50-313

JUN 17 1970

Honorable J. W. Fulbright
United States Senate

Dear Senator Fulbright:

I am pleased to reply to your letter of April 22, 1970, regarding the effect that the future operation of the Arkansas Nuclear One (formerly Russellville) plant may have upon the Arkansas River.

In late November 1967, the Arkansas Power & Light Company submitted an application to construct and operate a nuclear power station to be located about 6 miles from Russellville on a peninsula in the Dardanelle Reservoir on the Arkansas River, Pope County, Arkansas. A construction permit was issued for this facility on December 6, 1968.

As you acknowledged in your letter, at the time of our construction permit review of the Arkansas Nuclear One application, the AEC's authority was essentially limited to those considerations falling within the area of radiological health and safety and common defense and security. The information we received from the applicant at that time regarding environmental-thermal effects was limited. Cooling water for the plant will be taken from the Dardanelle Reservoir on the Illinois Bayou east of the plant and will be returned to the Arkansas River west of the plant. The plant will incorporate a nuclear steam supply system using a pressurized water reactor with a power rating of 2552 thermal megawatts.

During 1969, the AEC conducted a survey of nuclear power plant licensees and applicants for licenses to obtain background data on research and studies they had undertaken or planned concerning effects of the discharge of heated water from nuclear power plants. I am enclosing a summary of the information received from Arkansas Power & Light Company regarding its plant near Russellville.

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The Water Quality Act of 1965 provides a program through which water quality standards, including standards on thermal effects, are developed by the States and approved by the Secretary of the Interior. Under this program, the Secretary of the Interior has approved water quality standards for interstate waters for the State of Arkansas. Further, the recently enacted Water Quality Improvement Act of 1970 requires applicants for a construction

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permit and operating license for any nuclear power plant which will discharge effluents into the navigable waters of the U. S. to provide the AEC with certification from the State or interstate pollution control agency, or the Secretary of the Interior, as appropriate, that there is reasonable assurance that the plant will not violate applicable water quality standards. The AEC would generally be prohibited from issuing any such permit or license without having received this certification.

Where actual construction has commenced prior to the date of enactment of this Act, as it has in the case of Arkansas Nuclear One, section 21(b)(7) of the Act provides that the certification otherwise required by the Act shall not be required for a license or permit issued after the date of enactment of the Act to operate the facility, "except that any such license or permit issued without certification shall terminate at the end of the three-year period beginning on the date of enactment of such Act of 1970 unless prior to such termination date the person having such license or permit submits to the Federal agency which issued such license or permit a certification and otherwise meets the requirements of this subsection." These requirements will be applicable to the Arkansas Nuclear One facility.

During operation of a nuclear power plant, very small amounts of low-level radioactivity material are permitted by AEC regulations to be released into the environment at controlled rates and in controlled amounts. The release limits in AEC regulations are consistent with guides developed by the Federal Radiation Council and approved by the President for the guidance of Federal agencies. These guides in turn take into account and are supplemented by recommendations of the National Council on Radiation Protection and Measurements and the International Commission on Radiological Protection. During the operation of a nuclear power plant, environmental radiological monitoring programs are carried out by licensees, some States, the U. S. Public Health Service, and the AEC. Experience has shown that low-level radioactive wastes released during operation of plants similar to the Arkansas Nuclear One facility have been generally less than a few percent of authorized limits.

As construction of the plant nears completion, Arkansas Power & Light Company will apply for an operating license, and the AEC will review the final, as-built, design and operating features of the plant to determine that all AEC safety requirements are met. No public hearing on the operating license is required in the absence of a request by a person whose interest may be affected. If an operating license is issued, the facility may be operated only in accordance with the terms of the operating license and the Commission's regulations. The licensee remains under continued surveillance of the Commission's regulatory staff.

On May 18, 1970, Arkansas Power & Light announced that it plans to construct a second nuclear generating unit on the Arkansas Nuclear One site, and that it has an option to purchase another unit from the nuclear steam system supplier, Combustion Engineering Company. The power level of this second unit is indicated to be slightly greater than that for Arkansas Nuclear One. The announcement also indicates that this second unit will use closed cycle cooling towers rather than the Arkansas River for cooling water, and that the unit is scheduled for commercial operation in 1976.

Please let us know if we can be of further assistance in this matter.

