

TUELECTRIC

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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 92-07
TURBINE VALVE TEST FREQUENCY REDUCTION

Gentlemen:

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

The proposed change revises the CPSES Unit 1 Technical Specifications by reducing the frequency of turbine valve testing from every 14 days to every six weeks, and by reducing the frequency of the direct observation of the operation of those valves from every 31 days to every six weeks. 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.

TU Electric requests that the approval transmittal for this proposed amendment include a 30 day implementation period following the date of issuance.

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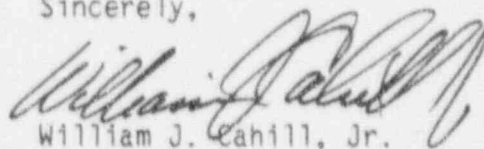
400 N. Olive Street L.B. 81 Dallas, Texas 75201

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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 page (NUREG-1399)

Enclosures: 1. NUREG 1366 (Draft) Section 5.13, pages 33, 34 and 35
2. Siemens letter from Mr. P. C. Hosbein to Mr. C. L. Terry, dated June 11, 1992 (including Figure 1)
3. Allis-Chalmers Powers Systems, Inc.
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
4. 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)
5. 10CFR 7751, "Federal Register Vol. 51, No. 44, Rules and Regulations", March 6, 1986, page 7751
6. NRC Safety Evaluation of Point Beach Nuclear Plant, Units 1 & 2 application for License Amendment related to Turbine Valve Test Frequency Reduction
7. NRC Safety Evaluation of Prairie Island Nuclear Plant, Units 1 & 2 application for License Amendment related to Turbine Valve Test Frequency Reduction

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

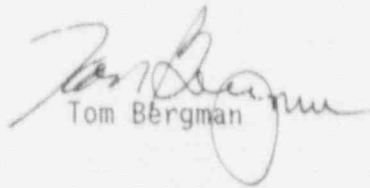
December 1, 1992

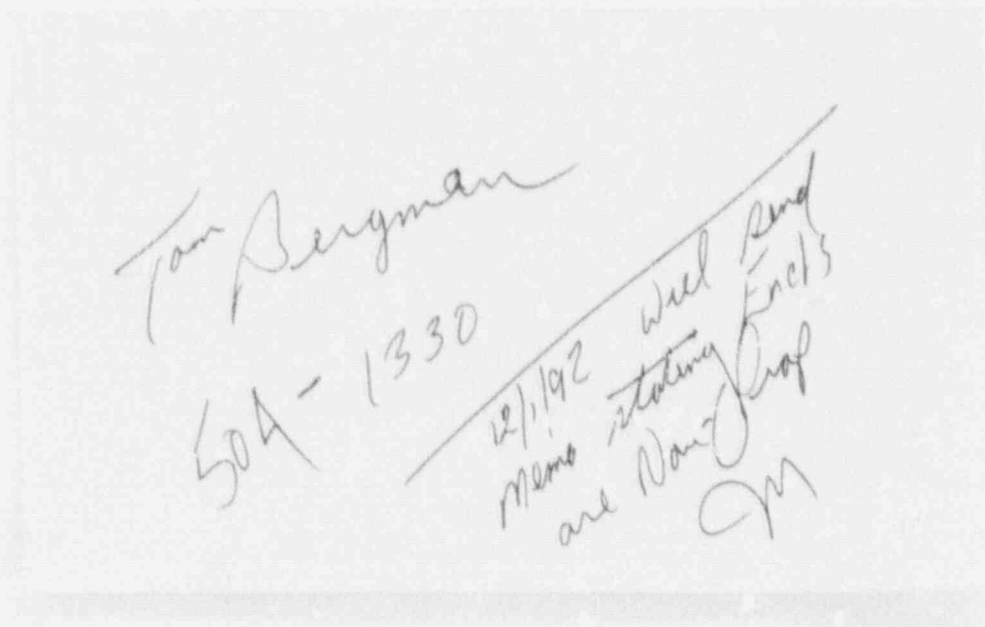
MEMO TO: J. MCKNIGHT

FROM: T. BERGMAN

SUBJECT: TU ELECTRIC LETTER DATED NOVEMBER 11, 1992, "SUBMITTAL OF LICENSE
AMENDMENT REQUEST 92-07 TURBINE VALVE TEST FREQUENCY REDUCTION"

You noted that the subject letter had Allis-Chalmer drawings marked
proprietary. I discussed this letter with the licensee (D. Woodlan), who
stated that the drawings within the submittal were not proprietary.


