

BEFORE THE  
UNITED STATES ATOMIC ENERGY COMMISSION

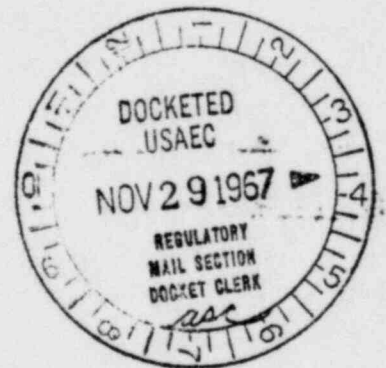
DOCKET NO. 50- 3/3

Regulatory Suppl F Cy2

In the Matter of  
ARKANSAS POWER & LIGHT COMPANY

APPLICATION FOR LICENSES  
UNDER THE ATOMIC ENERGY ACT OF 1954  
AS AMENDED

for  
RUSSELLVILLE NUCLEAR UNIT



DATE: November 24, 1967

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Before The  
UNITED STATES ATOMIC ENERGY COMMISSION

Docket No. 50-\_\_\_\_\_

\_\_\_\_\_  
In the Matter of  
Arkansas Power & Light Company

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APPLICATION FOR LICENSES

Arkansas Power & Light Company (hereinafter sometimes referred to as "Applicant") hereby makes application, pursuant to the provisions of the Atomic Energy Act of 1954, as amended, and the Atomic Energy Commission's Rules and Regulations thereunder, for the necessary licenses (including a construction permit) to construct, own, use and operate a nuclear electric generating plant to be located in Pope County, Arkansas, and to be known temporarily as "Russellville Nuclear Unit" (hereinafter sometimes referred to as "Facilities") as an integral part of its total operating system.

This application consists of the following two parts:  
(a) The general information required by 10 CFR §50.33, which is set out herein; (b) The technical information and safety analysis report required by 10 CFR §50.34, which is set out in a separate document entitled "Arkansas Power & Light Company, Russellville Nuclear Unit, Preliminary Safety Analysis Report," forwarded herewith and made a part hereof.

GENERAL INFORMATION

a. Name of Applicant

Arkansas Power & Light Company

b. Address of Applicant

Ninth and Louisiana Streets  
P. O. Box 551  
Little Rock, Arkansas 72203

c. Description of Business or Occupation of Applicant

Applicant is an operating public utility engaged exclusively in the production, transmission, distribution and sale of electric power and energy in the State of Arkansas and in relatively insignificant areas in adjoining states immediately adjacent to the Arkansas border. Applicant's service area is shown generally on its system map on page 33 of its annual report to shareholders for 1966. A copy of both the 1966 and 1967 reports to shareholders are attached hereto as Exhibit II. This service area encompasses approximately 18,200 square miles, having an estimated population on January 1, 1967, of about 1,150,000.

Applicant provides electric service in 61 of the 75 counties in Arkansas to approximately 350,000 customers.

It supplies electricity directly to retail customers in 231 incorporated municipalities. It also sells power and energy at wholesale to seven other incorporated municipalities, to nine Rural Electrification Administration cooperatives, and to one private utility.

Applicant's electric revenues for 1967 totalled \$107,943,626, of which \$33,656,093 was derived from residential sales, \$33,987,583 from industrial sales, \$24,630,824 from commercial sales and \$15,669,126 from other sources. In the five-year period ended December 31, 1967, Applicant experienced a growth in annual gross electric revenues of approximately 41%. The average annual kwh sales per residential customer increased from 3,043 kwh to 4,650 kwh during this period.

The total installed generating capability of Applicant's electric utility plant is 1,734,000 kw, consisting of five steam-electric plants with a total installed capability of 1,659,000 kw, two hydro-electric plants with a total installed capability of 69,000 kw and diesel-electric units with a total capability of 6,000 kw. In addition Applicant is a party to contracts with Southwestern Power Administration and Tennessee Valley Authority which entitle Applicant to



purchase 324,000 kw per year. The peak demand on Applicant's system thus far in 1968 has been 1,927,000 kw, an increase of 12.7% over the maximum experienced in 1967.

At July 31, 1968, Applicant's net utility plant totalled \$458,100,975. For the five years and seven months ended on that date, gross property additions and retirements totalled \$215,187,593 (not including \$28,942,428 of construction work in progress at July 31, 1968,) and \$27,878,730, respectively. Applicant presently has under construction one gas-fired steam generating unit of 530,000 kw capability for completion in 1969.

At December 31, 1967, Applicant's transmission lines consisted of approximately 3,336 circuit miles of various voltages and types of structure, of which approximately 3,315 miles are lines carrying 100,000 volts or more. Distribution lines consisted of approximately 23,445 pole, cable or bank miles (irrespective of the number of circuits) of wood pole and underground lines.

Applicant is an operating subsidiary of Middle South Utilities, Inc. Applicant and Mississippi Power & Light Company, Louisiana Power & Light Company and New Orleans Public Service, Inc., the three other principal operating

companies in the Middle South System, share generating capacity and other power resources. Each of these four companies constructs generating units to meet additional requirements of the entire Middle South System and sells capacity and energy therefrom. This arrangement enables each company to install larger and more economical generating units than would otherwise be feasible.

In addition, arrangements have been made under which Applicant, the other three principal operating companies of the Middle South System, seven neighboring utilities, and Tennessee Valley Authority exchange capacity which is available for such purpose because of diversity in the periods of peak demand. The diversity capacity available for exchange is approximately 1,500,000 kw, of which Applicant's share is approximately 12.12%. A network of Extra High Voltage transmission lines and related facilities have been constructed for the purpose of carrying out this exchange arrangement.

Applicant also has direct transmission line connections with the facilities of Tennessee Valley Authority, Arkansas-Missouri Power Company, Southwestern Electric Power Company, Empire District Electric Company, Oklahome Gas & Electric Company, Arkansas Electric Cooperative Corporation, and

certain multiple purpose projects of the Federal Government located in Arkansas. In addition, there are direct transmission connections between the Middle South System and Gulf States Utilities Company, Central Louisiana Electric Company, and Mississippi Power Company.

d. Organization and Management of Applicant

Applicant is a corporation organized and existing under the laws of the State of Arkansas, and its principal office is located in Little Rock, Arkansas, at the address stated above.

All of Applicant's principal officers and its directors are citizens of the United States. Their names and addresses are as follows:

DIRECTORS

<u>Name</u>	<u>Address</u>
G. L. Andrus	New Orleans, La.
Donald Barger	Russellville, Ark.
Lawrence Blackwell	Pine Bluff, Ark.
Richard C. Butler	Little Rock, Ark.
L. C. Carter	Stuttgart, Ark.
J. B. Lambert	Helena, Ark.

William McCollam, Jr.	Little Rock, Ark.
Reeves E. Ritchie	Little Rock, Ark.
Marshall T. Steel	Conway, Ark.
L. A. Watkins	Harrison, Ark.
R. E. L. Wilson III	Wilson, Ark.
Harold A. Young	North Little Rock, Ark.

PRINCIPAL OFFICERS

<u>Name</u>	<u>Address</u>
Reeves E. Ritchie, President	Little Rock, Ark.
William McCollam, Jr., Senior Vice President	Little Rock, Ark.
A. B. Coen, Vice President, Treasurer & Secretary	Pine Bluff, Ark.
C. A. Clift, Vice President, Geographic Divisions and Sales	Little Rock, Ark.
W. M. Shepherd, Vice President, Public Relations and Area Development	Little Rock, Ark.
J. D. Phillips, Vice President and Chief Engineer	Pine Bluff, Ark.

Applicant is not owned, controlled or dominated by any alien, any foreign corporation, or any foreign government. It is making this application in its own behalf, and not as agent or representative of any other person.



e. Class and Period of License Applied for and Use to Which Facilities Will be Put.

The license hereby applied for is a Class 104(b) construction permit and operating license as defined by 10 CFR §50.21. It is requested for a period of forty (40) years. Applicant further requests such additional source, special nuclear, and by-product material licenses as may be necessary or appropriate to the acquisition, construction, possession and operation of the licensed facilities. The Babcock & Wilcox Company will supply the first core and reload batches 4, 5 and 6 for the nuclear generating unit.

