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I-CC ANP-95
7/18/85

Houston Lighting & Power Company # 0015021

OFFICE MEMORANDUM

April 27, 1981.

ST-HL-18928

SFN: V-0530

To: L. R. Jacobl

From: M. E. Powell *MEP*

Subject: Incident Review Committee (IRC) Meeting Concerning the Primary & Secondary Stress Intensity for Upset Loads in the Design of the Containment Mechanical Penetrations M9, M13 and M17; April 24, 1981 (Item #93)
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

During a Quadrex audit of the specification for containment mechanical penetration M9, M13 and M17, it was noted that the Primary and Secondary ($P_L + P_B + Q$) limit for Upset conditions were shown in the specification to be 3.3Sm. The 3.3 factor was questioned since, in general, this limit is typically 3.0Sm.

HL&P Engineering provided the following background as to why the 3.3 factor was incorporated into the subject specification:

For the 1974 Edition of ASME B&PV code, the limits of stress intensity are found in Appendix XIII and specifically Figure XIII-1141-1. From this figure the limit of stress intensity for ($P_L + P_B + Q$) is given as 3kSm. Table NC-3217-1 lists values of k that are appropriate for various load combinations. The k-factor for Upset loading condition is 1.1. The use of $k=1.1$ and 3kSm provide a limit of 3.3Sm from the 1974 Edition of the code.

Since, as a design limit, the k-factor should not in general be applied to secondary self-equilibrating loads, the Figure XIII-1141-1 in the 1977 edition of the code was modified to provide a limit of stress intensity for ($P_L + P_B + Q$) of only 3Sm.

Thus, the 3.3 factor was incorporated as a result of an error in the code.

HL&P Engineering further stated that the Vendor stress report for the subject penetrations had been reviewed and the Primary and Secondary ($P_L + P_B + Q$) limit for Upset conditions was actually lower than the 3.0Sm limit by a factor of 3. In addition, B&R is processing a change to the subject specification to reflect the code change in the 1977 Edition to provide a limit of 3.0Sm. This limit will be used in future Vendor stress analyses.

The IRC concluded that no significant safety hazard exists since no penetrations have been designed with stresses exceeding the 3Sm limit for Upset conditions. In general, the sizing of penetrations will be determined by the Faulted and Rupture loads using primary stress intensity limits (since the Upset loads are not limiting loads). The Secondary loads are self-equilibrating and if a stress intensity between 3Sm and 3.3Sm should have been evaluated only local yielding would have occurred in the structure not failure. Thus, this item is considered to be closed.

MEP/par

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NUCLEAR REGULATORY COMMISSION
Official Est. No. 57N50-49801
Serial No. 004N P#95
In the matter of 7/18/85
Staff ✓
Applicant ✓
Interviewer ✓
Joint S. Off. ✓
Contractor ✓
Client ✓
Reporter ✓
DATE 7/18/85
WITNESS ✓
RECEIVED ✓
REJECTED ✓
IDENTIFIED ✓

Houston Lighting & Power Company

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To

From

Subject

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