



Log # TXX-88129  
File # 10110  
903.9  
Ref. # 10CFR50.55(e)

January 29, 1988

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Executive Vice President

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION  
DOCKET NOS. 50-445 AND 50-446  
FLEXIBLE METAL TUBING MISALIGNMENT  
SDAR: CP-87-114 (FINAL REPORT)

Gentlemen:

On October 21, 1987, we verbally notified your Mr. H. S. Phillips of a deficiency identified by third party inspections involving unacceptable flexible metal tubing (hose) installations in safety-related applications. Our last report on this issue was logged TXX-6983, dated November 18, 1987. We have concluded this condition is reportable under the provisions of 10CFR50.55(e). The required information follows.

#### DESCRIPTION

In accordance with the manufacturer's requirement and the installation criteria for flexible metal hoses, the anti-torque alignment marks on each end of a hose are required to be in alignment after installation as determined by visual examination. This provision ensures the flexible metal tubing is not twisted in the installed position. An examination of 43 uninstalled hoses in the warehouse indicated 42 hoses with anti-torque alignment marks misaligned and one with indicator marks out of square. Misaligned flex hoses have been observed to be installed in the field. It was initially considered indeterminate whether these hoses were twisted during installation, or were received onsite with misaligned marks.

The cause of the deficiency appears to be errors in manufacturing practices, technical requirements, and installation activities. The deficiency is potentially applicable to all instrument metal flex hoses in safety and non-safety related applications. Additionally, construction was permitted to select installation configurations of flexible metal hoses based on generic criteria provided by engineering.

#### SAFETY IMPLICATIONS

The amount of additional stress that has been imposed on twisted flexible metal hoses is indeterminate. As a result, the capability of these hoses to perform as designed under all conditions cannot be established, and requires extensive effort to identify and rework/replace these deficient hoses.

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CORRECTIVE ACTIONS

An examination of all criteria related to the installation of flex hoses was recently completed. This resulted in the manufacturer, Parker-Metal Bellows, issuing a revised instruction manual to eliminate the anti-torque marking alignment requirement and clarifying the physical configurations and dimensional criteria. This manual includes sufficient inspection criteria to determine the absence of torsion within the flex hose. Based on the manufacturers recommendations, TU Electric will prepare inspection criteria for each flexible metal hose installation.

Flex hose installations will be re-examined as part of the Post Construction Hardware Validation Program (PCHVP) efforts. All flex hose installations will be documented and accepted using a dimensional sketch. Any installed flex hoses that does not comply with the revised installation criteria will be documented and reworked or replaced as required.

The flex hoses will be installed and inspected according to the revised criteria that is based on physical examination of the installation configuration, revised installation specification and applicable drawings. Personnel involved with the design, installation, or inspection of these flex hoses will be trained according to the revised criteria.

In addition, the selection of installation configurations will be specified by Engineering using a dimensional design document that will define each flex hose installation. Quality Control attributes and engineering hold points have been specified to ensure that all installation criteria are met.

The Unit 1 completion schedule for this issue will be commensurate with the PCHVP anticipated completion by August 11, 1988. Unit 2 activities will be conducted in accordance with the general construction schedule.

Very truly yours,

*W. G. Council*

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By:

*D. R. Woodlan*

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