The Facilities will be used as a part of Applicant's electric utility plant for the generation of electric power and energy. They will include one pressurized water reactor to be temporarily known as "Russellville Nuclear Unit." It is expected that the unit will be capable of an ultimate output of 2,584 mwt (including 16 mwt contribution from reactor coolant pumps). The corresponding net electrical capability has not yet been determined because the specific design of the turbine-generator has not been fixed. It is expected that the Facilities will have a capability of 850 mwe at initially licensed power and 880 mwe ultimately. All physics

and core thermal hydraulics information in the attached Preliminary Safety Analysis Report is based upon the reference core design of 2452 mwt. Site parameters, principal structures, engineered safeguards, and the hypothetical accidents evaluated are for the expected ultimate output of 2,568 mwt from the reactor core.

f. Financial Qualifications of Applicant

Applicant estimates that the total cost of the Facilities, including the initial core for the unit, will be approximately \$169,000,000. This amount was determined on the bases of firm prices quoted by The Babcock & Wilcox Company for the nuclear steam supply system and for the initial fuel and estimates for the balance of plant. This total amount is made up of the following:

(a) Total nuclear production plant costs, including land	\$138,000,000.00
(b) Transmission, distribution and general plant costs	7,000,000.00
(c) Nuclear fuel inventory cost for first core	<u>24,000,000.00</u>
Total estimated cost	\$169,000,000.00

The Applicant intends to purchase its fuel for the first core.

Construction of the Facilities will be financed as an integral part of Applicant's total construction program.

Applicant's public financing and securities rating is based on its own financial structure. A substantial part of the funds required for the construction program will be obtained from retained earnings, provisions for depreciation, and other internal sources. The remainder of the required funds will be obtained from time to time from temporary short-term borrowings from banks and from the sale and issuance of securities.

Applicant has lines of credit from commercial banks for short-term borrowings at the prime commercial interest rate. From time to time the short-term borrowings will be repaid and additional funds obtained through the sale of Applicant's securities. Due to changing market conditions, no definite statement can be made at this time as to the type of securities which will be sold or the dates of their sale. It is presently anticipated that Applicant will issue and sell long-term debt and equity securities during the period of construction of the Facilities in a manner consistent with the maintenance of desirable capitalization ratios.

In recent years, all of the issues of Applicant's First Mortgage Bonds have been rated A by Moody's and by Standard & Poor's. None of Applicant's outstanding bonds mature prior to 1974.

Information relating to the financial qualifications of Applicant to engage in the proposed activities is contained in Exhibit I attached hereto. Included in this Exhibit are financial statements of Applicant as of July 31, 1968. Additional financial and statistical information is shown in Applicant's 1966 and 1967 annual reports to shareholders, which are attached hereto as Exhibit II.

Applicant will carry builders' risk insurance during the construction of the Facilities and charge the cost thereof to construction expenditures. Applicant will also obtain all required and appropriate property and liability insurance for the Facilities and their nuclear fuel, and will advise the Commission accordingly.

g. Technical Qualifications of Applicant.

The personnel in Applicant's Engineering Department will supervise the design and construction of the Facilities, and will operate the Facilities after completion. The nuclear-steam supply system (including reactor, primary loops and steam generators, miscellaneous systems, instrumentation and controls, and supporting technical services) for the unit, as well as initial fuel requirements and assistance in training, will be supplied by The Babcock & Wilcox Company.



Bechtel Corporation, as architect-engineer, will design the other portions of the Facilities, and will procure all other materials, equipment and supplies for the construction of the Facilities, subject to instructions from and approval by the Applicant. Bechtel Corporation will also manage the construction of the Facilities, including the making of quality control and compliance inspections. The actual construction of the Facilities will be by Bechtel Corporation or by other independent contractors working under the management of Bechtel Corporation. Quality control and compliance inspections, in addition to those made by Bechtel Corporation, will be arranged for by Applicant.

The technical qualifications of Applicant to engage in the proposed activities are described in Exhibit III which is attached hereto. Also included in Exhibit III are the technical qualifications of The Babcock & Wilcox Company and of Bechtel Corporation.

h. Completion Dates.

Applicant's projected load requirements will necessitate normal power generating operation of the unit no

later than December 31, 1972. The earliest date for completion of construction (ready for fuel loading) is estimated to be February 1, 1972, and the latest such completion date is estimated to be July 1, 1972.

1. Restricted Data.

An agreement limiting access to Restricted Data as required by 10 CFR §50.37 is attached hereto as Exhibit IV. This application in the form submitted does not contain restricted data or other defense information. It is requested that all communications pertaining to this application be sent to:

J. D. Phillips  
Vice President and Chief Engineer  
Arkansas Power & Light Company  
Sixth and Pine Streets  
Pine Bluff, Arkansas 71601

IN WITNESS WHEREOF, Arkansas Power & Light Company has caused its name to be hereunto signed by William McCollam, Jr., its Senior Vice President, and its corporate seal to be hereto affixed by A. B. Coen, its Secretary, this 24th day of November, 1967.

ARKANSAS POWER & LIGHT COMPANY

By: William McCollam, Jr.  
Senior Vice President

ATTEST:

A. B. Coen  
Secretary









ARKANSAS POWER & LIGHT COMPANY  
FINANCIAL STATEMENTS

Arkansas Power & Light Company's fiscal accounting is on the calendar year basis. The financial statements, submitted herewith, include balance sheets as of December 31, 1967 and July 31, 1968, and statements of income and earned surplus for the last five calendar years and the most recent twelve months ended July 31, 1968. The notes to financial statements are an integral part of these statements.

ARKANSAS POWER & LIGHT COMPANY  
BALANCE SHEETS

EXHIBIT I  
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<u>ASSETS</u>	<u>December 31,</u> <u>1967</u>	<u>July 31,</u> <u>1968</u>
Electric Utility Plant:		
Electric utility plant (at original cost)	\$ 547,755,239	\$ 572,759,200
Plant acquisition adjustments-unamortized portion	852,118	710,098
Less: Accumulated provision for depreciation of electric plant	<u>108,113,927</u>	<u>115,368,324</u>
Electric utility plant less accumulated provision for depreciation	440,493,430	458,100,974
Other Property and Investments:		
Non-utility property	618,227	608,442
Accumulated provision for depreciation of non-utility property	293,339 CR.	294,187 CR.
Investment in associated company	17,000	17,000
Other investments (at cost)	280,061	264,450
Special funds	<u>115,620</u>	<u>155,222</u>
Total other property and investments	737,569	750,927
Current and Accrued Assets:		
Cash	4,613,876	5,464,717
Special deposits for interest, etc.	182,961	593,382
Working funds	114,705	112,440
Notes receivable	2,595,808	2,921,538
Accumulated provision for uncollectible notes	42,820 CR.	42,820 CR.
Accounts receivable:		
Customer	6,492,832	8,731,332
Affiliates	17,112	111
Other	118,512	127,551
Accumulated provision for uncollectible accounts	130,383 CR.	130,383 CR.
Materials and supplies (at average cost)	4,165,312	3,842,708
Prepayments	483,976	779,676
Other current and accrued assets	359,563	309,418
Total current and accrued assets	<u>18,971,454</u>	<u>22,709,670</u>
Deferred Debits:		
Advance to gas supplier for construction	349,282	320,176
Unamortized debt discount and expense	109,621	93,069
Other	269,850	280,473
Total deferred debits	<u>728,753</u>	<u>693,718</u>
Total	<u>\$ 460,931,206</u>	<u>\$ 482,255,289</u>

See accompanying Notes to Financial Statements

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ARKANSAS POWER & LIGHT COMPANY  
BALANCE SHEETS

EXHIBIT I  
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<u>LIABILITIES</u>	<u>December 31,</u> <u>1967</u>	<u>July 31,</u> <u>1968</u>
Proprietary Capital:		
Preferred stock, cumulative, \$100 par value		
4.32% authorized and outstanding 70,000 shares	\$ 7,000,000	\$ 7,000,000
4.72% authorized and outstanding 93,500 shares	9,350,000	9,350,000
4.56% authorized and outstanding 75,000 shares	7,500,000	7,500,000
4.56% (1965 series) authorized and outstanding 75,000 shares	7,500,000	7,500,000
6.08% authorized and outstanding 100,000 shares	10,000,000	10,000,000
Premium on preferred stock	136,738	136,738
Common stock and earned surplus:		
Common, \$12.50 par value; authorized 1967, 10,000,000 shares; 1968, 20,000,000 shares; outstanding: 1967, 8,220,000 shares; 1968, 8,910,000 shares	102,750,000	111,375,000
Earned surplus (See Note 1)	<u>27,056,739</u>	<u>20,991,913</u>
Total proprietary capital	<u>171,293,477</u>	<u>173,853,651</u>
Long-Term Debt:		
First mortgage bonds:		
3-1/8% series due 1974	30,000,000	30,000,000
2-7/8% series due 1977	11,000,000	11,000,000
3-1/8% series due 1978	7,500,000	7,500,000
2-7/8% series due 1979	8,700,000	8,700,000
2-7/8% series due 1980	6,000,000	6,000,000
3-5/8% series due 1981	8,000,000	8,000,000
3-1/2% series due 1982	15,000,000	15,000,000
3-1/4% series due 1984	7,500,000	7,500,000
3-3/8% series due 1985	18,000,000	18,000,000
4-7/8% series due 1991	12,000,000	12,000,000
4-3/8% series due 1993	15,000,000	15,000,000
4-5/8% series due 1995	25,000,000	25,000,000
5-3/4% series due 1996	25,000,000	25,000,000
5-7/8% series due 1997	30,000,000	30,000,000
7-3/8% series due 1998		15,000,000
3-3/8% sinking fund debentures	5,600,000	5,375,000
Total long-term debt	<u>224,300,000</u>	<u>239,075,000</u>
 Total capitalization	 \$ <u>395,593,477</u>	 \$ <u>412,928,651</u>

