



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SEQUOYAH NUCLEAR POWER PLANT, UNITS 1 AND 2
SAFETY EVALUATION REPORT FOR EMPLOYEE CONCERNS
ELEMENT REPORT EN231.1(B)

FIRE PROTECTION DESIGN - UNDERSIZED DISTRIBUTION HEADERS

1.0 INTRODUCTION

The concerns involve the failure to design and install the automatic sprinkler systems at Sequoyah in accordance with the codes and standards promulgated by the National Fire Protection Association (NFPA), i.e., NFPA-13, Standard for the Installation of Sprinkler Systems.

2.0 EVALUATION

Category: Engineering (23100)
Subcategory: Fire Protection (23101)
Element: Fire Protection Design - Undersized Distribution Headers (231.01(B))
Employee Concerns: BNP-QCP-10.35-8-16
IN-85-010-004
IN-85-534-002
IN-85-534-001

The basis for Element Report EN23101(B)-SQN, Revision 2 dated January 22, 1987, is Sequoyah Employee Concerns which state:

BNP-QCP-10.35-8-16

"Concerned individual (CI) concerned that welding smaller diameter pipes to larger diameter pipes in fire protection systems FPS could restrict the flow of water. He would feel much better if he could see a document from an insurance company or some reliable authority stating that the systems complied with specifications."

IN-85-010-004

"Problem with fire protection piping design in Unit #1. CI gave this example: Unit 1, Aux. Bldg., Elev. 692', undersized fire protection piping for the amount of sprinklers being fed by line. EG: 5 sprinkler heads on a 1" line being fed by a 1-1/4" lines. CI feels that this design does not meet fire protection codes."

IN-85-534-002

"Fire Protection lines do not meet NFPA code, both units. Some supply lines are 1/2", which is too small. Example: located in fresh air handling room aux. bldg. Unit 1. 30' from air lock to reactor bldg., on left, 713' elevation."

IN-85-534-001

"Fire Protection system not installed per NFPA code requirements. Many lines have too many sprinkler heads for the pipe size (e.g., more than 10 heads on 2" pipe, or more than 5 heads on 1-1/2" pipe); e.g., wrong pipe size in Unit 2 aux., 713 ele. 'go west toward reactor, run of 1" pipe at corner before wall with mezzanine over it'."

Concern BNP-QCP-10.35-8-16 was identified at Bellefonte but was evaluated by TVA and found to be also applicable at Sequoyah.

TVA's evaluation confirmed that the sprinkler systems in a number of areas did not meet the requirements of NFPA-13 but a two phase program had been implemented to bring the systems into compliance with NFPA-13. Phase 1 included upgrading the systems in plant areas containing equipment, components and cabling required for safe plant shutdown in the event of a fire. This work is complete. Phase 2 includes the remaining plant areas and is currently in process. Corrective Action Plan Tab-016 includes a commitment to revise the construction drawing to reflect the Phase 1 modifications and to complete the Phase 2 Program to upgrade the fire protection sprinkler systems to conform to the requirements of NFPA-13. This is acceptable for restart.

However, TVA's evaluation of concern BNP-QCP-10.35-8-16 is incomplete. The evaluation did not address the welding of small diameter piping to large diameter pipes and the resulting flow restrictions. During a March 31, 1987 telephone conversation between G. R. McNutt, TVA and W. H. Miller, Jr., NRC Region II, TVA agreed to revise Element Report 231.1 (B) to address this problem.

3.0 CONCLUSION

The concerns that the sprinkler systems at Sequoyah were not designed and installed in accordance with the NFPA requirements were evaluated and confirmed by TVA and as noted above are being corrected. However, the concern that the welding of smaller diameter pipe to larger diameter pipe would cause excessive flow restrictions in the system was not adequately addressed. Otherwise, the NRC staff concludes that TVA's investigation and resolution of the concerns described in Element Report EN 23101 (B)-SQK were adequate.

The adequacy of the welding of sprinkler system piping is identified as an open item pending completion of TVA's evaluation of the concern and subsequent review by the NRC staff. It is the staff's opinion that this should not be considered a restart item.

The reasons for this are:

1. The employee concern appeared to be expressed by an individual familiar with requirements for sprinklers. If the individual had intended the concern to cover improper welding practices, we believe that this item would have been explicitly described; and
2. The inherent conservatism in sprinkler design calculations.