

Log # TXX-92486
File # 916 (3/4.3)
10010
Ref. # 10CFR50.90
10CFR50.36

William J. Cahill, Jr.
Group Vice President

November 10, 1992

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)- UNIT 1
DOCKET NOS. 50-445
SUBMITTAL OF LICENSE AMENDMENT REQUEST 92-08
ELIMINATION OF THE REQUIREMENT TO DISASSEMBLE AND
SURFACE INSPECT LOW PRESSURE TURBINE VALVES

Gentlemen:

Pursuant to 10CFR50.90, TU Electric hereby requests an amendment to the CPSES Unit 1 Operating License (NFP-87) by incorporating the attached proposed change into the CPSES Unit 1 Technical Specifications.

The proposed change revises the CPSES Unit 1 Technical Specifications by removing the 40 month surveillance requirement to disassemble and surface inspect the low pressure turbine stop and control valves. Attachment 2 provides a detailed description of the proposed change, a safety analysis of the change, and TU Electric's determination that the proposed change does not involve a significant hazards consideration. Attachment 3 provides the affected Technical Specification pages (NUREG-1399), marked-up to reflect the proposed change.

Since compliance with this surveillance would require its implementation during Refueling Outage 3 for CPSES Unit 1, TU Electric requests NRC review and approval of this change no later than June 30, 1993. TU Electric requests that approval transmittal for this proposed amendment include a 30 day implementation period following the date of issuance.

130065

9211160378 921110
PDR ADOCK 05000445
P PDR

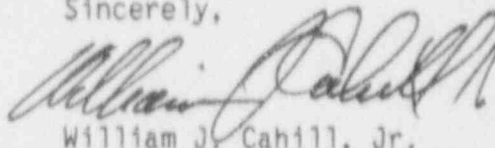
30 N. Olive Street L.B. 81 Dallas, Texas 75201

DO29 1/1

In accordance with 10CFR50.91(b), TU Electric is providing the State of Texas with a copy of this proposed amendment.

Should you have any questions, please contact Mr. Bob Dacko at (214) 812-8228.

Sincerely,



William J. Cahill, Jr.

BSD/bsd

Attachments: 1. Affidavit
2. Description and Assessment
3. Affected Technical Specification pages (NUREG-1399)

Enclosures 1. Standard Review Plan, NUREG-75/087, Section 10.2
2. Siemens letter to Mr. R. T. Jenkins from Mr. P. C. Hosbein dated February 14, 1992
3. Utility Power Corporation (now Siemens) letter to Mr. J. J. Kelley from Mr. P. C. Hosbein dated January 23, 1990
4. Allis-Chalmers Power Systems, Inc. (ACPSI, now Seimens) Engineering Report No. ER-504, PROBABILITY OF TURBINE MISSILES from 1800 r/min Nuclear Steam Turbine-Generators with 44-inch Last Stage Blades October 1975
5. Supplement 6 to NUREG 0797, Safety Evaluation Report related to operation of CPSES Units 1 and 2, November 1984 Table 10.1 (page 10-9)
6. Federal Register Vol. 51, No. 44, Rules and Regulations, March 6, 1986, page 7751

c - Mr. J. L. Milhoan, Region IV
Mr. B. E. Holian, NRR
Mr. T. A. Bergman, NRR
Resident Inspectors, CPSES (2)

Mr. D. K. Lacker
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78704

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

Texas Utilities Electric Company

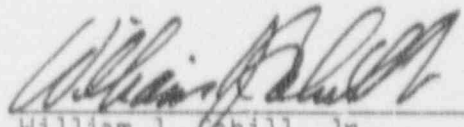
(Comanche Peak Steam Electric
Station, Unit 1)

Docket Nos. 50-445

License No. NFP-87

AFFIDAVIT

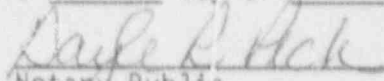
William J. Cahill, Jr. being duly sworn, hereby deposes and says that he is Group Vice President, Nuclear of TU Electric, the lead Applicant herein; that he is duly authorized to sign and file with the Nuclear Regulatory Commission License Amendment Request 92-08; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.



William J. Cahill, Jr.
Group Vice President, Nuclear

STATE OF TEXAS)
COUNTY OF DALLAS)

Subscribed and sworn to before me, on this 10th day of November _____.



Notary Public

DESCRIPTION AND ASSESSMENT

I. BACKGROUND

The current CPSES surveillance requirement 4.3.4.2d for Technical Specification 3/4.3.4, "Turbine Overspeed Protection", requires that the overspeed protection system shall be demonstrated operable "At least once per 40 months by disassembling at least one of each of the above (turbine) valves and performing a visual and surface inspection of valve seats (if applicable), disks, and stems and verifying no unacceptable flaws".

The basis for Technical Specification 3/4.3.4, "Turbine Overspeed Protection", is to help prevent turbine missiles. The purpose of this inspection is to confirm that no unacceptable flaws have been introduced into the valves which could preclude the valve from performing its intended function, (i.e., to shut and prevent the turbine from reaching destructive overspeed and presenting a missile hazard).