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ARKANSAS POWER & LIGHT COMPANY  
BALANCE SHEETS

EXHIBIT I  
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<u>LIABILITIES (Cont'd)</u>	<u>December 31,</u> <u>1967</u>	<u>July 31,</u> <u>1968</u>
Current and Accrued Liabilities:		
Notes payable to banks	\$ 2,500,000	\$ 4,500,000
Accounts payable:		
Affiliates	1,014,205	904,918
Other	4,143,016	4,065,999
Customer deposits	3,120,771	3,265,749
Taxes accrued	10,624,398	10,407,531
Interest accrued	2,966,908	3,755,128
Dividends declared	508,930	
Tax collections payable	548,548	788,826
Other current and accrued liabilities	131,103	111,600
Total current and accrued liabilities	<u>25,557,879</u>	<u>27,799,751</u>
Deferred Credits:		
Unamortized premium on debt	803,209	851,794
Customer advances for construction	327,306	314,693
Accumulated deferred investment tax credit (See Note 2)	5,602,217	5,886,537
Other deferred credits	399,719	328,729
Total deferred credits	<u>7,132,451</u>	<u>7,381,753</u>
Operating Reserves:		
Property insurance reserve	578,171	432,936
Injuries and damages reserve	107,417	107,417
Pensions and benefits reserve	960,329	898,085
Total operating reserves	<u>1,645,917</u>	<u>1,438,438</u>
Contributions in Aid of Construction	<u>3,186,472</u>	<u>3,321,686</u>
Accumulated Deferred Income Taxes (See Note 2)	<u>27,815,010</u>	<u>29,385,010</u>
Commitments (See Note 3)		
Total	<u>\$ 460,931,206</u>	<u>\$ 482,255,289</u>

See accompanying Notes to Financial Statements

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ARKANSAS POWER & LIGHT COMPANY

EXHIBIT I

STATEMENT OF INCOME

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	Twelve Months Ended					
	December 31,					July 31,
	1963	1964	1965	1966	1967	1968
	(Thousands of Dollars)					
Operating Revenues	\$ 79,824	\$ 86,996	\$ 93,898	\$ 99,752	\$ 107,944	\$ 114,003
Operating Expenses:						
Operation:						
Power purchased	4,844	6,233	7,537	10,918	17,091	14,513
Other production, transmission and distribution	15,879	17,016	18,318	17,751	15,436	17,767
Customer accounting and sales expense	3,957	4,123	4,554	4,604	4,700	4,869
Administrative and general	5,003	5,944	5,916	6,061	6,261	7,177
Total operation	29,683	33,316	36,325	39,334	43,488	44,326
Maintenance	4,093	4,518	4,398	4,522	4,786	4,965
Provisions for depreciation	10,251	10,406	11,256	12,212	12,970	14,255
Taxes--other than income	5,631	5,785	6,315	7,361	8,312	8,785
Provisions for income taxes (See Note 2):						
Federal	10,329	11,716	10,377	10,754	7,906	9,941
State	1,027	1,279	1,241	1,223	1,248	1,347
Deferred income taxes--net	1,229	1,176	1,369	1,638	2,236	2,510
Investment tax credit adjustments--net (See Note 2)	408	393	1,326	680	2,422	1,706
Total operating expenses	62,651	68,589	72,607	77,724	83,368	87,830
Operating Income	17,173	18,407	21,291	22,028	24,576	26,173
Other Income	291	338	487	499	460	276
Total Income	17,464	18,745	21,778	22,527	25,036	26,449
Miscellaneous Income Deductions:						
Amortization of electric plant acquisition adjustments	243	243	243	243	243	243
Other	120	198	133	174	133	179
Total miscellaneous income deductions	363	441	376	417	376	422
Income Before Interest Charges	17,101	18,304	21,402	22,110	24,660	26,027
Interest Charges:						
Interest on mortgage bonds	4,849	4,818	5,644	7,140	8,783	9,242
Interest on debentures	219	219	208	203	193	188
Amortization of discount and premium on debt (net)	548	55	50	46	41	3
Other interest	124	217	189	447	398	501
Interest charged to construction	92 CR.	371 CR.	911 CR.	1,425 CR.	3,039 CR.	1,945 CR.
Total interest charges--net	5,648	4,938	5,180	6,411	6,376	7,999
Net Income	\$ 11,453	\$ 13,366	\$ 16,222	\$ 15,699	\$ 18,284	\$ 18,038

See accompanying Notes to Financial Statements

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ARKANSAS POWER & LIGHT COMPANY  
STATEMENT OF EARNED SURPLUS

EXHIBIT I  
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	Twelve Months Ended					July 31, 1968
	December 31,					
	1963	1964	1965	1966	1967	
	(Thousands of Dollars)					
Balance at Beginning of Period	\$18,534	\$18,608	\$17,947	\$21,246	\$23,765	\$24,363
Net Income	11,453	13,367	16,222	15,699	18,284	18,038
Profit on Sales of Physical Property	5	—	—	—	—	—
Total	<u>29,992</u>	<u>31,975</u>	<u>34,169</u>	<u>36,945</u>	<u>42,049</u>	<u>42,401</u>
Deduct:						
Expenses in connection with issuances of preferred stock		43	29			
Net premium and expense on redemption of 5.48% preferred stock			427			
Dividends--cash:						
4.32% preferred stock	302	302	302	302	302	302
4.72% preferred stock	441	441	441	441	441	441
5.48% preferred stock	411	411	157			
4.56% preferred stock		59	342	342	342	342
4.56% preferred stock (1965 series)			244	342	342	342
6.08% preferred stock				112	608	608
Common stock (\$1.16 per share for 1963, 1964 and 1965; \$1.17 per share for 1966; \$1.22 per share for 1967; \$1.28 per share for twelve months ended July 31, 1968)	7,230	7,772	7,981	8,641	9,957	10,749
Transfer to common stock account (represents \$12.50 par value of shares issued as follows: 240,000 shares in 1963; 400,000 shares in 1964; 240,000 shares in 1965, 1966 and 1967 respectively; and 690,000 shares in 1968)	<u>3,000</u>	<u>5,000</u>	<u>3,000</u>	<u>3,000</u>	<u>3,000</u>	<u>8,625</u>
Total	<u>11,384</u>	<u>14,028</u>	<u>12,923</u>	<u>13,180</u>	<u>14,992</u>	<u>21,409</u>
Balance at Close of Period (See Note 1)	<u>\$18,608</u>	<u>\$17,947</u>	<u>\$21,246</u>	<u>\$23,765</u>	<u>\$27,057</u>	<u>\$20,992</u>

## NOTES TO FINANCIAL STATEMENTS

FOR THE FIVE YEARS ENDED DECEMBER 31, 1967 AND

THE TWELVE MONTHS ENDED JULY 31, 1968

1. Various restrictions on the payment of cash dividends or other distributions on common stock and on the purchase of Company common stock are contained in the indentures underlying the Company's mortgage bonds and sinking fund debentures and in the Company's articles of incorporation, as amended. At December 31, 1967, \$8,620,978, and at July 31, 1968, \$3,720,526 of the earned surplus was restricted under the bond indenture provisions which were then most restrictive.
2. Provisions for current Federal and State income taxes reflect net reductions attributable to the recognition of accelerated amortization and liberalized depreciation, for tax purposes only, in advance of the periods in which depreciation would otherwise be deductible in computing such taxes. Provisions have been made for deferred income taxes in amounts equivalent to such net reductions. Provision for current Federal income tax has also been reduced by the investment tax credit. An amount equivalent to such reduction has been deferred by a charge to income and the deferred amount is being amortized over the average useful life of the related property. The investment tax credits for 1967 and 1968 were \$2,566,369 and \$1,897,369, respectively; the amounts credited to income were \$144,815 in 1967 and \$191,223 in 1968.
3. The Company's construction program contemplates expenditures of approximately \$52,000,000 in 1968. Included in this amount is \$17,000,000 for a power plant expected to be completed in 1969 at a total cost of \$41,000,000. Also, the Company has entered into a contract for the design and construction of a nuclear power unit scheduled for completion in 1972. In connection therewith it has issued letters of intent for various components of the unit. The total construction cost of the entire unit is presently estimated at \$140,000,000.
4. In January 1966, the Federal Power Commission issued a Notice of Proposed Rulemaking relating to the determination of the "net investment" in hydroelectric projects licensed by that commission. The extent to which any such rule, if adopted, would affect the Company's current net investment of about \$5,100,000 in its licensed projects is not presently ascertainable.
5. The Company has a pension plan which covers employees of age 30 to 65 who have completed one year of service. Both the Company and employees make contributions under the plan for the cost of benefits accruing on current service. The provision for the Company's current service cost in 1967 amounted to \$506,412; additionally, \$106,704 was funded for prior service cost by a charge to the reserve for pension benefits. The prior service costs are being funded by charges to this reserve over a ten-year period. The total assets of the plan as of December 31, 1966 exceeded the liabilities for vested benefits, and there have been no significant changes since that date.

