

TEXAS UTILITIES SERVICES INC.

2001 BRYAN TOWER DALLAS, TEXAS 75201-3050

Log # TXX-4008

File # 910.2

July 18, 1983

Mr. Harold R. Denton
Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 AND 50-446
L.P. TURBINE DISC LICENSING CONDITION

Dear Mr. Denton:

Supplement 3 Comanche Peak Steam Electric Station Safety Evaluation Report (NUREG-0797), includes as a licensing condition the requirement that the bore and keyways of the low-pressure turbine discs must be inspected ultrasonically during the first refueling outage. The NRC staff imposed this requirement in part because: 1) the CPSES low pressure turbine discs were constructed of steel with above average yield strength; 2) several cases of disc cracking have been reported involving KWU low pressure turbines in fossil plants; and, 3) without complete information concerning the CPSES turbines the staff has conservatively assumed the same propensity for disc cracking exhibited by Westinghouse turbines.

Texas Utilities transmitted the FSAR response to Q124.1 on May 1, 1981 and supplementary technical data contained in Engineering Report ER-8102 was transmitted on September 15, 1981. Additional reviews and analyses since those transmittals have re-enforced our original conviction that the imposition of the licensing condition is unnecessary and should be deleted. The following are the bases of our conviction:

1. SER Supplement 1, Section 3.5.1.3 concludes that there is no safety concern associated with turbine generated missiles. This conclusion was extremely conservative in that the value for the destruct overspeed probability used in the analysis was imposed by the NRC. The KWU supplied probability was more than a factor of 100 smaller.
2. The design of the KWU Low-Pressure turbine discs are significantly different from those of Westinghouse and General Electric design. For example, the KWU turbine discs have a forged cylindrical groove positioned to reduce stress risers at the disc keyway (See attachment 1).

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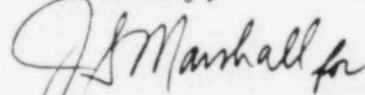
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3. Following the Hinkley Point turbine failure in 1974, KWU performed inspections on 176 LP turbine discs selected from a population of 1353 South African and European turbine discs (including 45 nuclear turbine discs). None of the nuclear turbine discs examined revealed any cracking. Cracks were found only in the South African turbine discs utilized in high speed, non-reheat, fossil-fired service. The high speed (3000 to 3600 RPM) application of disc type rotors is now considered obsolete. All KWU nuclear disc type turbines are low speed (1500 to 1800 RPM). (See attachment 2 for further details.)
4. Data accumulated from eight KWU turbines utilized in European nuclear power plants, some since 1975, show no indication of any stress corrosion cracking in LP discs. (See attachment 3 for further details).
5. The susceptibility of an LP turbine disc to stress corrosion cracking relates not only to material yield strength, but also to steam/water chemistry conditions. The South African units where disc cracking was observed had significantly different water chemistry conditions from European units where no cracking was observed. (See attachment 2 for further details.) CPSES has developed a water chemistry control program utilizing all volatile treatment (AVT) in accordance with the requirements of technical specification 6.8.4c and the recommendations of KWU. A copy of this program has been entered into the CPSES docket and is available for NRC review.
6. CPSES will perform an in-service inspection of each LP turbine once each five-years. This inspection includes a visual and surface examination of the accessible portions of the LP turbine disc. KWU has found this program to be in accordance with their recommended practices.

In summary, there is no evidence to support the NRC staff's safety concern with regard to KWU LP turbine disc cracking at CPSES and, hence, no basis for this licensing condition. It is the Texas Utilities position that the recommended licensing condition be deleted in the next SER supplement.

Should you require further information, please contact this office.