Surveillance 4.3.4.2d currently affects both High Pressure (HP) stop and control valves and Low Pressure (LP) stop and control valves. However, design differences between HP and LP stop and control valves makes the disassembly and surface examination of the LP valves impractical. Each HP stop and control valve has a stem, disk and a seat. The valves are designed such that they can be removed from the lines and disassembled for the required inspection. The LP stop and control valves are butterfly valves (the primary components are the flapper and the shaft), and are welded into the hot reheat steam pipe making disassembly and inspection extremely difficult.

Each LP flapper is a casting which is fabricated in one piece from 18CrMo910 steel. The flapper rotates within the pipe 90° to an open or closed position. The flapper does not make metal to metal contact in the closed position. There is a nominal 2mm gap between the edge of the flapper and the inside pipe wall. There is no seat in the butterfly valve. A surface crack examination of the flapper is conducted in the shop. Since this is a casting, an MT is performed. A hardness test is also performed in the shop.

The shaft is made from a solid piece of bar stock material type 21CrMoNiV47, a highly corrosion resistant material. The shaft is inserted through the flapper and secured with 6 locking pins. The valve is assembled at the factory and the shaft has never been removed for any reason at any operating plant (Reference 3).

The 48" pipe that surrounds the flapper is carbon steel material. The welds in the hot reheat elbows were RT inspected during construction.

The quality of the valves, as of January 1990, has been established based on the initial manufactured condition and the lack of operational history or other conditions which could cause flaws to be introduced into the valve components. There were essentially no stress related events occurring to the turbine valves up to that time (thermally induced, or operation under load).

II. DESCRIPTION OF TECHNICAL SPECIFICATION CHANGE REQUEST

This request proposes to revise the surveillance requirement 4.3.4.2d for the Technical Specification entitled "Turbine Overspeed Protection" in the Comanche Peak Steam Electric Station (CPSES) Unit 1 Technical Specifications (NUREG-1399, Reference 1). The change replaces the requirement to disassemble one LP stop valve and one LP control valve and perform a visual and surface inspection, with a requirement to perform a visual inspection of the disk and accessible portions of the shaft. This change does not change the requirements for the HP stop and control valves.

III. ANALYSIS

The existing surveillance appears to be taken directly from the original Standard Review Plan (SRP), NUREG-75/087 (Reference 2). Although the specific basis for this surveillance is not specifically stated, it is presumed that it is based on historical failure rates for these valves prior to the initial issuance of the SRP (primarily fossil plants and early nuclear plants). In this time frame, most of the power plants utilized phosphate chemistry and were subject to particulate carryover. Collection of particulate carryover and corrosion products (especially caustic products), in valve crevices such as disk to shaft interfaces created a potential for caustic stress corrosion/cracking. In addition, some plants used an LP valve design incorporating a valve seat which caused metal to metal contact, subjecting the valve components to higher stresses. This surveillance (especially the disassembly and surface examination) is capable of detecting such cracks.

Since the advent of all-volatile chemistry treatment (such as used at CPSES), particulate carryover and subsequent caustic corrosion of valve components has been significantly reduced. Also, the LP valve butterfly design does not have a seat (there is a nominal 2mm gap between the flapper and the inside pipe wall) so that there are no stresses associated with disk to seat contact during valve closure. In fact, Siemens has 32 nuclear plants around the world all using LP butterfly valves of similar construction to that at CPSES and in over 18 years no failures have been recorded. Siemens recommends only a visual inspection of the accessible portions of these valves (with steam seals and bearings removed). If any unacceptable flaws are found during this examination, further testing would be recommended. Siemens believes that disassembly and surface inspection of the valves is not warranted and does not provide any significant improvement in the reliability of the overspeed protection system. Further, as a result of the good performance and design of the Low Pressure stop and control valves, Siemens does not anticipate changing the extent of visual examinations in the future (References 3 and 4).

CPSES has turbine generator units supplied by Allis-Chalmers Power Systems, Inc. (ACPSI). ACPSI was subsequently renamed Utility Power Corporation (UPC) and later renamed Siemens. In ACPSI Engineering Report No. ER-504 (Reference 5), Siemens calculated the probability of turbine missiles. This report took credit for periodic inspections and testing of turbine components, including the LP stop and control valves. The report did not take credit for disassembly and surface inspection of the turbine LP valves and thus the removal of this portion of the surveillance will not have any impact on the calculated probability of generating turbine missiles.

Although not physically impossible, the disassembly of the LP stop and control valves would be extremely difficult and has the potential to damage the valve. As previously described, these valves are welded in place and cannot be removed. Disassembly would require entry into the 48" reheat piping and constructing scaffolding inside the pipe to support the flapper in place. With the flapper immobilized, the shaft could then be removed. The flapper surface examination would have to be conducted from within the pipe. Since the in-place disassembly procedure has never been conducted for any Siemens turbine, there is significant potential for valve damage during the shaft removal and reinstallation, as well as personnel hazard due to the weight of the flapper, the confined conditions inside the reheat pipe and the lack of support surfaces for erection of scaffolding.