6. The Company is a defendant in claims arising from disputes on contract performance in connection with its construction program. In one case the Company has filed a counterclaim substantially in excess of the amount for which it has been sued. In the opinion of counsel, the claims against the Company are substantially overstated and the ultimate liability of the Company, if any, will not be material.





TECHNICAL QUALIFICATIONS

1 ARKANSAS POWER & LIGHT COMPANY - TECHNICAL QUALIFICATIONS

1.1 GENERAL

Arkansas Power & Light Company has over 45 years experience in the design, construction and operation of electric generating plants. Personnel of the Engineering Department of the Company have supervised and made final decisions on the design and construction of its generating plants. It has been the practice of the Company, however, to retain independent engineers to design and manage the construction of its generating plants under the supervision of the Company's engineers. The Production Department, which is a part of the Engineering Department of the Company, operates all of the generating plants with its personnel.

On November 1, 1967, Arkansas Power & Light Company operated five steam electric generating plants containing a total of 11 units with a net capability of 1,109,000 kilowatts, two hydroelectric stations with a capability of 69,000 kilowatts and diesel generating units with a total capability of 6,000 kilowatts, for a total net electric generating capability of 1,184,000 kilowatts. At the present time the Company is constructing two additional generating units. Installation of Unit No. 2, a 550,000 kilowatt gas-fired generating unit, is scheduled for completion in December, 1967, at the Robert E. Ritchie Steam Electric Generating Station. Unit No. 4 at the Lake Catherine Steam Electric Generating Station, a 530,000 kilowatt gas-fired unit, is scheduled to be completed in 1969.

1.2 PARTICIPATION IN NUCLEAR PROJECT ACTIVITIES

In 1957, Arkansas Power & Light Company, along with other utility companies, organized Southwest Atomic Energy Associates for the purpose of conducting research in nuclear fuels. Beginning in 1957, SAEA sponsored a research and development program conducted by Atomic International Division of North American Aviation, Inc. to develop information in a critical facility in the middle (epi-thermal) neutron energy region in uranium thorium nuclear fuel. This project was completed in 1963.

In 1963, SAEA agreed to enter into a new research project for the purpose of investigation of an uranium-plutonium oxide fuel in a fast neutron energy environment. SAEA has joined with General Electric Company,

the Atomic Energy Commission and the Karlsruhe Research Center of the Federal Republic of West Germany to build and operate the Southwest Experimental Fast Oxide Reactor Facility near Fayetteville, Arkansas, to carry out this research and development program. The facility is presently under construction and is expected to begin operations in May, 1968.

In 1967, SAEA, along with other utility companies, agreed to participate in a cost study to be made by General Electric Company for preliminary design of a proto-type fast breeder plant of 300,000 kilowatts capacity.

Mr. Reeves E. Ritchie, President of Arkansas Power & Light Company, and Mr. J. D. Phillips, Vice President of the Company, have served and are currently serving as trustee and member of the Technical Committee, respectively, of SAEA. Mr. Robert J. Wimberley, Manager of Communications of Arkansas Power & Light Company, is a Past Chairman and presently Vice Chairman and member of the Steering Committee of the Public Relations Committee of SAEA, and in those capacities has been primarily responsible for the public relations program on SEFOR in Arkansas. Several of the officers and engineers of Arkansas Power & Light Company have attended meetings of the Board of Trustees and of various committees of SAEA and of the Trustees of the SEFOR project; have participated in studies of the projects considered and undertaken by SAEA; have visited and studied the research programs in which SAEA has participated; and have regularly reviewed reports of research programs in which SAEA was and is a participant.

In 1958, Arkansas Power & Light Company joined 52 other utility companies in organizing High Temperature Reactor Development Associates, Inc. and has been a participant in that organization and its activities continuously since. HTRDA sponsors the operation at Peach Bottom, Pennsylvania, of a developmental proto-type of the high temperature, gas-cooled, graphite-moderated nuclear reactor system conceived and developed by General Atomic Division of General Dynamics Corporation. Reeves E. Ritchie, President of Arkansas Power & Light Company, is a trustee of HTRDA. Arkansas Power & Light Company engineers have followed and studied this project and continue to regularly review reports issued by HTRDA.

Arkansas Power & Light Company has been a regular contributor to the General Atomic's fuel and fuel-cycle development program, in association with the

high temperature gas-cooled reactor. The Company is also a contributor to and participant in the Southern Interstate Nuclear Board and the Atomic Industrial Forum. From time to time the Company's officers and engineers have participated in meetings and programs of these organizations.

### 1.3 QUALIFICATIONS OF KEY OFFICERS

Mr. Reeves E. Ritchie, President and Chief Executive Officer, has been continuously employed by Arkansas Power & Light Company since December, 1936. Mr. Ritchie has worked in various jobs in the Company's production plants, including the position of Assistant Plant Superintendent. He has served as Assistant to the Division Manager in the Operating Department, Vice President in Charge of Personnel and Executive Vice President. He was elected to his present position in 1962. He is a member of the Board of Directors of Arkansas Power & Light Company and of Middle South Utilities, Inc. He is a Director and past President of the Southeastern Electric Exchange. Mr. Ritchie has served as a Trustee of Southwest Atomic Energy Associates since 1962, and is now serving as Vice President of this organization. In this capacity, he has attended numerous conferences and meetings on nuclear power. He has followed the organization of the SEFOR research and development program since its inception. He is a Trustee of HTRDA and in that capacity receives regular reports of the program of that organization.

Mr. William McCollam, Jr., is Senior Vice President and a Director of Arkansas Power & Light Company. He is responsible through certain department heads for the physical operations of Arkansas Power & Light Company. Mr. McCollam is a graduate of Louisiana State University with the degree of Bachelor of Science received in 1943, and of the United States Military Academy with a degree of Bachelor of Science in Military Engineering received in 1946. In addition, he received the degree of Master of Science in Civil Engineering from Massachusetts Institute of Technology in 1954. He is a former Lieutenant Colonel in the Corps of Engineers, United States Army. While in the Corps, he completed several engineering officer's courses. In July, 1958, Mr. McCollam became an Instructor and Assistant Professor of Civil Engineering in the Department of Military Art and Engineering at



the United States Military Academy. He later became an Associate Professor of Civil Engineering and Department Executive Officer at the same school, where he taught until he joined Arkansas Power & Light Company in September, 1961. Since 1961, he has served as Executive Assistant to the President, Vice President, and, since June, 1967, as Senior Vice President. Mr. McCollam is a registered professional engineer in the State of New York.

Mr. J. D. Phillips is Vice President and Chief Engineer of Arkansas Power & Light Company and is directly responsible for the design and construction of its production facilities and transmission and distribution systems and for the operation of its generating and transmission facilities. He graduated from Mississippi State University in 1941 with a degree of Bachelor of Science in Electrical Engineering. Mr. Phillips is a registered professional engineer in both Mississippi and Arkansas. He is a member of the National Society of Professional Engineers, the Arkansas Society of Professional Engineers and the Institute of Electrical and Electronic Engineers. Mr. Phillips has been in the Middle South Utilities, Inc. organization in various positions since 1946, having spent 17 years with the Mississippi Power & Light Company before joining Arkansas Power & Light Company as Assistant Chief Engineer in 1963. Under Mr. Phillips' supervision in the Engineering Department is a staff of 28 graduate engineers, any of whom may be used in specific areas in the construction of the Russellville Nuclear Unit. Mr. Phillips is a member of the Technical Committee of Southwest Atomic Energy Associates. He participated in the studies leading to the SEFOR project and in the planning of that project. He has kept himself informed as to all phases of this project through



attendance at meetings, review of periodic reports and visits to the site. He has served as the Company representative at meetings of the Southern Interstate Nuclear Board. He regularly reviews reports from High Temperature Reactor Development Associates, Inc. He has followed and participated in all of the nuclear projects in which the Company has been a participant and to which it has been a contributor. He directly supervised and participated in the study which led to the decision of the Company to construct the Russellville Nuclear Unit and has actively participated in the planning of this generating plant.

