TEXAS UTILITIES GENERATING COMPANY
SKYWAY TOWER • 400 NORTH OLIVE STREET, L.B. 81 • DALLAS, TEXAS 75201

Log # TXX-4320
File # 10010
903.11
915.1

September 28, 1984

Director of Nuclear Reactor Regulation
Attention: Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 AND 50-446
IMPACT OF TEMPERATURE DUE TO MAIN
STEAM LINE BREAK OUTSIDE CONTAINMENT
ON EQUIPMENT THAT REQUIRES ENVIRONMENTAL
QUALIFICATION

Dear Sir:

References 1 and 2 (attached) identified a deficiency in the temperature envelope used to environmentally qualify equipment for High Energy Line Breaks (HELB's) outside containment. Reference 2 provided that justification would be provided, if needed, to allow fuel load. Attached is the justification required to allow fuel load and full power operation.

Respectfully,

John W. Beck

John W. Beck
Manager, Licensing

DRW/grr
Attachment

Distribution: Original plus 40 copies

A001
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TEXAS UTILITIES GENERATING COMPANY
SKYWAY TOWER • 400 NORTH OLIVE STREET, L.B. 81 • DALLAS, TEXAS 75201

BILLY R. CLEMENTS
VICE PRESIDENT, NUCLEAR OPERATIONS

July 2, 1984
TXX-4212

Mr. E.H. Johnson, Chief
Reactor Project Branch 1
U.S. Nuclear Regulatory Commission
Office of Inspection & Enforcement
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76012

Docket Nos.: 50-445
50-446

COMANCHE PEAK STEAM ELECTRIC STATION
IMPACT OF HELB TEMPERATURES ON
QUALIFIED EQUIPMENT OUTSIDE CONTAINMENT
QA FILE: CP-84-12, SDAR-136
FILE NO.: 10110

Dear Mr. Johnson,

On June 4, 1984 we verbally contacted your Mr. D. Hunnicutt of a deficiency regarding the temperature envelope requirements on the environmental qualification of equipment outside containment for high energy line breaks (HELB).

We are continuing our evaluation and anticipate completion by August 31, 1984.

Very truly yours,

Billy R. Clements

BRC/tlg

cc: NRC Region IV - (0 + 1 copy)

Director, Inspection & Enforcement (15 copies)
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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TEXAS UTILITIES GENERATING COMPANY
SKYWAY TOWER • 400 NORTH OLIVE STREET, L.B. 81 • DALLAS, TEXAS 75201

BILLY R. CLEMENTS
VICE PRESIDENT, NUCLEAR OPERATIONS

August 30, 1984
TXX-4293

Mr. E.H. Johnson, Chief
Reactor Project Branch 1
U.S. Nuclear Regulatory Commission
Office of Inspection & Enforcement
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76012

Docket Nos.: 50-445
50-446

COMANCHE PEAK STEAM ELECTRIC STATION
IMPACT OF HELB TEMPERATURES ON
QUALIFIED EQUIPMENT OUTSIDE CONTAINMENT
QA FILE: CP-84-12, SDAR-136
FILE NO.: 10110

Dear Mr. Johnson,

On June 4, 1984 we verbally contacted your Mr. D. Hunnicutt of a deficiency regarding the temperature envelope requirements on the environmental qualification of equipment outside containment for high energy line breaks (HELB). We have submitted an interim report, TXX-4212, dated July 2, 1984.

As a result of industry wide application of this unreviewed safety question, the Westinghouse Owners Group has developed a program to address the issue on a generic basis. The program has been presented to the NRC and is summarized in Westinghouse letter OG-133 which is available for your inspector's review at the CPSES Site.

The tentative schedule indicates completion in approximately twelve (12) months. We are currently reviewing the need to provide Justifications for Interim Operation (JIO) in order to preclude impacting fuel load. We will continue to monitor activities related to this issue and provide a status report by October 31, 1984.

Very truly yours,

Billy R Clements

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BRC/tlg

cc: NRC Region IV - (0 + 1 copy)

Director, Inspection & Enforcement (15 copies)
U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTACHMENT TO TXX-4320

In June 1984, various utilities were informed by Westinghouse that there existed an unreviewed safety question concerning an increase in the energy release rate resulting from a main steam line break. This phenomenon results from a superheating of the steam in the steam generator after the tube bundle becomes uncovered. This increased energy release rate will generally cause an increase in the severity of the environmental conditions in the areas affected by a main steam line break.

At CPSES, the areas affected by the main steam line break are in the steam and feedwater piping penetration areas. The penetration areas are isolated from the remainder of the plant and the piping is then routed outside the safeguards building to the turbine deck. CPSES is required by Q010.20, to evaluate the environmental effects of a 1.0 ft^2 non-mechanistic crack in a main steam pipe between the moment restraint and the containment wall. The new energy release rates require that the environmental analysis for this area be redone.

The environmental analysis was redone using representative mass and energy release data for four loop plants. The data were supplied by Westinghouse. These data were conservatively determined and incorporate the superheat concern. The subcompartment environmental analysis model previously used was rerun using the new input data. A range of break sizes (1.0, 0.5 and 0.1 square feet) were run to investigate the effects of the new blowdown on the peak environmental conditions. It was determined that the 1.0 ft^2 break still yielded the most severe transient.

The new mass and energy release rates are nearly identical to what was used in the previous analysis up to the point where the superheat effects start to appear. The time necessary for the superheat effects to appear is dependent on the break size and this is why the range of break sizes was investigated.

The steam line break scenario for the 1.0 ft^2 break is as follows:

1) break
2) reactor trip
3) feedwater isolation
4) safety injection
5) steamline isolation
6) superheat effects appear

For this scenario, all safety functions i.e., trip and isolation signals, occur before the superheat effects appear.

In addition to the original analytical model, the effects of the fire protection sprinklers were taken into account. The previous analysis was conservative in that it did not include the sprinkler effects. The sprinkler system acts to cool the environment. Because the sprinkler system will actuate before the superheat effects appear, the qualification envelopes from the previous analysis are not exceeded except in the compartment with the break. In this break volume, there is a new temperature peak of 375^{o} for a duration of about 40 seconds above the original envelope. This occurs after sprinkler activation and is because the steam flow is large enough to partially offset the quenching effects of the sprays. This is acceptable because it is postulated that all equipment in the break room is rendered inoperable.

The inoperability of this equipment will allow the affected steam generator to blow dry, which has been analyzed in Chapter 15 of the CPSES FSAR. The equipment in the remaining rooms was reviewed to insure that they were not adversely affected by the failure of any equipment in the break volume. The only adverse effect of real concern was the potential failure of the MSIVs associated with the unaffected steam lines due to the failure of class 1E cables in the break volume. An evaluation was performed by examining the applicable electrical drawings and cable and raceway schedules. The result of that evaluation was that proper cable routing and circuit protection is provided to assure the operability of the MSIVs in the unfaulted steam lines.

In summary, the new analysis shows that previous environmental qualification efforts are still valid. Taking credit for the sprays keeps the temperatures in the unaffected compartments within the original qualification envelope (maximum temperature 325°F, peak pressure below 24.0 psia). Equipment within the affected compartment performs all required functions before the superheat effects are felt and can fail later without affecting the ability to mitigate the break and safely shutdown. Therefore the change in the energy release rate, as provided by Westinghouse poses no safety concern for the CPSES.