UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

SAFETY EVALUATION BY THE NUCLEAR REGULATORY COMMISSION

RELATED TO AMENDMENT NO. TO FACILITY OPERATING LICENSE DPR-34

PUBLIC SERVICE COMPANY OF COLORADO

FORT ST. VRAIN NUCLEAR GENERATING STATION

DOCKFT 50-267

INTRODUCTION

A letter was sent to all power reactor licensees (except SEP licensees) on November 20, 1980 (Ref. 1), requesting the upgrading of hydraulic shock suppressor (snubber) testing requirements and the inclusion of mechanical snubber operability and testing requirements in the Technical Specifications (TS's). As a result of a review of the Fort St. Vrain (FSV) TS's in late 1982 and discussions with Public Service Company of Colorado (PSC or the licensee) personnel, it was discovered that this request was never received at FSV. The request was then retransmitted to PSC by letter dated December 28, 1982 (Ref. 3).

PSC responded to the NRC request by application dated May 20, 1983 (Ref. 2); however, the ongoing PSC Seismic Redocumentation Program had not been completed so that the snubber listings had not been completely verified. The redocumentation program, which was subsequently completed and reported by letter dated August 8, 1983 (Ref. 5), explained that the reviewed hydraulic snubber listing and new mechanical snubber listing would be provided in a supplement to the May 20, 1983 application. A complete resubmittal of the application was provided by letter dated September 28, 1983 (Ref. 4), in order to ensure consistent formatting due to the inclusion of the revised snubber listings and clarifying statements. These changes were considered to be administrative-type clarifications and did not significantly alter the original application. (The only change to the operability requirements is the inclusion of a Table listing the mechanical snubbers.)

BACKGROUND

In the time period of 1973 to 1975, numerous discoveries of inoperable snubbers resulted in surveillance requirements being placed in the TS's for operating nuclear power plants. However, several deficiencies were identified after the original requirements had been in force for several years. These deficiencies were:

1. Mechanical snubbers were not included in the original requirements.

   - Inasmuch as mechanical snubbers were not subject to any surveillance requirements and because the most likely failure of an untested mechanical snubber is permanent lock-up, which is a failure mode that can be harmful to the associated system even during normal plant operations, surveillance testing is clearly warranted.

2. In-service testing of large snubbers was not required.

   - When the hydraulic snubber surveillance requirements were first drafted, a compromise was made that limited the testing of snubbers to those with rated capacities of not more than 50,000 pounds because of the (a) limited capacity of the available test equipment and (b) poor understanding of some test parameters at the snubber rated load. Since then, greater equipment capacity and better understanding of parametric correlations have both ensued.

3. The use of new types of seal materials required NRC approval.

   - The original problems with hydraulic snubbers were primarily attributed to leaking seals. Most seal materials of the 1973 vintage did not have adequate resistance to the thermal and fluence conditions of their service environments. Ethylene propylene was the first material that could provide a reasonable service life for those seals. In order to discourage the use of unproven material for those seals, the words "NRC approved material" were used in the TS; and, on many occasions, staff members were asked to approve different seal materials. Consequently, since the basis for the approval was not defined, the development of better seal materials by the industry was actually discouraged.

4. In-service test requirements were not clearly defined.

   - The poorly defined acceptance criteria in the earlier version of the testing requirements resulted in non-uniform interpretation and implementation. In some cases, snubbers were tested without reference to acceptance criteria resulting in completed tests of questionable value.

5. In-place, in-service testing was not permitted.

   - Testing of snubbers was usually accomplished by removing snubbers from their installed positions, mounting them on a testing rig, conducting the test, removing them from the rig, and re-installing them in their service positions. Snubbers were occasionally damaged during this process, and this unfortunately defeated the purpose for conducting the tests. New methods and equipment that permit in-place testing minimize potential snubber damage and utility outlays.

From these shortcomings, it was concluded that the snubber surveillance requirements for the TS should be revised. This issue was then categorized into two Multi-Plant Action Items: B-17, "TS Surveillance for Hydraulic Snubbers," and B-22, "TS Surveillance for Mechanical Snubbers." Generic guidance was then sent to PSC and others via NRC's letter dated November 20, 1983 (Ref. 1). It was determined later that this guidance was never received by PSC. Consequently, a second transmittal of the information was made by Reference 3.

EVALUATION

On May 20, 1983, PSC submitted (Ref. 2) revised snubber TS's for FSV. The FSV TS's were patterned after the model TS's (Ref. 1) but were somewhat upgraded to be more consistent with the more recent versions of the standard TS employed for recently licensed plants. Since a complete rereview of all snubbers had not been completed at that time, a supplemental submittal, which incorporated the final data on all safety-related snubbers, was made on September 28, 1983 (Ref. 4). The modified FSV TS's provide for the following:

1. Mechanical snubber surveillance.

2. Testing of all snubber types irrespective of capacity.

3. A seal service life monitoring program that assures all snubbers are functioning within their service life.

4. Clearly defined in-service test requirements.

5. In-place, in-service testing.

The NRC staff examined these and other proposed alternatives (i.e., testing frequency, sampling distribution, etc.) to the FSV TS's and concluded that the PSC submittal (Ref. 4) is responsive to the NRC's request but that some additional clarifications were needed to remove confusion on the interpretation of the requirements.

The additional changes which were incorporated into the TS's are as follows:

1. Section 5.3.8 b) "Visual Inspection Acceptance Criteria"

   - A statement was added to clarify that an uncovered fluid port of a hydraulic snubber requires declaring the snubber to be inoperable.

2. Section 5.3.8 c) "Functional Tests"

   - The surveillance interval was more clearly defined in terms of months instead of refueling shutdown, and the implementation schedule of the revised and new requirements was clearly stated.