ARKANSAS POWER & LIGHT COMPANY
POST OFFICE BOX 551 LITTLE ROCK, ARKANSAS 72203 (501) 371-4000

March 10, 1983

ØCANØ38311

Director of Nuclear Reactor Regulation
ATTN: Mr. J. F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Director of Nuclear Reactor Regulation
ATTN: Mr. Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Arkansas Nuclear One - Units 1 & 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Additional Information Concerning
Spent Fuel Storage Expansion

Gentlemen:

Your letter dated February 15, 1983 (ØCNAØ28317), requested additional information regarding the proposed spent fuel storage expansion. Attached is our response to your request.

Very truly yours,

John R. Marshall
Manager, Licensing

JRM:MD:sl

A001

1. Provide a description of any material surveillance and monitoring program for the spent fuel pool. In particular, provide information on the frequency of inspection and the type of samples used in the monitoring program.

Response:

IN-USE SURVEILLANCE PROGRAM FOR BORAFLEX NEUTRON ABSORBING MATERIAL

Program Design Intent

All materials used within the ANO storage system for spent nuclear fuel are qualified to a level of performance predicated upon calculated worst case environmental conditions and are based on accelerated testing of the materials to levels of service life corresponding to that calculated environment. Because such environmental compatibility testing is accelerated, it is prudent that each of the system components be monitored to some extent throughout the service life to assure that the actual in-service performance remains within acceptable parameters as defined by the accelerated testing. For many of the materials, monitoring throughout the service life is relatively easy, however, the poison material is typically encased in a stainless steel jacket precluding both visual and convenient physical examination during the in-service condition.

A poison surveillance program which allows access to representative poison samples without disrupting the integrity of the storage system will be used. The program will include not only the capability to evaluate the material in a normal use mode, but to forecast changes that might occur within the storage system at a time significantly prior to the normal use mode occurrence of such changes.

Description of Specimens

The poison used in the surveillance program will be representative of the material used within the storage system. It will be of the same composition, produced by the same method, and certified to the same criteria as the production lot poison. The sample coupon will be of a similar thickness as the poison used within the storage system and not less than 2" x 4" on a side. Each poison specimen will be encased in a stainless steel jacket of an identical alloy to that used in the storage system, formed so as to encase the poison material and fix it in a position and with tolerances similar to that designed into the storage system. The jacket will be mechanically closed without welding in such a manner as to retain its form throughout the use period yet allow rapid and easy opening without contributing mechanical damage to the poison specimen contained within.

A series of eight of the jacketed poison specimens shall be suspended from a rigid strap so designed as to be hung into the pool from a surface support. The specimen location will be adjacent to a designated storage cell with design ability to allow for removal of the strap, providing access to a particular specimen.

Long Term Surveillance

At the time of the first off-load of spent fuel, one specimen strap will be located directly adjacent to a non-poisoned wall of a cell designated as a long term testing location and containing a freshly spent fuel element. Both the spent fuel element and the specimen strap will be controlled to remain in fixed location throughout the entire storage life of the pool. At each incremental five year period subsequent to the initial installation, the strap will be raised from the pool and one specimen taken for evaluation. Based on a minimum of eight specimens, a 40 year operational period can be evaluated by the generation of specific evidence of poison performance under normal operational conditions.

Accelerated Surveillance

At the time of the first off-load of spent fuel, one specimen strap will be suspended in the pool adjacent to a non-poisoned wall of a cell designated as an accelerated testing location and containing a freshly spent fuel element. At the time of the second off-loading, the fuel element in the designated accelerated testing cell will be removed from that cell location and relocated to a new cell or permanent storage. The specimen strap is withdrawn from the pool and a jacketed specimen removed from the strap for evaluation. The specimen strap is replaced in the pool adjacent to the same designated accelerated testing cell and a freshly spent fuel element from the second off-loading is placed into the designated cell. This cycle is repeated eight times with each cycle being comprised of the removal of a jacketed specimen for evaluation and the placement within the designated accelerated testing cell of a freshly spent fuel element from the most recent off-loading. By evaluation of the specimens an accelerated monitor of environmental effects on the poison will be obtained, simulating within an eight year period the effects of cycling freshly spent fuel into the same fuel cell once every five years for a period of 40 years. The five year use cycle typically represents the most severe fuel relocation schedule under administrative or procedural controls.

Specimen Evaluation

Upon removal of the jacketed poison specimen from the fuel pool at the designated time, a careful evaluation of that specimen will be made to determine it's actual condition as well as it's apparent durability for continued function. Separation of the poison from the stainless steel specimen jacket must be performed carefully to avoid mechanically damaging the poison specimen. Immediately upon removal, the specimen and jacket section will be visually examined for any effects of environmental exposure. Specific attention will be directed to the examination of the stainless steel jacket for evidence of corrosion and to the examination of the poison material for evidence of physical degradation. Functional evaluation of the poison material is accomplished by the following measurements:

a. A neutron radiograph of the poison specimen will allow for a determination of the maintenance of uniformity of the boron distribution.

b. Neutron attenuation measurements of the specimen made in a fashion consistent with that described in the Poison Material Qualifying Test Data will, by comparing with the attenuation of preirradiated poison as listed in that document, allow evaluation of the continuing nuclear effectiveness of the poison. Consideration will be given in the analysis of the attenuation measurements for the level of accuracy of such measurements as indicated by the degree of repeatability normally observed by the testing agency.

c. A measurement of the hardness of the poison material will establish the continuance of physical and structural durability. The criteria of hardness acceptability includes all values not less than the hardness listed in the Qualifying Test Documents for the poison material under the category of preirradiated hardness. The actual hardness measurement should be made after the specimen has been withdrawn from the pool and allowed to air dry for not less than 48 hours to allow for a meaningful direct correlation with the preirradiated sample.