Tom Bergman


Tom Bergman
504-1330
12/1/92 Will send
memo stating Encl's
are Non-Prop
Jm

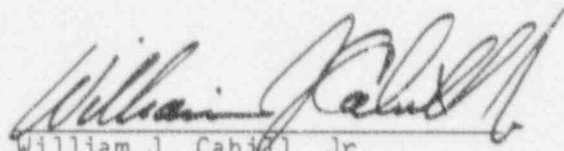
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of
Texas Utilities Electric Company
(Cumanche Peak Steam Electric
Station, Unit 1)

Docket Nos. 50-445
Licen' No. NFP-87

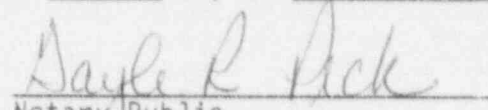
AFFIDAVIT

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 92-07; 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 4.3.4.2a for Technical Specification 3/4.3.4, "Turbine Overspeed Protection", requires cycling each high and low pressure turbine stop and control valve once per 14 days using the manual test or Automatic Turbine Tester. Surveillance 4.3.4.2c requires direct observation of the movement of the above turbine valves through one complete cycle once per 31 days.

The surveillance testing requires moving each of the turbine valves through one complete cycle and is typically performed by a control room operator with an observer at the valve. The test verifies freedom of movement of the valve components and is beneficial in detecting problems with valve operation and identification of gross outward appearance of valve condition. The surveillance requirement ensures that all turbine steam inlet valves are capable of closing to protect the turbine from excessive overspeed which could generate potentially damaging turbine missiles.

Turbine valve testing is considered a high risk surveillance. In draft NUREG 1366 (Reference 1), the NRC evaluated several proposed improvements to technical specification surveillances. In particular, the NUREG identified the above turbine valve testing surveillances as requiring "faster action" by the NRC based on the following concerns:

1. The surveillance causes a significant number of reactor trips.
2. The surveillance results in some wear to the valves and stress to the steam system, in some cases causing relief valves to lift.
3. When the test is conducted, in order to avoid a reactor trip the steam flow to the turbine must be reduced. This is done by reducing reactor power which results in a reduction in capacity factor. In addition, because of the reduction in power, the test becomes more difficult to perform at the end of cycle when there may not be enough boron dilution to override Xenon.

To minimize these negative effects while assuring proper protection against overspeed, TU Electric approached Siemens to determine if a longer surveillance test interval would be appropriate. Siemens, the manufacturer of the CPSES turbines has recommended a one month testing interval, or a six week testing interval providing, that additional monitoring sensors are installed on each stop valve, and that no degradation of closing time is observed. This recommendation was based on a quantitative evaluation performed by Siemens (Reference 2) of the probability of failure of the overspeed trip and protection system as a function of the turbine stop and control valve test interval.

CPSES will install the additional monitoring sensors. These sensors monitor valve closing time which can be trended to detect valve degradation as input to scheduled maintenance during refueling outages.

II. DESCRIPTION OF TECHNICAL SPECIFICATION CHANGE REQUEST

This request proposes to revise the surveillance requirements 4.3.4.2a, and 4.3.4.2c for the Technical Specification entitled "Turbine Overspeed Protection" in the Comanche Peak Steam Electric Station (CPSES) Unit 1 Technical Specifications (NUREG-1399, Reference 3). Surveillance 4.3.4.2a is revised to require cycling each high and low pressure turbine stop and control valve once every six weeks using the manual test or automatic turbine tester. Also, Surveillance 4.3.4.2c is revised to require direct observation of the movement of the above turbine valves through one complete cycle once every six weeks.

III. ANALYSIS

The present requirements for the test frequency are based on historical turbine vendor recommendations. The test interval was developed for fossil units and carried over to nuclear units due to the similarity of design. Fossil units (and early PWR units) utilized phosphate chemistry in their condensate. This contributed to a much greater particulate content than is permitted in current nuclear units and higher incidence of valve inoperability due to phosphate carryover. With the use of all volatile chemistry, such as used at CPSES, the failures attributed to particulate carryover have been significantly reduced.

It was the conclusion of draft NUREG-1366, that with the manufacturers recommendation, the test interval for turbine valves as part of the turbine overprotection system surveillances should be extended to one test quarterly, with direct observation of each turbine valve movement. The NUREG also noted that a quarterly test corresponds to the most stringent valve testing requirement of the ASME Code (for safety related valves). The proposed surveillance revision is more stringent than the recommendations of draft NUREG 1366.