1.4 TECHNICAL QUALIFICATIONS OF KEY ENGINEERS

Mr. R. W. Toler, Jr., Assistant Chief Engineer of the Arkansas Power & Light Company, was graduated from the University of Arkansas in 1947 with a Bachelor of Science degree in Electrical Engineering. He is a registered professional engineer in Arkansas, and a member of the National Society of Professional Engineers, the Arkansas Society of Professional Engineers, and the Institute of Electrical and Electronic Engineers. Mr. Toler began to work for Arkansas Power & Light Company in February of 1947 as an Electrical Engineer, and has been employed by the Company since that date as Electrical Engineer, Manager of Research and Design and, since May, 1967, as Assistant Chief Engineer. Mr. Toler has been active in the evaluation studies for the Russellville Nuclear Unit and will be primarily responsible for the electrical design and layout work in the plant.

Mr. Filly E. Green is an Engineer in the Long-Range Planning Department of the Engineering Department of Arkansas Power & Light Company. He is a 1959 graduate of the University of Arkansas, where he was awarded a degree of Bachelor of Science in Electrical Engineering. He is a registered professional engineer in the State of Arkansas, and is a member of the National Society of Professional Engineers, the Arkansas Society of Professional Engineers and the Institute of Electrical and Electronic Engineers. Mr. Green has attended the NUS Fuel Management Course. He has attended meetings of the Southern Interstate Nuclear Board as a representative of the Company and has kept himself advised as to the activities of that organization. He has attended sessions of the Atomic Industrial Forum as a representative of the Company and has kept himself advised as to the activities of that organization. He has engaged in

extensive informal study in the field of nuclear engineering. He participated in the evaluation study of the Company which led to the decision to construct the Russellville Nuclear Unit and has followed the planning for that unit. He has continuously followed and kept himself advised on the SEFOR project.

Mr. James E. Bentley, Jr., Manager of Safety of Arkansas Power & Light, was graduated from the University of Arkansas in 1958 with a Bachelor of Science degree in Industrial Management. He is a member of the American Society of Safety Engineers, Edison Electric Institute Accident Prevention Committee serving on Protective Equipment Subcommittee, Southeastern Electric Exchange Accident Prevention Committee serving as Secretary. He is past chairman of the Utilities Section of the Southern Safety Conference and is the Company representative in the Utilities Section of the National Safety Council. Mr. Bentley has worked for Arkansas Power & Light as laborer, clerk, junior draftsman and groundman in the Stores, Engineering and Line Construction and Maintenance sections of the operating department as a temporary summer employee from 1949 to 1957. He began work as a regular full-time employee for the Company in June of 1958 as an Industrial Sales Engineer, and has been employed by the Company since that date as Industrial Sales Engineer, Personnel Administrative Assistant - Safety Section, Safety Coordinator, and since July 1967, Manager of Safety. He has been working in the Safety Section of the Company since August 1961 and has had the staff responsibility for accident prevention in the Company since July 1964. He has completed the one-week Civil Defense Radiation Monitoring for Instructors Course at the State College of Arkansas in cooperation with the State of Arkansas Executive Office of Civil Defense and Disaster Relief. He has engaged in extensive informal study in the field of radiation safety by attending meetings of the EEI Radiation Safety Task Force and others on this subject, and has visited a commercial nuclear electric generating station and discussed radiation safety with station operating personnel. He has continuously followed and kept himself advised on the Company's nuclear activities. Mr. Bentley will be actively engaged in the

work of the Russellville Nuclear Unit Safety Review Committee and will have normal Company staff responsibility for accident prevention at the plant.

1.5 TECHNICAL QUALIFICATIONS OF ARKANSAS POWER & LIGHT COMPANY'S PRODUCTION DEPARTMENT STAFF

The Production Department of Arkansas Power & Light Company is a part of the Engineering Department of the Company. The Production Department under the supervision of the Vice President, Engineering, and the Vice President and Chief Engineer is responsible for the design, construction and operation of all generating plants of the Company, including the Russellville Nuclear Unit.

Mr. John P. White, Manager of the Production Department, graduated from the University of Arkansas in 1928 with a degree of Bachelor of Science in Electrical Engineering. Mr. White has been with the Arkansas Power & Light Company since May, 1943, serving as Assistant Power Plant Superintendent, Power Plant Superintendent, and since 1949, as Manager of the Production Department. Mr. White is a registered professional engineer in Arkansas, a member of the Arkansas Society of Mechanical Engineers and a member of the EEI Prime Movers Committee. Through studies, reports and meetings, Mr. White has kept himself advised as to all nuclear projects in which the Company has been a participant or to which it has been a contributor, including the Atomics International Project of SAEA, the SEFOR project, and the Peach Bottom project sponsored by High Temperature Reactor Development Associates, Inc. He has participated actively in the evaluation studies made by the Company of nuclear power and the planning for the Russellville Nuclear Unit.

Mr. J. H. Woodward, Assistant Manager of the Production Department, is responsible for the operation and maintenance of the present generating facilities of the Company. Mr. Woodward has been with the Company since 1946, having held various operating jobs within the generating plants, and having been Plant Superintendent of two of the Company's generating stations before being promoted to his present position in 1965. Mr. Woodward is a member of the American Society of Mechanical



Engineers. He has actively participated in the evaluation studies for the Russellville Nuclear Unit and has been engaged in the planning for this unit. In preparing himself for this work he has visited and studied nuclear generating plants and has consulted with the operating personnel at these plants.

Mr. Harlan T. Holmes, Assistant Manager of the Production Department, has been designated by Arkansas Power & Light Company as Nuclear Project Manager. As Nuclear Project Manager, Mr. Holmes is responsible for coordinating and directing the activities for the Russellville Nuclear Unit, including engineering, design, construction, licensing and initial operation.

Mr. Holmes is a graduate of the University of Arkansas with degrees of Bachelor of Science in Mechanical Engineering in 1944 and Bachelor of Science in Electrical Engineering in 1947. He has continued post graduate work in Nuclear Engineering at the University of Arkansas' Graduate Institute of Technology in Little Rock.

Mr. Holmes' duties have involved supervision of various stages of generating plant design, construction and operation. These include three existing fossil-fueled electric generating additions and the two new units of the Company presently under construction. Mr. Holmes is a member of the Edison Electric Institute's Committee on Nuclear Fuels and has worked with this group in preparation of a plutonium survey and development of studies on plutonium recycle in thermal reactors. He has participated in the Arkansas Power & Light Company Nuclear Power Design Studies and has attended the Westinghouse two-week Short Course on Nuclear Power. Since 1957, Mr. Holmes has closely followed and kept himself informed through studies, review of reports, meetings, conferences and visits and inspections at the sites on all of the nuclear projects in which Arkansas Power & Light Company has been a participant or to which it has been a contributor including the Peach Bottom Project sponsored by High Temperature Reactor Development Associates, Inc., the Atomics International project sponsored by SAEA and the SEFOR project. He has actively participated in all evaluation studies made by the Company of the feasibility

of nuclear generating plants and the design of the Russellville Nuclear Unit. He has participated actively in all planning activities for the Russellville Nuclear Unit and since July, 1967, has devoted substantially full time to these activities. Mr. Holmes is a member of the American Society of Mechanical Engineers, the Institute of Electrical and Electronic Engineers, American Nuclear Society, Atomic Industrial Forum (Company alternate representative), EEI Plutonium Task Force, and is a registered professional engineer in the State of Arkansas.

Mr. Roger Bottoms, Engineer in the Mechanical Section of the Production Department of Arkansas Power & Light Company, is a graduate of Vanderbilt University with a Bachelor of Engineering in Mechanical Engineering in 1950. He also received a Master of Science degree in Power and Fuel Engineering from Virginia Polytechnic Institute in 1951. Mr. Bottoms has been with Arkansas Power & Light Company since 1951 and has worked in generating plants in managerial positions since 1953. In July, 1967, he was transferred to the General Office to devote full time to the Russellville Nuclear Unit. Since then he has been actively engaged in planning for this unit.

Mr. G. Harvey Miller, Engineer in the Mechanical Section of the Production Department of Arkansas Power & Light Company, is a 1960 graduate of the University of Arkansas, with a Bachelor of Science degree in Mechanical Engineering. He has done some post-graduate work in Nuclear Engineering at the University of Arkansas' Graduate Institute of Technology in Little Rock. Mr. Miller has been with Arkansas Power & Light Company since 1962, with most of his experience being as Results Engineer in the generating plants. In September of this year, he was transferred into the General Office to be available for work on the Russellville Nuclear Unit. He is now devoting full time to the planning for this unit. Mr. Miller is a member of the American Society of Mechanical Engineers and is an Engineer-in-Training for Professional Engineer in Arkansas.



