimuth 195° from the apex to the Ring Girder. Cracks wider than 0.010 inches will be plotted and cracks wider than 0.040 inches shall require an engineering evaluation. In addition, a general visual inspection of the entire dome surface area shall be performed.

3/4.6.1.4 INTERNAL PRESSURE

The limitations on containment internal pressure ensure that 1) the containment structure is prevented from exceeding its design negative pressure differential with respect to the outside atmosphere of 3.0 psig and 2) the containment peak pressure does not exceed the design pressure of 54.6 psig during LOCA conditions.

The maximum peak pressure obtained from a LOCA event is 49.6 psig. The limit of 3 psig for initial positive containment pressure will limit the total pressure to 52.6 psig which is less than the design pressure and is consistent with the safety analyses.

3/4.6.1.5 AIR TEMPERATURE

The limitations on containment average air temperature ensure that the overall containment average air temperature does not exceed the initial temperature condition assumed in the accident analysis for a LOCA.

3/4.6.1.6 CONTAINMENT STRUCTURAL INTEGRITY

This limitation ensures that the structural integrity of the containment will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the containment will withstand the maximum pressure of 52.6 psig in the event of a LOCA. The measurement of containment tendon lift off force, the tensile tests of the tendon wires, the visual examination of tendons, anchorages and exposed interior and exterior surfaces of the containment, the measurement of dome elevation differences and cracks, the general visual inspection of the dome and the Type A leakage test are sufficient to demonstrate this capability. Tendon lift-off forces are normalized to be indicative of the average level of initial lift-off forces by adjusting for differences which exist among the tendons due to initial lock-off force and elastic shortening loss.