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September 30, 1986
ST-HL-AE-1769
File No.:G9.18/G36.04

Mr. Vincent S. Noonan, Project Director
PWR Project Directorate #5
U. S. Nuclear Regulatory Commission
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Revised Page for the Response
To Safety Evaluation Report,
NUREG-0781 Open Item #2 -
Internal Missile Analysis

Reference: (1) HL&P letter to NRC, M. R. Wisenburg to V. S. Noonan, June 17, 1986, ST-HL-AE-1684

Dear Mr. Noonan:

The above reference transmitted annotated changes to the South Texas Project (STP) Final Safety Analysis Report (FSAR) Section 3.5 and responses to NRC Questions which provided the results of the internal missile analysis/evaluations for the STP. These changes were submitted in response to the Safety Evaluation Report (SER), NUREG-0781 open item number 2 (Table 1.1-4 of the SER).

Since the submittal of the referenced letter, we have found a change which was inadvertently omitted from the letter. Attached please find a change to FSAR Page 3.5-2 regarding the evaluation of temperature detectors installed in high energy piping.

Our previous conclusion that as a result of the analysis, no modifications to the plant design are required still remains valid.

If you should have any questions on this matter, please contact Mr. M. E. Powell at (713) 993-1328.

Very truly yours,

M. R. Wisenburg
Manager, Nuclear Licensing

MEP/bl

Attachment: Annotated changes to FSAR Page 3.5-2

L1\nrc\bl.

A001
1/1

cc:

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categories for safety related systems, structures and components

Table 3.5-2 lists and describes the barriers utilized for missile protection.

3.5.1.1 Internally Generated Missiles Outside the Containment. Seismic Category I structures, systems, and components outside the Containment whose failure could result in radiological consequences in excess of 10CFR100 guidelines or which are required for attaining and maintaining a safe shutdown during normal or accident conditions are listed in Table 3.5-1. External missile protection provisions and references to applicable system descriptions and drawings that demonstrate separation and independence are listed in Table 3.5-1. ~~Initial~~ internal missile protection ~~provisions~~ are indicated in Table 3.5-1. ~~Final internal missile design protection provisions, including as-built reconciliations, will be provided in Table 3.5-1 prior to fuel load.~~ Protection requirements from internal missile sources are described below for the following potential missile sources: 53

~~Potential sources of missiles are:~~

- High-pressure systems
- Rotating machinery
- Gravitational missiles
- compressed air/gas cylinders

Compressed air/gas cylinders are either separated from safety related components in cubicles or subcompartments within the structure, not located within the structures which house safety related systems or they are restrained. 2 36 Q211.1

Systems outside the Containment were reviewed to determine sources of missiles. The results of this review are discussed in the following section.

and tanks

3.5.1.1.1 High-Pressure Systems: Valve bonnets and stems, ~~and~~ thermowells are the potential missiles associated with high-pressure systems outside the Containment. 36

Insert

(or high energy)

Temperature or other detectors installed on piping or in wells are evaluated as potential missiles if a failure of a single circumferential weld would cause their ejection. This is highly improbable, since a complete and sudden failure of a circumferential weld is needed for a detector to become a missile. In addition, because of the spatial separation of redundant safety-related equipment, a small missile such as a detector, assuming the circumferential weld fails completely, is not likely to hit redundant safety-related equipment. 36

Two types of valve components, valve stems and valve bonnets, are potential missiles. Valves in high-pressure systems have been reviewed as potential missile sources. The provisions that valves have bolted bonnets or secondary retention devices, and that they be designed to ASME III requirements effectively eliminates credible sources of valve component missiles.

Valves of ANSI 900 psig rating and above, constructed in accordance with Section III of the ASME Boiler and Pressure Vessel Code, are pressure seal bonnet type valves. For pressure seal bonnet valves, valve bonnets are prevented from becoming missiles by the retaining ring, which would have to fail in shear, and by the yoke, which would capture the bonnet or reduce bonnet energy. 36

Because of the highly conservative design of the retaining ring of these valves (safety factors in excess of 8 may be used), bonnet ejection is highly improbable and hence bonnets are not considered credible missiles.

Most valves of ANSI rating 600 psig and below are valves with bolted bonnets. Valve bonnets are prevented from becoming missiles by limiting stresses in the

Insert for Page 3.5-2/Section 3.5.1.1.1

...where they are only attached by a threaded connection. Where they are attached by a threaded connection with a seal weld, the seal weld prevents the connection from disengaging because of vibration, cyclical stresses etc. and these detectors are not postulated as missiles. Where they are attached by welding, the design strength of the completed weld is at least equal to or greater than the base materials and therefore, these detectors are not postulated as missiles.