Sincerely,

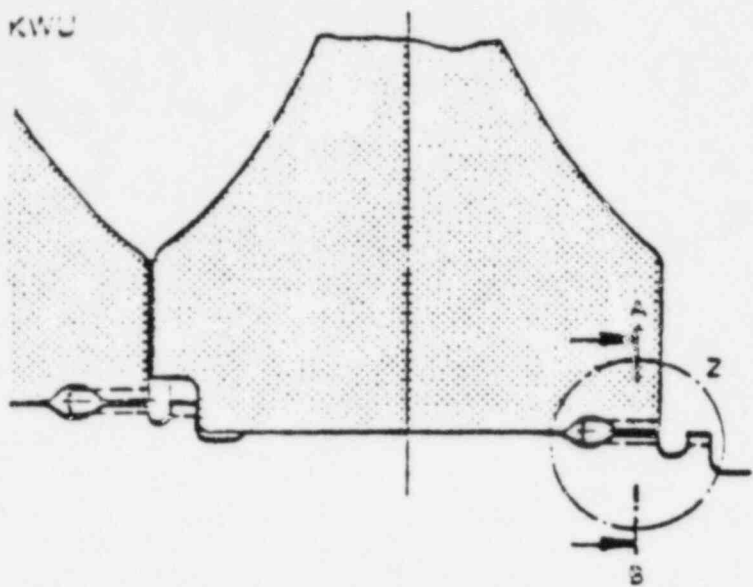

H. C. Schmidt

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Attachments

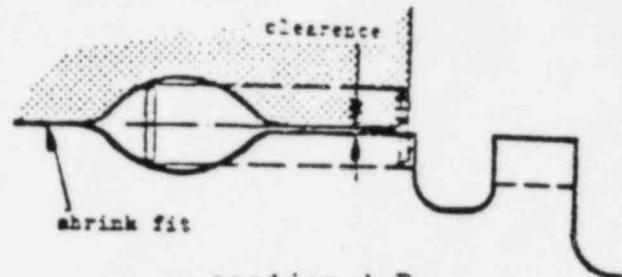


ATTACHMENT 1

KWU



detail Z

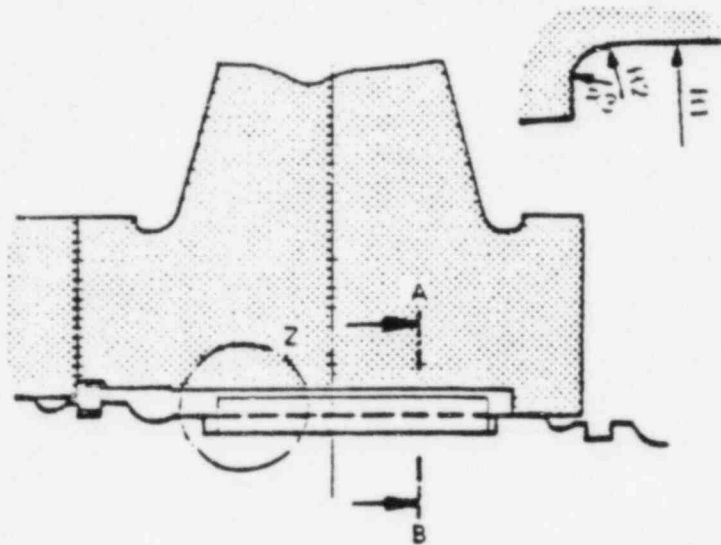


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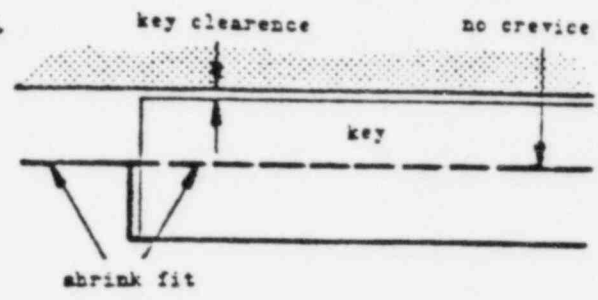


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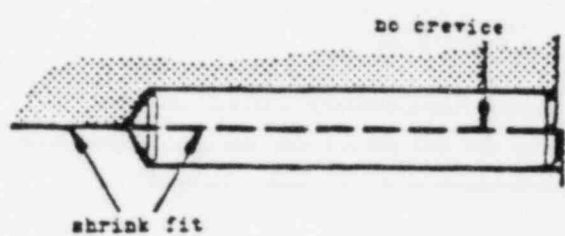
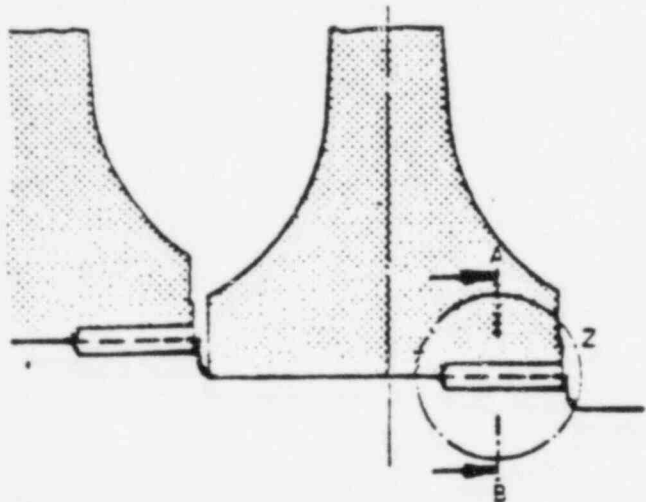


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detail Z



section A-B



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