

SAFETY EVALUATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 7
(ARKANSAS POWER AND LIGHT COMPANY)

A. Evaluation Concerning Implementation Date of a Fire Protection Program Item

In Amendment No. 1 to License No. NPF-6 Section 2.C(3)(e) item 3.3 required that the implementation of actions required to close out item 3.3 "Protection From Water Spray" be completed by September 1, 1978.

The licensee's letter dated October 17, 1978 states that item 3.3 requires the installation of drip shields over certain safety related alternating current panels. The licensee's letter also states that the date agreed upon by the staff and the licensee for the installation of water sprinkler systems in these areas is prior to startup following the first regularly scheduled refueling outage. Therefore, the licensee concludes that installation of the spray shields to these electrical panels before installation of the sprinkler system serves no useful purpose and requests a change in the implementation date for installation of the spray shields.

We agree with the installation of the water spray systems in the portion of Fire Zone 2109-U wherein panels 2R51, 2R52, 2R53 and 2R54 are located prior to startup following the first regularly scheduled refueling outage. Therefore, we agree that the protective shields must also be installed prior to startup following the first regularly scheduled refueling outage instead of the previously required date of September 1, 1978. Therefore, this item is resolved.

B. Evaluation Concerning Containment Radiation Monitors

On June 23, 1978 the licensee submitted additional information regarding the environmental qualifications of safety related equipment. This equipment included the containment radiation monitors which are located inside the containment for the purpose of monitoring the radiation levels inside the containment following an accident. The licensee's response stated that due to certain operational problems experienced with a previous design of radiation monitor, a decision had been made to proceed with installation of an alternate design. The staff requires that such an alternate design be shown to be sufficiently qualified by type test or analysis with environmental conditions which envelope, with margin, the ANO-2 plants design envelope requirements. The licensee further stated that information describing the environmental qualification test plan and the test results would be provided as soon as they became available.

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On August 31, 1978 the licensee submitted additional information which indicated that previously unforeseen delays had occurred in the testing program and the required test results information would not be available in time to support the planned schedule for activities following the attainment of initial reactor criticality. As an alternate to having available an acceptably qualified and operable containment radiation monitor located inside the containment the licensee proposed, for an interim period, to rely on a procedure to monitor radiation levels inside containment using portable radiation monitors at selected locations outside the containment.

On September 14, 1978 the licensee submitted further details regarding calculational methods used to determine the location and calibration requirements for the portable radiation monitors. This submittal also included a description of the procedures which would be followed to determine the radiation level inside the containment. The NRC Office of Inspection and Enforcement will monitor the implementation of the procedure described by the licensee for measuring the post-accident radiation levels inside the containment.

By application dated October 10, 1978 the licensee submitted a request for a change to the technical specifications to enable reliance on the portable radiation monitors. Upon further communication with the licensee it is agreed that the portable radiation monitoring procedure will be relied upon to meet the post-accident radiation monitoring function at all times prior to startup following the first regularly scheduled refueling outage. Subsequent to that time the staff will require that radiation monitors which have been shown to be acceptably environmentally qualified be operable and located inside the containment.

Accordingly, we have approved the changes to the Technical Specifications (Tables 3.3-10 and 4.3-10 on pages 3/4 3-40 and 3/4 3-41) for plant operation through July 31, 1980 based on our conclusions that:

- (1) The locations chosen for the portable detector readings outside containment assure a good correlation to inside containment levels without endangering personnel taking the reading; and,
- (2) the calculational methods needed to determine the actual radiation level in the containment readily provide the post loss-of-coolant accident radiation levels inside containment within a reasonable accuracy.

We further conclude that operation of the ANO-2 plant in Modes 2 and 1, with respect to this matter, is acceptable provided the plant procedures are modified, as addressed in the licensee's September 14, 1978 submittal prior to attaining initial criticality.

C. Evaluation Concerning the Environmental Qualification of Safety Related Equipment

In Supplement No. 2 to the Arkansas Nuclear One - Unit 2 (ANO-2) Safety Evaluation Report and in Amendment No. 1 to License No. NPF-6 we provided our evaluation of this matter. We concluded that the qualification methodology, utilizing separate effects testing, used to qualify the Foxboro and Fischer and Porter safety related equipment located inside containment was unacceptable. We required that the licensee conduct additional confirmatory testing on this equipment to ensure that it would maintain its functional operability when it is exposed sequentially to the radiation, seismic and loss-of-coolant accident environment that is calculated to occur at the plant (with margin). Alternatively, the applicant would be required to replace this equipment with other transmitters that are qualified to these specified conditions.

As a result, the applicant elected to replace all the Fischer and Porter equipment (i.e., Models 50EP1041 and 13D2495) inside containment with Rosemount Model 1153 instruments and submitted a Rosemount qualification test report (No. 3788 dated March 1978) to support the qualification adequacy of this equipment.

In addition, the applicant has completed a confirmatory thirty-day qualification test of the Foxboro Model E11AH transmitter and a Rosemount Model 1153A transmitter in accordance with the sequential testing requirements specified above. The confirmatory test consisted of irradiating the transmitter to 3.7×10^7 rads prior to seismic testing. The units were then exposed to loss-of-coolant accident environment of 304 degrees Fahrenheit, 56.4 pounds per square inch gauge (psig) for about ten minutes followed by discrete reductions in temperature and pressure to 150 degrees Fahrenheit, and five psig after 24 hours. These conditions were maintained for the remainder of the 30 day test. During the first 24 hours the units were subjected to chemical sprays with a pH of 11.0. These conditions also envelope the conditions that these instruments would be exposed to in the event of a postulated main steamline break accident.

