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

February 8, 1988

Docket No. 50-482

Wolf Creek Nuclear Operating Corporation
ATTN: Bart D. Withers, President
and Chief Executive Officer
P. O. Box 411 Burlington, Kansas 66839

Gentlemen:

SUBJECT: SAFETY SYSTEMS OUTAGE MODIFICATIONS INSPECTION
50-482/87032

This letter forwards the results and conclusions of the Safety Systems Outage Modifications Inspection (SSOMI) at the Wolf Creek nuclear power station conducted by the NRC's Office of Nuclear Reactor Regulation. The inspection team was composed of NRC personnel and consultants. The design and procurement portion of the inspection was conducted November 2-13, 1987, and the installation and testing portion of the inspection was conducted November 9-20, 1987.

The purpose of the design and procurement portion of the SSOMI was to determine, through an examination of specific work packages, that the design, engineering, and procurement control was adequate to support the safety-related modifications and to determine whether services or products acquired to support the outage were in accordance with your commitments and regulatory requirements.

The purpose of the installation and test portion of the SSOMI was to determine, through an examination of specific work packages, that installation of the selected modifications conformed to design and installation requirements, and to verify that the repaired or modified components and systems have the required operating configurations and have been adequately tested to ensure that they are capable of safely performing their intended functions.

The inspection team identified significant weaknesses in the areas reviewed relating to the the adequacy of management control and oversight, engineering support and engineering evaluations, and corrective actions. Those weaknesses are discussed in Appendix A to this letter.

At the conclusion of the inspection, a number of equipment operability concerns remained to be resolved prior to unit startup from the refueling outage. Specifically, the operability of the Control Room Ventilation Isolation System had not been demonstrated in all anticipated modes of operation, and the single failure design of the system had been compromised by an equipment modification; the operability of the pressurizer safety valves had not been adequately demonstrated by periodic testing; the pressurizer spray valve had been incorrectly modified; several loose and missing piping supports were identified; and inadequacies were identified with respect to the design of the anti-pumping logic for the diesel generator output breakers.

The NRC Region IV staff monitored your corrective actions, and determined that adequate corrective resolution of the identified concerns was achieved prior to restart of the plant. Some of the items identified by the team may be potential enforcement findings. Any enforcement actions will be identified by Region IV in separate correspondence.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room.

You are requested to respond to this office within 60 days regarding the concerns and weaknesses identified in the enclosed inspection report. Your response should include a discussion of the role of the Wolf Creek organization responsible for the assurance of quality.

Should you have any questions concerning this inspection, please contact me or Mr. J. E. Konklin (301-492-0953).

Sincerely,

Dennis M. Crutchfield, Director Division of
Reactor Projects, III/IV/V and Special
Projects
Office of Nuclear Reactor Regulation

Enclosure: Inspection Report No. 50-842/87032

cc w/enclosure: See next page

cc:

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DATE	:01/19/88	:01/20/88	:01/20/88	:01/2/88	:01/3/88	:02/8/88

APPENDIX A

EXECUTIVE SUMMARY

An announced NRC Safety Systems Outage Modifications Inspection (SSOMI) was conducted at the Wolf Creek Nuclear Operating Corporation's Wolf Creek Generating Station during the period of November 2-13, and November 9-20, 1987.

In addition to the inspection of activities involved in this specific outage, the SSOMI team also reviewed recent Wolf Creek operational events in order to evaluate the root causes as they relate to the performance of safety system modifications. The results and conclusions of this review were discussed with NRC regional management and will be utilized in Region IV's review of the events.

Overall Conclusions

The modifications activities inspected by the SSOMI team during the Wolf Creek outage, including procedures, installed equipment and materials, and workmanship by crafts, were generally in accordance with NRC requirements and licensee commitments. The SSOMI team noted specific strengths related to the acquisition and control of equipment and materials, the trend analysis of quality findings and reported deficiencies, and workmanship by maintenance personnel. However, the team also identified weaknesses in the following areas:

1. Management Controls

In a number of cases, management failed to implement the appropriate operational procedures for the removal and return to service of equipment. The outage management controls specified in Administrative Procedure ADM 01-108, "Outage Planning," which provided definitive guidance on the planning, scheduling and performance of major outages were not implemented. Identified deficiencies which impacted the ability of maintenance crafts to perform quality work, such as wiring discrepancies between "as-built" and vendor's wiring diagrams, were not promptly resolved. Inadequate maintenance management involvement was provided for complex tasks such as safety valve bench testing and was partially responsible for a Quality Assurance Work Hold issued during repairs to piping in the Essential Service Water System. In addition, modification of the Pressurizer Spray Valve for liquid sealant injection, a temporary modification of the Control Room Ventilation Isolation System (CRVIS) which defeated the single failure design of the system, and the failure to perform timely evaluations of operational piping systems with potential wall thickness problems were further examples of inadequate management support and control of outage activities.

With regard to the recent operational events, the SSOMI team noted that, during the removal of Vital Bus NB02 from service for scheduled maintenance on October 14, 1987, the system operating procedures which specified the requirements and precautions for system operation and isolation, including the maximum time the isolated buses could be supplied by the station batteries, were not used. The failure to utilize the operational procedures and to incorporate the precautions and requirements of the procedures for the removal and return of equipment from service in accordance with the requirements of the Technical

Specifications and 10 CFR 50, Appendix A, resulted in a chain of events which culminated in the injection of lake water into the steam generators.

2. Engineering Support and Evaluations

The engineering support provided for a number of recent modifications and maintenance activities was found to be inaccurate or lacking in thoroughness. The SSOMI team identified a number of cases in which engineering evaluations failed to correctly determine the effects of proposed modifications. Examples include a wrong estimate of the time of discharge of Battery NK12 prior to the loss of Vital Bus NB02, failure to prepare for the loss by providing alternate supplies, failure to provide adequate overpressure protection for the Reactor Coolant Drain Tank, failure to recognize the single failure design criteria of the CRVIS system, inadequate design of a diesel generator output breaker anti-pumping logic which prevented the breaker from closing onto a cleared, deenergized bus, and a number of inadequately justified or documented engineering evaluations in modification packages.

3. Corrective Actions

Although, as noted above, the licensee has a good trend analysis program, the SSOMI team identified a weakness involving the adequacy of corrective actions for identified deficiencies, including the identification of root causes, evaluation of related areas for similar deficiencies, and actions to prevent recurrence. One significant example was identified during the evaluation of PMR 1903, which involved Essential Service Water pipe wall thinning and through-wall corrosion. After the deficiency was identified, there appeared to be no attempt to check for similar deficiencies on the other train, there was no immediate evaluation of the deficiency to determine whether the thinner walls violated the Updated Safety Analysis Report commitments, and the correction of the deficiency did not include a determination of a root cause and specification of actions to prevent recurrence.