



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

PDR-50-482

APR 27 1979

Ms. Mary DeBello
Saint Mary College
Leavenworth, Kansas 66048

Dear Ms. DeBello:

This is in response to your letter of January 30, 1979, to Dr. Hendrie, Chairman of the Nuclear Regulatory Commission regarding the Wolf Creek Nuclear Plant. You also expressed concerns over the use of nuclear fission for power generation and urged the use of other energy sources.

We are enclosing for your information a current summary regarding concrete problems at the Wolf Creek site. The reactor containment base mat concrete appears to be approximately 10% understrength from design strength. However, the lowered strength concrete may still be acceptable for use at the Wolf Creek site. Only a strength evaluation based on the analytical method used for the design of the reactor containment will provide the necessary information on which a determination can be made. Such an evaluation is underway. The voids in the reactor containment wall are considered repairable and similar deficiencies have been successfully repaired in the past on other facilities.

Any cost of remedial repairs, rebuilding or other remedy to these concrete deficiencies are not borne by tax dollars. The facility is owned by a utility whose rates are regulated by the appropriate State Utility Commission.

As you are probably aware, the NRC is charged with the control of federally regulated nuclear materials in order to protect the public health and safety. The NRC does not have responsibility for promoting nor developing alternate energy sources but, rather to assure that any use of nuclear power is done with adequate protection for the public and the environment. The Department of Energy has the responsibility for research and development of energy sources. You may want to contact DOE regarding other energy sources.

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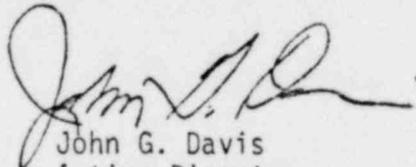
Ms Mary DeBello

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With regard to revocation of the construction permit of the Kansas Gas and Electric Company for the Wolf Creek facility, there are at the present time several formal requests for such action under consideration by the NRC. These will be addressed when investigations and evaluations into this matter have been completed.

I trust that this information is responsive to your questions and concerns. Documents referred to are available in the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. 20555, and at the local public document room located at Burlington, Kansas, for the Wolf Creek Nuclear Plant.

Sincerely,



John G. Davis
Acting Director
Office of Inspection
and Enforcement

Enclosure:
Summary of Concrete Problems
on the Wolf Creek Nuclear
Plant

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Summary of Concrete Problems
Wolf Creek Nuclear Plant
March 1979

Concrete was placed for the reactor containment building base mat in a continuous operation on December 12 and 13, 1977. The total volume of the 10 foot thick mat was nearly 6600 cubic yards. Sample test cylinders of the concrete were taken during the placement and subsequently tested at 7 and 28 days after placement to determine the rate of strength gain. Sample cylinders for the final 90-day strength determination also were obtained. On March 13, 1978, the 90-day cylinders were tested---about 9% failed to meet one test criterion; about 50% failed to meet a second test criterion. The NRC inspector was informed of the apparent low cylinder strength on March 15, 1978. Inspection Report STN 50-482/78-04, dated March 31, 1978, noted that the question of the 90-day strength of the concrete for the reactor containment base mat had not been settled.

The licensee, Kansas Gas & Electric Company, informed the NRC on May 3, 1978 that, in the licensee's opinion, the apparent low test results of the concrete strength were not required to be reported to the NRC. The licensee agreed to send the NRC for its information, a report about the licensee's investigations which had been initiated. The NRC was provided interim reports, dated May 3, 1978, May 25, 1978 August 18, 1978, and September 29, 1978, about the progress of the licensee's investigation. The licensee's final report was submitted on October 26, 1978.

Review of the final report by the NRC raised questions about the conclusions contained in the report. On November 13, 1978, the Region IV (Dallas) Office of the NRC, with the assistance of a consultant, began an investigation into the apparent low strength concrete test cylinders. By December 1, 1978, the investigators had concluded from the information available that the specifications the licensee had established for acceptance of the concrete had not been met and that the reactor containment base mat strength was in question. The NRC preliminary evaluation of the base mat concrete strength based on the test cylinders indicated a value about 10% below the intended strength of 5,000 pounds per square inch (psi).

On December 5, 1978, a meeting was held by the Director of NRC Region IV with the licensee to discuss the status of the investigation and to emphasize the importance placed on this problem by the NRC.

On December 13, 1978, the licensee reported another concrete deficiency, a through-wall void in the concrete wall beneath the equipment hatch in the reactor containment building. Another void was found beneath the personnel lock, but was not a through-wall void. In a letter issued on

December 19, 1978, the NRC, through its Region IV Office, informed Kansas Gas & Electric Company of the NRC's concerns regarding the concrete problems and the actions that the licensee was to address in order to satisfy these concerns. The concerns related to the overall quality assurance program including controls and procedures related to concrete placement, quality control, inspection, testing and qualification of personnel, as well as the independence of the inspection and verification organizations. The NRC also confirmed a commitment by the licensee to stop the placement of concrete in safety related structures until the quality assurance matters outlined in the letter were corrected and demonstrated to the satisfaction of the NRC.

On January 4, 1979, a meeting was called by the NRC to discuss the findings of the NRC investigation and the position of the licensee on those findings. The meeting, held in Bethesda, Maryland, included representatives of all involved parties and members of the public and the news media.

As a result of the meeting, the licensee initiated additional testing on cube samples stated to have been cut from the remains of the original 90-day test cylinders. The licensee submitted a report on February 28, 1979, describing the results of these additional tests. That report is currently being evaluated. The NRC in a letter dated February 8, 1979, requested that the licensee consider cut cube sample testing on remnants of 28-day test cylinders and that an assessment of the concrete strength be made using the test data obtained from all of the test cylinders. It was also requested that the value for the strength obtained be used to evaluate the load carrying capacity of the structure for the required loading combinations. The licensee's response to these items has not yet been received.

Region IV, after additional inspections at the site during February 1979, concluded that the licensee had satisfactorily met the commitments agreed to in the December 19, 1978 letter. On March 5, 1979, another letter was issued by Region IV which called for no further placement of concrete in the reactor containment building until the question on the acceptability of the base mat has been resolved. The licensee will, however, complete the necessary repairs to the voids in the reactor containment wall.

The licensee resumed placement of safety related concrete except for the reactor containment on March 6, 1979. On March 8, 1979, the licensee stopped work on safety related concrete after licensee quality control personnel observed that concrete was being moved by vibrators over a greater horizontal distance than permitted by the governing code. This deficiency was observed during the placement of a wall section of the auxiliary building. The initiative for the stop-work action was taken

by the licensee. The licensee lifted the stop-work order on March 22, 1979, relative to placement of safety-related concrete except for difficult placements and concrete in the reactor containment building.

Until results are received from the licensee relating to a structural evaluation using the actual test strength of the 90-day test cylinders, no final determination can be made on the acceptability of the base mat. It should be noted that the need for 5000 psi strength concrete was determined by the licensee's architect-engineer and the value is not an NRC requirement. Typical base mat concrete strengths at other nuclear facilities have been specified at 3000 and 4000 psi at 28-days while others might require 6000 psi at 90-days. Needed concrete strength at a specific site must be consistent with the soil conditions and the specific structural loadings at each individual site.

- There has been considerable public interest in this case resulting in several requests to the NRC for suspension or revocation of the permit to construct this plant. These requests still remain for final action.

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