In summary, not only is the disassembly and surface inspection of the LP stop and control valves unnecessary to adequately prevent turbine missiles, but the disassembly is a personnel safety hazard and has the potential to damage the valve.

IV. SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TU Electric has evaluated whether or not a significant hazard consideration is involved with the proposed changes by focusing on the three standards set forth in 10CFR50.92(c) as discussed below:

Does the proposed change:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated?

Surveillance 4.3.4.2d monitors the integrity of the seats, disks and stems of the turbine valves. Turbine overspeed is limited by rapid closure of the turbine control or stop valves whenever turbine power exceeds generator output. Should a destructive turbine overspeed occur, the resulting accident is the generation of turbine missiles from burst type failure of the low pressure blades and/or disks.

The NRC has provided guidance to limit the maximum probability of generating turbine missiles (Reference 6). For favorably oriented turbines, such as CPSES, the acceptance criterion for the generation of turbine missiles, is a probability of less than 10^{-4} per year. In Engineering Report No. ER-504, Siemens calculated the probability of turbine missiles to be 2.1×10^{-7} , which is significantly below the NRC acceptance criterion. The report did not take credit for disassembly and surface inspection of the turbine LP valves and thus the removal of this portion of the surveillance will not have any impact on the calculated probability of generating turbine missiles. The potential benefit from the disassembly and surface inspection of the LP stop and control valves is small and could easily be overcome by the potential for valve damage. Thus this change does not significantly increase the probability of an accident previously evaluated.

FSAR Section 3.5.1.3 evaluated turbine missiles including an analysis of the worst postulated turbine missile. The acceptability of this analysis is based on the low probability of a turbine missile and the low potential for damage from a postulated missile. This change has no impact on the potential damage from a postulated missile, and since there is no significant impact on the probability of a turbine overspeed event, this change does not increase the consequences of any accident previously evaluated.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed amendment eliminates the disassembly and surface inspection of the low pressure turbine stop and control valves. The only potential accident associated with this change is the generation of turbine missiles. Turbine missile accidents have been previously analyzed in FSAR Section 3.5.1.3. This change will not affect the failure modes for the turbine valves. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from an accident previously evaluated.

3. Involve a significant reduction in a margin of safety?

A revision to CPSES surveillance requirement 4.3.4.2d for technical specification 3/4.3.4, "Turbine Overspeed Protection", to eliminate the disassembly and surface inspection of the low pressure stop and control valves does not involve a significant reduction in a margin of safety since the safety analyses in the CPSES FSAR are essentially unaffected and safety limits are not exceeded.

The Nuclear Regulatory Commission has provided guidance concerning the application of the standards for determining whether a significant hazards consideration exists by providing certain examples (51 FR 7751, Reference 7) of amendments that are considered not likely to involve significant hazards consideration. Example (vi) relates to a change which may have some increase to the probability or consequences of previously reviewed accidents or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptance criteria with respect to the system or component as specified in the Standard Review Plan.

The proposed change to eliminate the surface inspection of the LP stop and control valves and the accompanying changes to the Technical Specification surveillance requirements described above, are similar to example (vi) in that there could be minor increases in the probability of some previously analyzed accidents; however, the results of the change clearly continue to maintain the probability of the turbine missile generation well within the NRC acceptance criterion of 10^{-4} .

Based on the above evaluations, TU Electric concludes that the activities associated with the above described change presents no significant hazards consideration under the standards set out in 10CFR50.92(c) and, accordingly, a finding by the NRC of no significant hazards consideration is justified.

V. ENVIRONMENTAL EVALUATION

TU Electric has evaluated the proposed change and has determined that the change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion of categorical exclusion set forth in 10CFR51.22(c). Therefore, pursuant to 10CFR51.22(b), an environmental assessment of the proposed changes is not required.

VI. REFERENCES

1. NUREG-1399, "Technical Specifications, CPSES Unit No. 1", April 1990.
2. Standard Review Plan, NUREG-75/087, Section 10.2
3. Siemens letter to Mr. R. T. Jenkins from Mr. P. C. Hosbein dated February 14, 1992
4. Utility Power Corporation (now Siemens) letter to Mr. J. J. Kelley from Mr. P. C. Hosbein dated January 23, 1990
5. Allis-Chalmers Power Systems, Inc. (ACPSI, now Seimens) Engineering Report No. ER-504, PROBABILITY OF TURBINE MISSILES from 1800 r/min Nuclear Steam Turbine-Generators with 44-inch Last Stage Blades October 1975
6. Supplement 6 to NUREG 0797, Safety Evaluation Report related to operation of CPSES Units 1 and 2, November 1984 Table 10.1 (page 10-9)
7. Federal Register Vol. 51, No. 44, Rules and Regulations, March 6, 1986, page 7751