In Allis-Chalmers Power Systems, Inc. (APCSI, now Siemens) Engineering Report No. ER-504, "Probability of Turbine Missiles" (Reference 4), using a two week testing interval, and historical failure rate data gathered through January 1, 1975, the failure probabilities of the turbine HP/LP stop and control valves were calculated to be 3.93×10^{-6} and 8.53×10^{-6} per year respectively. Based in part on the above, the overall turbine missile probability was calculated to be approximately 2.1×10^{-7} per year. Subsequently, Siemens updated the failure rate

data for Siemens turbine stop and control valves. The updated failure probability for these valves decreased to 6×10^{-7} per year. Based on the curve of valve failure probability versus testing interval (Figure 1), increasing the test interval to six weeks would not increase the failure rate of these valves to a level as high as that assumed in ER-504. Thus, the requested six week test interval would not increase the calculated missile generation probability.

In addition, installation of additional monitoring sensors will detect valve closing time degradation thus improving the capability for early detection of valve problems.

IV. SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TU Electric has evaluated whether or not a significant hazards 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?

Surveillances 4.3.4.2a and 4.3.4.2c monitor the performance of each high and low pressure turbine stop and control valve. Turbine overspeed is limited by rapid closure of the turbine control and stop valves. Turbine overspeed can result in the occurrence of turbine missiles from a burst type failure of the low pressure blades 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. ER-504, "Probability of Turbine Missiles", calculates the overall turbine missile probability to be approximately 2.1×10^{-7} per year based, in part, on the failure probability of the HP/LP stop and control valves of 3.93×10^{-6} and 8.53×10^{-6} per year respectively. The CPSES turbine missile probability is significantly lower than that required by the NRC guidance. Subsequently, Siemens updated the failure rate data for Siemens turbine stop and control valves. The updated failure probability for these valves decreased to 6×10^{-7} per year. Based on figure 1 (valve failure probability versus testing interval), increasing the test interval to six weeks would not increase the failure rate of these valves to a level as high as that assumed in ER-504. Thus, the requested six week test interval would not increase the calculated missile generation probability.

Based on APCS Report No. ER-504, and the updated stop and control valve failure probability, it is concluded that the implementation of this technical specification revision will not increase the probability or consequences of an accident previously analyzed. The revision of the surveillance results in a net improvement in plant safety by reducing the likelihood of plant trips and stress and wear on plant components based on the concerns evaluated in draft NUREG 1366.

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

Turbine overspeed with the resulting turbine missiles is the only accident potentially affected by failure of the turbine stop and control valves. The turbine missile analysis is not altered by reducing the frequency of high and low pressure stop and control valve testing. As can be seen from Figure 1, reducing the frequency of turbine valve testing from every 2 weeks to every 6 weeks does not result in a significant change in the failure rate, nor does it 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 any accident previously evaluated.

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

A revision to CPSES surveillance requirements 4.3.4.2a and 4.3.4.2c to reduce turbine valve test frequency 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 possible impacts to safety are due to slower valve closing time. Since additional monitoring sensors are being installed on each valve, degradation of closing time of the stop valves will be detected.

The probability of generating turbine missiles, as noted in APCS Report ER-504, remains unchanged. Thus this change to the Comanche Peak Technical Specification will not result in a significant reduction in the margin of safety for turbine missile ejection. The probability of missile ejection remains acceptably small and well within guidelines established by the NPC staff.

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 2) 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 acceptable criteria with respect to the system or component as specified in the Standard Review Plan.

The proposed reduction in frequency of turbine valve test 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 maintain the probability of the turbine missile generation within the NRC acceptance criterion of 10^{-4} per year. It is more likely that the change will enhance performance since the additional monitoring sensors will improve detectability of valve degradation.

Based on the above evaluations, TU Electric concludes that the activities associated with the above described changes present 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 changes and has determined that the changes do 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 individual or cumulative occupational radiation exposure. Accordingly, the proposed changes meet the eligibility criterion for 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 1366 (draft)
2. Siemens letter dated June 11, 1992 to C. L. Terry from P. Hosbein
3. NUREG 1399, "Technical Specifications, CPSES Unit No 1", April 1990.
4. Allis-Chalmers Powers Systems Inc., (now Siemens)
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
6. 51 FR 7751, "Federal Register Vol. 51, No. 44, Rules and
Regulations", March 6, 1986.
7. NRC Safety Evaluation of Point Beach Nuclear Plant, Units 1 & 2
application for License Amendment related to Turbine Valve Test
Frequency Reduction
8. NRC Safety Evaluation of Prairie Island Nuclear Plant, Units 1 & 2
application for License Amendment related to Turbine Valve Test
Frequency Reduction

VII. Precedents

The NRC has granted similar increases in the test interval to Point Beach Units 1 & 2 (Reference 6) and to Prairie Island Units 1 & 2 (Reference 7). For these plants the increase was from a monthly interval to an interval not to exceed one year.