Mr. John W. Anderson, Engineer in the Mechanical Section of the Production Department, is a 1949 graduate of Ouachita Baptist University with a Bachelor of Science Degree in Chemistry. He has done post graduate work in Nuclear Engineering in the University of Arkansas Graduate Institute of Technology. Mr. Anderson has been with Arkansas Power & Light Company in power plants since 1949. In 1955 he assumed the position of Results Engineer and Assistant Plant Superintendant in 1960. In August, 1968, Mr. Anderson was transferred from Robert E. Ritchie Steam Electric Station, a super-critical pressure plant of 906mw, to the General Office to devote full time to the Russellville Nuclear Unit. Since then he has been actively engaged in planning the nuclear unit. Mr. Anderson is a member of the American Society of Mechanical Engineers. He participated in the Nuclear Power Familiarization Program sponsored by Arkansas Power & Light Company.

It is planned that additional engineers will be assigned to the Russellville Nuclear Unit as they may be needed. The operation of the Russellville Nuclear Unit will necessitate operating, maintenance and technical groups headed by plant supervisors. All of these positions have not yet been filled. It is presently planned that the plant staff, except for certain technical positions, will be chosen from the most experienced operating personnel in existing generating plants of Arkansas Power & Light Company, and that they will receive nuclear engineering and operation training necessary to be licensed as required by the Atomic Energy Commission. Section 12 of the PSAR gives complete information on plant staff organization and qualifications.

1.6 TECHNICAL QUALIFICATIONS OF MIDDLE SOUTH SERVICES, INC. STAFF

Arkansas Power & Light Company is a subsidiary of Middle South Utilities, Inc. Another subsidiary of Middle South Utilities, Inc. is Middle South Services, Inc. This latter corporation has been created by Middle South Utilities, Inc. to provide consulting services and assistance to its four operating subsidiaries in various technical fields. The employees and consultants of Middle South Services, Inc. are available to Arkansas Power & Light Company to the extent they may be needed. Arkansas Power & Light Company has utilized the services of some of the Middle South Services, Inc. staff in planning for the Russellville Nuclear Unit and will continue to use those services in the licensing, design, construction and operation of the Russellville Nuclear Unit.

Mr. William M. Brewer, Jr., Vice President-Engineering of Middle South Services, Inc., is available to the Arkansas Power & Light Company for this project. Mr. Brewer was graduated from the University of Tennessee in 1936, with a Bachelor of Science in Electrical Engineering. He is a registered professional engineer in Arkansas and a member of the Institute of Electrical and Electronic Engineers. He began work for Arkansas Power & Light Company in August, 1940. He continued with Arkansas Power & Light Company until August, 1963, when he transferred to Middle South Services, Inc. as Vice President - Engineering. During his career with the Arkansas Power & Light Company he was Maintenance Engineer, Relay Engineer, Supervisor of the Carrier and Relay Section, and Manager of Long Range Planning. Mr. Brewer is Middle South Utilities' representative on the Atomic Industrial Forum and has attended seminars in Nuclear Power. He participated actively in evaluation studies on the Russellville Nuclear Unit, the selection of the type of nuclear steam supply to be used, and the negotiation of the contract for this system.

Dr. K. M. Broom, Jr., Nuclear Specialist, Engineering Department, Middle South Services, Inc., is assigned to Arkansas Power & Light Company as consultant on the Russellville Nuclear Unit. Dr. Broom received his BA degree in Chemistry and Mathematics from the University of Southern Mississippi in 1958, and his MS and PhD degrees in Nuclear Chemistry from the University of Arkansas in 1961 and 1963, respectively. From 1963 to 1966, Dr. Broom was employed by Atomics International

Division of North American Aviation, where his responsibilities included supervision of the Radiochemistry and Nuclear Counting Laboratories, Nuclear Fuel Burn-Up Analyses, and Fuel Cycle Studies. In 1966, Dr. Broom joined the United States Atomic Energy Commission, Division of Reactor Development and Technology, Fuels and Materials Branch. At AEC, he was responsible for fast and thermal reactor fuel development and plutonium recycle. Dr. Broom joined Middle South Services, Inc. in 1967. Presently, he is assisting Arkansas Power & Light Company with the economic evaluation and design review of nuclear plants, training programs, and fuel cycle studies. Dr. Broom is a member of the American Nuclear and American Chemical Society, the American Association for Advancement of Science, the National Management Association, Research Society of America, and American Society for Testing and Materials.

#### 1.7 TRAINING

Approximately 29 of Arkansas Power & Light Company's engineering and supervisory personnel will receive 4 sessions of two days each for a total of 8 days or 48 hours of nuclear engineering indoctrination training. This course will be conducted by qualified professors from recognized colleges or the nuclear engineering staff of Babcock & Wilcox Company. The program will consist of basic reactor physics, basic reactor heat transfer and fluid flow, nuclear plant design features and system functions, reactor vessel internals including fuel elements and control rods, steam generators, reactor operation, reactor auxiliary systems, safety analysis, fuel handling, nuclear fuel cycle, instrumentation and controls, normal and emergency power requirements, and precritical startup testing and power operational testing.

A one-day seminar will be presented to all Arkansas Power & Light Company officers and selected management personnel who are not directly involved with nuclear project activities but who must become generally acquainted with the nuclear power project.

All supervisory and operating personnel to be assigned to the Russellville Nuclear Unit will participate in a training program designed to prepare these people for licensing in accordance with the 10 CFR requirements. This program is a cooperative effort to be shared by Arkansas Power & Light Company, The Babcock & Wilcox Company, and the University of Arkansas, or



one of the state colleges. Each will present the portions which it can fulfill most efficiently. The various phases of the program include:

Phase 1 - Theoretical Training - This phase of the program provides a refresher and basic foundation for understanding nuclear engineering and reactor theory. The study program and instructors for this phase can best be provided by utilizing Arkansas Power & Light Company's technical personnel or by arrangement with a convenient college or university. Phase 1 will run for a duration of approximately 20 weeks with 30 hours per week classroom time and will be the responsibility of Arkansas Power & Light Company.

Phase 2 - Nuclear Power Station Training - will be the responsibility of the Arkansas Power & Light Company and will involve sending a selected group of operator trainees to an operating nuclear station for training in operation. The station selected will be similar to the unit for which they will ultimately be licensed. This phase of training requires approximately 3 to 5 months residence time at the operating plant. During this period the trainees will become familiar with the plant and participate in operations to the extent that they are qualified to take an AEC operator's examination. In the event a simulator reactor which is acceptable to AEC is available, the Company may elect to give this phase of training at the simulator site and for the duration of time required to qualify the trainees to take an AEC operator's examination.

Phase 3 - Nuclear Plant Design Characteristics Training - This will be conducted by The Babcock & Wilcox Company at Lynchburg, Virginia, for a period of about two months. It includes instruction and details of design characteristics and operation of the reactor systems furnished by The Babcock & Wilcox Company.

Phase 4 - On the Job Training - This will be managed and supervised by The Babcock & Wilcox Company. After the trainees have completed Phase 3, they will report to the Russellville Nuclear Unit to receive approximately seven months of on-the-job training.

This training program is discussed in detail in Section 12 of the PSAR.

2. THE BABCOCK & WILCOX COMPANY - TECHNICAL QUALIFICATIONS

2.1 GENERAL

The Babcock & Wilcox Company was founded as a partnership in 1867, and organized as a corporation in 1881. B&W is a widely diversified company serving the electric utility, transportation, steel, petroleum, chemical, pulp and paper, and machinery industries, as well as one of the world's leading suppliers of specialty steels. B&W is one of the leading suppliers of components for the nuclear Navy.

The Company ranks as one of the larger American industrial enterprises with corporate total current assets of over \$262,000,000 at the end of 1966. Orders received in 1966 exceeded \$840,000,000 and 1966 income before taxes and minority interests was over \$62,400,000. The backlog at the end of June, 1967, was more than \$1,301,700,000. Current orders for nuclear components, systems and fuel exceed \$500,000,000.

B&W employs over 30,000 persons in facilities throughout the United States, Canada, Great Britain, and Sweden. Of this total, over 1,000 are technical and scientific personnel working in the nuclear power activities.

As the world's largest manufacturer of steam generating equipment, B&W is a recognized leader in the American industrial family. The Company has contributed materially to the development of fundamental materials data, heat transfer data, manufacturing and erection processes, and inspection techniques used in the steam generating equipment industry.