Cordially,

Chairman

Enclosure:
Summary of Effects on the
Discharge of Heated Water

DISTRIBUTION:
Suppl.
DR Reading
DRL Reading
PWR-3 Reading
PDR
H. L. Price, DR
R. C. DeYoung, DRL
R. A. Birkel, DRL
F. Karas, DRL (2)
P. W. Howe, DRL
H. Shapar, OGC
B. Shur, OGC
OCR (2)
G. Ritter, DR

w/bcc to: Chairman Seaborg (2)
Commissioner Ramey
Commissioner Johnson
Commissioner Thompson
Commissioner Larson
Secretariat (2)
J. Yore, ASLB

FOR PREVIOUS CONCURRENCES SEE ATTACHED YELLOWS

REVISED IN OFFICE OF THE DIRECTOR OF REGULATION TO MAKE CHANGES SUGGESTED BY OGC. 6/9/70

DRL:PWR-3	DRL:AD/PWR's
KRGoller	RCDeYoung
6/9/70	6/ /70

CRESS T42/R1-2-3 OFFICE ▶	DRL:PWR-3 x7441	DRL:DIR	OGC	REG	OCR
SURNAME ▶	RABirkel:cn	PAMorris		HLPrice	
DATE ▶	6/9/70	6/ /70	6/ /70	6/15/70	6/16/70

Form AEC-318 (Rev. 9-53) U.S. GOVERNMENT PRINTING OFFICE : 1969— O-364-598

Honorable James W. Fulbright
United States Senate

Dear Senator Fulbright:

I am pleased to reply to your letter of April 22, 1970, regarding the effect that the future operation of the Arkansas Nuclear One (formerly Russellville) plant may have upon the Arkansas River.

In late November 1967, the Arkansas Power & Light Company submitted an application to construct and operate a nuclear power station to be located about 6 miles from Russellville on a peninsula in the Dardanelle Reservoir on the Arkansas River, Pope County, Arkansas. A construction permit was issued for this facility on December 6, 1968.

As you acknowledged in your letter, at the time of our construction permit review of the Arkansas Nuclear One application, the AEC's authority was essentially limited to those considerations falling within the area of radiological health and safety and common defense and security. The information we received from the applicant at that time regarding environmental-thermal effects was limited. ~~Cooling water for the plant will be taken from the Dardanelle Reservoir on the Illinois Bayou east of the plant and will be returned to the Arkansas River west of the plant.~~ The plant will incorporate a nuclear steam supply system using a pressurized water reactor with a power rating of 2552 thermal megawatts. ~~The thermal efficiency of this type of plant is generally in the range of 32 to 35 percent, so that about 1700 megawatts of heat energy will be deposited in the Arkansas River when the plant is operating at its anticipated full power level.~~ This heat energy will be transferred to the River by the plant's condenser cooling water which, based on what we have seen in other similar plants, we would expect to have a temperature increase in passing through the plant of about 20 to 25 °F. This temperature increase would be reduced as the cooling water is mixed into the Arkansas River.

During 1969, the AEC conducted a survey of nuclear power plant licensees and applicants for licenses to obtain background data on research and studies they had undertaken or planned concerning effects of the discharge of heated water from nuclear power plants. I am enclosing a summary of the information received from ~~Commonwealth Edison Company~~ Arkansas Power & Light Company regarding its ~~Zion~~ plant.

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Form AEC-318 (Rev. 9-53) AECM 0240

U.S. GOVERNMENT PRINTING OFFICE : 1968 O—1.3-617

The provisions of the N-E-P-A apply to the

The National Environmental Policy Act of 1969, which was approved by the President on January 1, 1970, has modified our authority by directing all Federal agencies to consider environmental aspects in major Federal actions. Such actions have been interpreted by the AEC to include construction permits and operating licenses for nuclear power plants. ~~and have been adopted in the form of an Appendix D to 10 CFR 50. This extended area of coverage will be applied during the~~ operating license review of Arkansas Nuclear One, which is currently scheduled to be initiated early in 1971.

~~In addition,~~ The Water Quality Improvement Act of 1970 will require applicants for construction permits and operating licenses for any nuclear power plant which will discharge effluent into the navigable waters of the United States to provide the AEC with certification from the State or interstate pollution control agency, or the Secretary of the Interior, as appropriate, that there is reasonable assurance that the plant will not violate applicable water quality standards. The AEC would generally be prohibited from issuing any such permit or license without having received this certification.