The licensee submitted in letters dated September 26, 1978 and October 16, 1978, preliminary test data for these transmitters obtained through the first twelve days of the simulated loss-of-coolant accident environment test. These preliminary data showed that, for the first twelve days, the Foxboro Model E11AH and Rosemount Model 1153A transmitters maintained their functional operability and met the acceptance criteria. However, the applicant stated that the Foxboro transmitter output failed to zero on the twelfth day of testing. The thirty-day test was completed with both transmitters remaining in place in the test chamber.

Subsequent to the test, investigation identified the failure mechanism of the Foxboro transmitters as a wiring short circuit external to the hostile environment of the test chamber. That failure was corrected and the applicant has reported to the staff that the functional operability of the Foxboro transmitter was reestablished and that it met acceptance criteria. They also reported that the Rosemount transmitters maintained their operability throughout the test.

Based on our review of the Rosemount test report, the preliminary test data from the confirmatory tests described above, and the satisfactory resolution of concerns identified during the review regarding the design interface, we conclude that both the Foxboro Model E11AH and Rosemount Model 1153A transmitters have been acceptably qualified and, therefore, are acceptable for operation in Mode 1 (Power Operation).

D. Evaluation Concerning the Core Protection Calculator System

- (1) CPCS Position No. 1, Power Distribution Algorithm
- (2) CPCS Position No. 5, Cable Separation
- (3) CPCS Position No. 12, Electrical Noise and Isolation

In Amendment No. 1 to License No. NPF-6 license condition No. 2. C.(3)(k) subparts 1, 2 and 3 specified that in response to each of the subparts a submittal would be required by a specific date. The choice of the specific date, February 28, 1978, was predicated on an initial criticality date of early September, 1978. It is now apparent that initial criticality will not be achieved until some significant time after September 1978 and therefore, the status of the startup and power ascension testing program will not permit the completion of these tests and the reporting of the results by the specified date.

Therefore, we conclude that it is more appropriate to condition the license to require that the results of the testing necessary to complete the licensee's response to CPCS Positions 1, 5 and 12 be included in the startup report required by Technical Specification No. 6.9.1. Accordingly, conditions 2.C.(3)(k) subparts 1, 2 and 3 of Amendment No. 1 are modified to require this information to be reported in the startup report required by Technical Specification No. 6.9.1.

(4) CPCS Position No. 19, Software Change Procedure Qualification

In Amendment No. 1 to License No. NPF-6 license condition No. 2.C.(3)(k)(4) specified that additional information related to this subject be submitted for the Commission's review and approval prior to Mode 2 operations.

The licensee has completed the submittal of responses to all items identified by the staff as requiring resolution to enable the issuance of an approval of the licensee's proposed software change procedure. The Staff is currently reviewing this information.

An acceptable software qualification procedure is not necessary for the safe operation of the ANO-2 plant since the currently existing software for ANO-2 is considered acceptable by the staff for operation of the plant up to the 100 percent authorized power level. However, should the licensee wish to make a change to the software a software change procedure acceptable to the staff is required.

Therefore, we consider that it is appropriate to condition the license only to require that no changes be made to the software pending the completion of our review of the information submitted by the licensee. Accordingly, license condition No. 2.C.(3)(k)(4) of Amendment No. 1 has been modified to delete the requirement that this issue be resolved prior to entry into Mode 2 operations.

E. Evaluation Concerning Fire Barrier Testing

In Amendment No. 1 to License No. NPF-6, license condition No. 2.C.(3)(n) specified that the licensee was to submit a report on the results of fire testing conducted on a fire barrier containing steel conduit loaded with cables and sealed at the ends of the conduit.

On August 31, 1978 the licensee submitted a report concerning the qualification testing of conduit penetration fire barrier seals.

We have reviewed the licensee's submittal and find that this test and its results adequately demonstrate the capability of the tested seal design for sealing of rigid steel conduit at the end rather than at the barrier to prevent propagation of fire through the conduit. On this basis, we conclude that this item is satisfactorily resolved.

F. Offsite Power System

Degraded Grid Voltage

We stated in Supplement No. 2 (issued on September 2, 1978), that the licensee had submitted by letter, dated March 30, 1978, a summary of a degraded grid voltage study and details of implemented design modifications which would ensure the operability of the Class IE electrical distribution system.

We reviewed the licensee's degraded grid voltage analysis and the details of the design modifications and found them to be acceptable provided an additional 92 percent relay trip was provided on each of the safety trains as an augmented second level of under voltage protection. This second level of under voltage protection will trip the incoming offsite power source at the 4160 volt safety busses in the event the 480 volt safety busses drop below 92 percent of their rated value.

The time allowed for the licensee to install and complete the additional 92 percent relay trip on each safety train was stipulated as February 28, 1979 and was so stated in Condition 2.C.3(o) as provided in Amendment No. 1 to License NPF-6 issued on September 1, 1978.

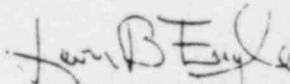
By memorandum dated November 13, 1978, we were notified by the Office of Inspection and Enforcement that the licensee has met the provisions of Condition 2.C.3(o) to License NPF-6 as amended. Therefore, we conclude Facility Operating License NPF-6 can be amended by removing the stipulations of Condition 2.C.3(o) as so stated in Amendment No. 1 to License NPF-6.

Conclusion

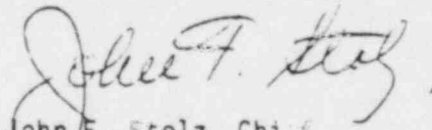
We have concluded, based on the considerations discussed above, that:

- (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration,
- (2) there is reasonable assurance that the health and safety of the

public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.



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DATED: DEC 1 1978