2.2 DIVISIONS AND SUBSIDIARIES

The major Divisions and Subsidiaries of the Company located in the United States, and their products, include:

a. Boiler Division

The Boiler Division designs, manufactures, installs, and services nuclear and conventional steam generating systems and equipment and heavy pressure vessel equipment for the utility, petrochemical, and other industries. The Division designs and manufactures reactor vessels, steam generators, and pressurizers for the nuclear Navy, for



Commercial nuclear power  
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and computers for power

generation, industrial processes, and naval and merchant vessels. Bailey also produces a full line of nuclear instrumentation, incore instrumentation, safety systems, and process instrumentation for use in nuclear power plants.

h. Diamond Power Specialty Company

Diamond Power designs and manufactures boiler cleaning equipment, special gauges, industrial television systems, stud tensioners, and reactor control rod drive mechanisms.

i. Babcock & Wilcox of Canada, Limited

This organization is a major Canadian supplier of steam generators, pumps, and process equipment for a variety of uses in the utility, pulp and paper, and chemical industries. It is also a major Canadian supplier of steam generators for nuclear power plants.

2.3 NUCLEAR EXPERIENCE

B&W's participation in the development of nuclear power dates from the Manhattan project. B&W's nuclear activities are broad and include applied research to develop fundamental data, design and manufacture of nuclear systems components and design and manufacture of complete nuclear steam generating systems.

The major activities and accomplishments in the water-cooled and moderated reactor field are summarized below.

a. Indian Point 1 (Consolidated Edison Company of New York, Inc.)

In 1955, B&W contracted for the development, design, and supply of the nuclear steam system, reactor core, and related control system for Con Edison's Indian Point 1. This unit is a light water-cooled and moderated pressurized water reactor system rated at 585,000 thermal kilowatts. The unit includes a separately fired superheater which heats steam from the reactor system before introduction into a 275,000 kilowatt electric generator. Indian Point 1 went into commercial operation in January, 1963.

b. NS Savannah (USAEC)

B&W was awarded a contract in 1957 to develop, design, and supply the entire propulsion plant for the NS Savannah. B&W's initial contract scope included, in addition to the design and supply of equipment and reactor core, the responsibility for safety analysis work, supervision of propulsion plant equipment erection, crew training, and advice in fuel loading, testing and operation. Through later ancillary contracts, B&W personnel developed and directed the propulsion testing, startup, and initial operational programs.

B&W has continued to supply services in the areas of crew training, upgrading, and operation.

The NS Savannah went into commercial operation in May, 1962, and has been in continuous service since except for a one-year enforced outage resulting from a labor dispute.

The Savannah nuclear steam supply system is a light water-cooled and moderated pressurized water plant rated at 80,000 thermal kilowatts.

c. Advanced Test Reactor (Ebasco/USAEC)

B&W was retained in 1960 as the nuclear subcontractor to Ebasco Services, Inc., for the design of the Advanced Test Reactor. B&W's final scope of work included the design of the nuclear portion of the reactor complex including the reactor core, critical experiments, control rod drives, reactor vessel internals, and fuel handling tools. In addition, B&W was responsible for supervising the research and development programs including corrosion testing, fuel assembly development and heat transfer testing, and the supply of the reactor control rod drive system, as well as the design of inpile test loops. The Advanced

Test Reactor is a light water-cooled and moderated high flux test reactor rated at 250,000 thermal kilowatts.

d. Otto Hahn Power Plant

B&W received in 1960, through its German licensee, Deutsche Babcock & Wilcox, a contract to provide technical and design consultation and assistance on the nuclear steam supply system and reactor core for the German Nuclear Ship, "Otto Hahn". The reactor is an advanced, light water-cooled and moderated, pressurized water reactor in which the core, steam generator, primary pumps, and piping are integrated into a single pressure vessel similar to B&W's Consolidated Nuclear Steam Generator (CNSG). The reactor is rated at 38,000 thermal kilowatts.

e. Oconee Nuclear Station Units 1, 2, and 3 (Duke Power Company)

B&W has a contract to supply three pressurized water nuclear steam supply systems for installation near Seneca, South Carolina. Each system is rated at 2,452 Mwt for a net electrical output of 839 MW. The first unit is scheduled for service in May, 1971, the second in May, 1972, and the third in June, 1973. Each reactor uses chemical shim and control rods for reactivity control, and generates steam with a small amount of superheat in once-through steam generators.

f. Three Mile Island Nuclear Station Unit 1 (Metropolitan Edison Company)

B&W will supply one pressurized water nuclear steam supply system for installation near Harrisburg, Pennsylvania. Initial operation is scheduled for 1971. The unit is rated at approximately 820 MWe (net) and will be a near-duplicate of the units to be supplied for Duke Power Company.



g. Jersey Central and Light Company

B&W will supply one pressurized water nuclear steam supply system for installation at an undisclosed site. Initial operation is scheduled for 1973. The unit is rated at approximately 800 MWe (net) and will be a near-duplicate of the units being supplied for Duke Power Company and Metropolitan Edison Company.

h. Crystal River Station Units 3 and 4  
(Florida Power Corporation)

B&W will supply two pressurized water nuclear steam supply systems for installation near Inverness, Florida. Initial operation of Unit 3 is scheduled for April, 1972, and of Unit 4, mid-1974. Each unit is rated at approximately 840 MWe and will be a near-duplicate of the Duke, Met-Ed, Jersey Central, and Arkansas Power and Light units.

i. Research Reactors

B&W has designed and supplied seven research and test reactors ranging in size from 1,000 to 6,000 thermal kilowatts.

j. Research and Development

B&W's research and development and study efforts are significant and range from development of basic physics and materials data through the development of complete reactor systems including a substantial effort in advanced converter and breeder reactor systems.

2.4 ORGANIZATION

B&W's Boiler Division will execute the Arkansas Power and Light Company contract with active participation by the other Divisions and Subsidiaries.

3. BECHTEL CORPORATION - TECHNICAL QUALIFICATIONS

3.1 GENERAL

The Bechtel Corporation, originated by W. A. Bechtel,

has been continuously engaged in construction or engineering activities since 1898. Bechtel first served industry and government in railroad work; then in highway tunnels, bridges, dams, and pipelines. For the last twenty years Bechtel has been active in the fields of petroleum, power generation and distribution, harbor development, mining and metallurgy, and chemical and industrial processing. The Bechtel organization has grown progressively to be one of the world's largest engineer-constructors for industrial facilities and for development of natural resources. Bechtel Corporation, its affiliates and subsidiaries, are engaged in worldwide engineering and construction projects. The Corporation is divided into eight Operating Divisions. The Power and Industrial Division, which handles nuclear projects, has design offices in San Francisco and Washington. In addition, major design offices are also located in Los Angeles (Vernon), and New York. Bechtel also maintains offices in Houston, Portland, Toronto, Montreal, Paris, The Hague and London.

Since World War II, Bechtel has gained a broad background of experience in providing to the electric industry both engineering and construction services for power generating facilities. During this period Bechtel has completed, or has under design and construction, over 106 units totalling over 38,000,000 kw of thermal generating capacity. This includes more than 13,500,000 kw of central station nuclear power plants utilizing both boiling and pressurized water reactors furnished by all of the major reactor manufacturers in this country. In addition, in the hydroelectric field Bechtel has designed projects totaling over 9,300,000 kw of capacity, which encompass dams of all types and sizes.

The ratings of single thermal generating plants by Bechtel range to over 2,000,000 kw. Included are most types of station design and arrangements such as reheat, non-reheat, combined cycle, indoor and outdoor and single and multiple units. The designs cover a wide range of steam conditions up to 3500 psi, 1050/1000 F. Also, some of the larger units are fully automated and computer controlled.

Over the last five years the average amount of work completed per year by the Bechtel organization was in excess of \$250,000,000; the current annual rate exceeds \$500,000,000. The total cost of engineering and construction of the power plants is in excess of \$1,000,000,000.

The majority of these contracts include complete responsibility for engineering, procurement and construction, although several are strictly engineering design assignments.

### 3.2 NUCLEAR EXPERIENCE

Bechtel has participated in a number of milestones in the development of atomic energy for the generation of electricity. The Company constructed the first Experimental Breeder Reactor for the Atomic Energy Commission at Arco, Idaho. The first electric energy from nuclear fuel was generated at this facility. The West Milton power plant, using steam from the Submarine Intermediate Reactor, was designed and constructed by Bechtel. Electric energy generated at this plant was the first to be sent out over a utility distribution system. The first privately financed nuclear power plant was a 5,000 KW boiling water reactor power plant of General Electric and Pacific Gas and Electric Company - engineered and constructed by Bechtel. At the time of its commercial operation, the 160,000 KW Dresden nuclear power station, now 210,000 KW, was America's largest. Bechtel was engineer-constructor for this plant.