Where actual construction has commenced prior to the date of enactment of this Act, as it has in the case of Arkansas Nuclear One, section 21(b)(7) of the Act provides that the certification otherwise required by the Act shall not be required for a license or permit issued after the date of enactment of the Act to operate the facility, "except that any such license or permit issued without certification shall terminate at the end of the three-year period beginning on the date of enactment of such Act of 1970 unless prior to such termination date the person having such license or permit submits to the Federal agency which issued such license or permit a certification and otherwise meets the requirements of this subsection." These requirements will be applicable to the Arkansas Nuclear One facility.

Other contaminants which might be released as a consequence of the plant's operation include a small amount of radioactive liquid wastes generated during normal plant operation. These wastes will be collected, stored, treated, measured for radioactivity, and discharged on a batch basis with continuous monitoring during discharge, through a line to the plant's cooling water discharge into the Arkansas River. Gaseous wastes will be collected, monitored, diluted and released to the atmosphere. If the radioactivity levels exceed prescribed limits, the gases will be compressed and stored in waste gas decay tanks.

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SURNAME ▶						
DATE ▶						

ARKANSAS POWER & LIGHT COMPANY, Pine Bluff, Ark.

Plant(s)	Nuclear Contr.	Architect Engineer	Reactor Type	Power Mw(t)	Mw(e)
Arkansas Nuclear One	Babcock & Wilcox	Bechtel Corp.	PWR	2,452	850

A construction permit was issued to Arkansas Power & Light, an operating subsidiary of Middle South Utilities, Inc., in December 1968, for a single unit at London, Ark., six miles from Russellville. Commercial operation is scheduled by December 1972.

Condenser Cooling Source and Method

The plant is being built on a peninsula in the Dardanelle Reservoir on the Arkansas River, Pope County, Ark., which has a minimum flow of 3,500 cfs and an average flow of 40,000 cfs. Cooling water (1,700 cfs) will be taken from the reservoir, passed once through the condenser (temperature rise 15°F) and returned to an 80-acre cove through a canal with a free discharge of low velocity.

State criteria (approved by the Secretary of the Interior) specify that, after allowance for mixing, the maximum temperature shall not be elevated above 20°C (68°F) in trout streams, 30°C (86°F) in smallmouth bass streams, and 35°C (95°F) in other streams. Temperature of a stream shall not be increased or decreased more than 5°F.

Thermal-Related Environmental Studies

Both a preoperational analytical study and a laboratory study including thermal-hydraulic model analysis were conducted by Bechtel Corp. The Hydro-Research Science Co. performed model tests. Ecological data sampling began in 1968 (temperature, water quality, and specific organisms) and will be completed in 1972. Operational ecological studies are planned to begin 1972 and continue for five years. Clarence B. Sinclair, Little Rock University, is ecological consultant.

Temperature monitoring will be by grid network design at radii of 500 feet, 800 yards, 1,800 yards, and 1.5 miles from entrance of discharge canal. Preoperational thermal sampling will be once during winter, spring, and fall seasons and three times during the summer. Operational sampling will

be at monthly, or more frequent, intervals. Water quality sampling, also using same grid network and frequency, will involve collection of samples from 21 stations at 10 different depths. Ecological sampling, including collection of fish by gill nets, will be on a six-month pre-operational frequency and a three-month operational frequency. Types of investigations in progress include identification of species and abundance indices for fish, phytoplankton, zooplankton, periphyton, and invertebrates.

Reports Furnished

1. "Dardanelle Reservoir - Heat Dissipation Studies," Bechtel Corp., July 1968, 75 pages, 23 figures.
2. "Hydraulic Model Investigations - Dardanelle Reservoir - Cooling Water Studies," Bechtel Corp., Feb. 1969, 31 pages, 21 figures.
3. "Dardanelle Reservoir Background Survey," May 15, 1968, 9 pages, 2 figures.
4. "Dardanelle Reservoir Illinois Bayou Embayment Background Survey, Progress Report #1," Clarence B. Sinclair, Little Rock University, 1968, 22 pages including tables and figures.
5. "Dardanelle Reservoir Illinois Bayou Embayment Background Survey, Progress Report #II," Clarence B. Sinclair, Little Rock University, July 1969, 11 pages including tables.