The following is a brief chronological summary of some of the most important nuclear projects undertaken by Bechtel:

#### NUCLEAR EXPERIENCE SUMMARY

- 1948 - Design of buildings for the Van de Graff Accelerator at Los Alamos, New Mexico, for the Atomic Energy Commission.
- 1949 - Construction of the first Experimental Breeder Reactor, Arco, Idaho, for the Atomic Energy Commission.
- 1950 - Engineering for the Mark I and Mark II Materials Testing Accelerator Project, Livermore, California, for the Atomic Energy Commission.
- 1950 - Construction of the \$20,000,000 Atomic Energy Commission Chemical Fuel Processing Plant, Arco, Idaho.
- 1951 - Investigation of technical and economic feasibility of nuclear power for Atomic



- Energy Commission in cooperation with the Pacific Gas and Electric Company.
- 1953 - Studies of reactor systems by members of Nuclear Power Group leading to selection of dual-cycle boiling water reactor for commercial application.
  - 1955 - Engineer-constructor for the 210,000 KW Commonwealth Edison Dresden boiling water reactor nuclear power station.
  - 1956 - Engineer-constructor for Vallecitos Atomic Laboratory of the General Electric Company.
  - 1956 - Engineer-constructor for the 5,000 KW boiling water reactor power plant of the General Electric Company and Pacific Gas and Electric Company.
  - 1956 - Engineer for Army Package Power Reactor 1-A, Fort Greely, Alaska.
  - 1958 - Engineer-constructor and prime contractor for the 70,000 KW Humboldt Bay Unit No. 3 for the Pacific Gas and Electric Company.
  - 1958 - Architect-engineer for the Atomic Energy Commission on the nuclear facility of the 75,000 KW sodium graphite Sheldon Plant for the Consumers Public Power District of Hallam, Nebraska.
  - 1958 - Engineer-constructor for Hot Cell facilities of the General Atomics Division of General Dynamics Corporation.
  - 1958 - Engineer-constructor for Hot Cell facilities of Atomic International Division of North American Aviation, Inc.
  - 1958 - Comparative design study and cost estimates for 300,000 KW organic cooled reactor nuclear power plant for the Atomic Energy Commission.
  - 1958 - Engineering of the Food Irradiation Center for the U. S. Army, Stockton, California.



- 1959 - Engineer-constructor and prime contractor for 40,000 KW high temperature gas-cooled reactor of Philadelphia Electric Company and High Temperature Reactor Development Association.
- 1959 - Engineer-constructor and prime contractor for 75,000 KW Big Rock Point nuclear power station for Consumers Power Company of Jackson, Michigan.
- 1960 - Detailed design and cost estimate of 375,000 KW pressurized water nuclear power plant for Southern California Edison.
- 1960 - Preliminary design and cost estimate of Nuclear Fuels Processing Plant for Davison Chemical Company.
- 1960 - Engineering and related services to the Junta de Energia Nuclear of Spain for the DON reactor project, a 30,000 KW organic cooled heavy water moderated reactor.
- 1961 - Study of 250,000 KW homogeneous pressurized heavy water reactor for Rederlaktiebolaget Nordstjernan Atomic Power Group (A. Johnson & Company), Nynashamn, Sweden.
- 1961 - Engineering for General Electric Company's Pulse Reactor at their Vallecitos Atomic Laboratory located near Livermore, California.
- 1961 - Construction of the Vallecitos Experimental Superheat Reactor for General Electric Company at Vallecitos, California.
- 1961 - Engineering and related services to the Atomic Energy Commission for the SNAP-8 Test Facility at Santa Suzana, California.
- 1962 - Conceptual studies for the National Aeronautics and Space Administration for the Nuclear Flight Stage Test Facilities at Jackass Flats, Nevada.
- 1962 - Engineering and related services for Union Electric Madrilenia of Spain for a 60,000 KW boiling water reactor.
- 1962 - Engineer-constructor for two 190,000 KW Tarapur atomic power stations to be built by General

Electric Company for the Indian Atomic Energy Commission.

- 1962 - Assistance to Union Carbide Nuclear Company, operators of Oak Ridge National Laboratory, in the preparation of a Reactor Containment Handbook.
- 1962 - Engineering and consulting services to the Pakistan Atomic Energy Commission for a 50,000 KW boiling water reactor for East Pakistan.
- 1962 - Engineering services to U. S. Navy for National Fallout Shelter Survey Program.
- 1962 - Engineer-constructor for Nuclear Fuel Service Corporation for the spent fuel processing plant constructed in New York.
- 1963 - Engineer-constructor for the 450,000 KW pressurized water reactor San Onofre nuclear generating station, of Southern California Edison Company and San Diego Gas and Electric Company, located near San Onofre, California.
- 1963 - For the Atomic Energy Commission and the Office of Saline Water, studied the problem of integrating large nuclear reactor combined water desalinization and power generating plants into existing power and water distribution systems.
- 1964 - Architect-engineer for Fast Reactor Test Facility for Argonne National Laboratory and the Atomic Energy Commission.
- 1964 - Architect-engineer to the Savannah River Nuclear Study Group for a feasibility study in connection with the conversion of a plutonium production reactor to an electric power production reactor.
- 1964 - Engineering study for the Metropolitan Water District for a nuclear combined electric power and sea water desalinization plant with a capacity of between 50 and 150 million gallons of fresh water per day and 150,000 to 750,000 KW of electric power.
- 1965 - Design engineering, procurement, construction and testing for the Texas A & M Variable Energy Cyclotron.

- 1965 - Engineer-constructor for the two 750,000 KW unit pressurized water reactor, Turkey Point Plant, for Florida Power & Light Company, located at Turkey Point, Florida.
- 1965 - Construction for the 450,000 KW pressurized water reactor, Robert Emmett Ginna nuclear power station for Rochester Gas & Electric Company located on Lake Ontario east of Rochester, New York.
- 1966 - Engineer-constructor for the 770,000 KW pressurized water reactor Palisades nuclear power plant for Consumers Power Company.
- 1966 - Engineer-constructor for the 520,000 KW boiling water reactor Monticello nuclear plant for Northern States Power Company.
- 1966 - Engineer-constructor for the two 450,000 KW unit pressurized water Point Beach nuclear plant for Wisconsin-Michigan Power Company.
- 1966 - Consulting engineer to Duke Power Company for a two 800,000 KW unit pressurized water nuclear power plant.
- 1966 - Engineer-constructor for the 1,100,000 KW BWR Peach Bottom Unit #2 for Philadelphia Electric Company and associated companies.
- 1967 - Consulting engineer to Southern Service, Inc./ Georgia Power Company for 750,000 KW Nuclear Power Plant.
- 1967 - Engineer-constructor for the 1,100,000 KW BWR Peach Bottom Unit #3 for Philadelphia Electric Company.
- 1967 - Engineering services for feasibility study for Ward Manor Nuclear Station for Central Hudson Gas & Electric Corp.
- 1967 - Engineer-constructor for the 650,000 KW BWR Plymouth Unit #1 for Boston Edison Company.
- 1967 - Engineering-manager of construction for the 800,000 KW PWR reactor Rancho Seco Unit #1 for the Sacramento Utility District.

- 1967 - Engineer-constructor for the 1,600,000 KW two unit pressurized water reactor Calvert Cliffs Nuclear Power Plant for Baltimore Gas and Electric Company.
- 1967 - Consulting services to Pennsylvania Power and Light Company for evaluation of nuclear steam supply system bids for an 800,000 - 1,000,000 KW nuclear power plant.

### 3.3 ORGANIZATION

The total staff of Bechtel Corporation, exclusive of manual workers, is now in excess of 6,000 employees. This includes members of management, professional personnel, and individuals in other non-manual functions.

Responsibility for design and construction of Russellville Nuclear Unit has been assigned to the Power and Industrial Division. This now comprises approximately 2,000 engineers, draftsmen, specialists and key field men qualified in power plant work. The Power and Industrial Division receives additional necessary support from other components in Bechtel; this includes technical, legal, procurement, estimating and employee relations assistance.

Of particular importance to nuclear projects is the function of the Scientific Development Department. Established in 1958, the Department comprises a selected staff of technical specialists whose functions include keeping abreast of the latest developments in reactor design and safety features. The personnel are continuously available for assistance, and usually have an active part in major nuclear power projects.

### 3.4 SUMMARY

In view of the above, it is believed Bechtel is qualified and capable of discharging its responsibilities to the project for which this license application is made.





EXHIBIT IV

AGREEMENT LIMITING ACCESS TO  
RESTRICTED DATA

Arkansas Power & Light Company as part of its application for licenses for its Russellville Nuclear Unit hereby agrees that it will not permit any individual to have access to Restricted Data until the Civil Service Commission shall have made an investigation and report to the Atomic Energy Commission on the character, associations and loyalty of such individual, and the Atomic Energy Commission shall have determined that permitting such person to have access to the Restricted Data will not endanger the common defense and security.

This 24th day of November, 1967.

ARKANSAS POWER & LIGHT COMPANY

By: William McCallum Jr.  
Senior Vice President