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FROM: Federal Power Commission Washington, D. C. 20426 T. A. Phillips		DATE OF DOC: 2-7-73	DATE REC'D: 2-8-73	LTR: X	MEMO	RPT	OTHER
TO: Mr. Muller		ORIG: 1	CC: 1	OTHER	SENT AEC PDR X SENT LOCAL PDR X		
CLASS: <u>U</u> PROP INFO		INPUT	NO CYS REC'D: 2	DOCKET NO: 50-331			
DESCRIPTION: Ltr re our 11-20-72 ltr.....furnishing comments on Draft Enviro Statement.....			ENCLOSURES:				
PLANT NAMES: Duane Arnold			<div style="border: 1px solid black; padding: 10px; display: inline-block;"> Do Not Remove ACKNOWLEDGED </div>				

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FEDERAL POWER COMMISSION

WASHINGTON, D.C. 20426

February 7, 1973

IN REPLY REFER TO:

50-331

Mr. Daniel R. Muller
Assistant Director for
Environmental Projects
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545



Dear Mr. Muller:

This is in response to your letter dated November 20, 1972, requesting comments on the AEC Draft Environmental Statement related to the proposed continuation of the Construction Permit No. CPPR-70 and issuance of an operating license to the Iowa Electric Light and Power Company, the Corn Belt Power Cooperative and the Central Iowa Power Cooperative for the Duane Arnold Energy Center (Docket No. 50-331).

Pursuant to the National Environmental Policy Act of 1969 and the April 23, 1971, Guidelines of the Council on Environmental Quality, these comments review the need for the facilities as concerns the adequacy and reliability of the affected bulk power systems and related matters. In preparing these comments, the Federal Power Commission's Bureau of Power staff has considered the AEC Draft Environmental Statement; the Applicant's Revised Environmental Report and amendments thereto; related reports made in response to the Commission's Statement of Policy on Reliability and Adequacy of Electric Service (Order No. 383-2); and the staff's analysis of these documents together with related information from other reports submitted to this Commission by the Applicants. The staff generally bases its evaluation on the need for a specific bulk power facility upon long term considerations as well as the load-supply situation for the peak load period immediately following the availability of the facility on the Applicant's system and that of the pool or regional coordinating area with which the Applicant is associated.

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Need for the Facility

The 550-megawatt nuclear Duane Arnold Energy Center is located on the Cedar River approximately two and one-half miles north-northeast of Palo, Iowa in Linn County. The facility is owned jointly by a consortium of the Iowa Electric Light and Power Company, the Corn Belt Power Cooperative, Inc. and the Central Iowa Power Cooperative, Inc., which will hereinafter be referred to as "the Applicant." The generating plant, which is now more than 60 percent complete, is scheduled for commercial service in December 1973 and should be available to assist in meeting the 1974 summer peak load.

The following tabulation shows the electric system loads to be served by the Applicant's system, by the Iowa Power Pool ^{1/} of which the Applicant was a part at the time the Arnold Energy Center was planned, and by the Mid-Continent Area Power Pool (MAPP), and the relationship of the electric power output of the Duane Arnold Energy Center to the projected available reserve capacities on the summer-peaking Applicant's, Iowa Power Pool and MAPP systems at the time of the 1974 summer peak load.

In January 1973 the members of the Iowa Power Pool, including the Applicant, became part of MAPP and filed with the Federal Power Commission to suspend the Iowa Power Pool agreement. Currently, the MAPP agreement is under study by this Commission and may or may not be in force at the time the Duane Arnold Energy Center is placed into commercial service. Therefore, both the data for the Iowa Power Pool and for MAPP are shown. Further, even under the MAPP agreement the Duane Arnold Energy Center will have a significant effect upon the Iowa Power Pool members because of its geographical location. The 1974 summer peak period is the anticipated initial service period of the new unit, and it is expected to constitute a significant part of the Applicant's total generating capacity throughout its lifetime. Therefore, the unit will be depended upon to supply power to meet future demands over a period of many years beyond the initial service needs discussed in this report.

- 1/ The members of the Iowa Power Pool other than the Applicant are:
- Iowa-Illinois Gas & Electric Co.
 - Iowa Power & Light Co.
 - Iowa Public Service Co.
 - Iowa Southern Utilities Co.

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1974 SUMMER PEAK LOAD - SUPPLY SITUATION ^{1/}

	<u>Applicants Combined Systems</u>	<u>Iowa Power Pool</u>	<u>MAPP</u>
<u>Conditions With Duane Arnold Energy Center (550 Megawatts) ^{2/}</u>			
Net Total Capability - Megawatts	1,280	3,906	17,245
Net Load Responsibility - Megawatts	932 ^{3/}	3,174 ^{4/}	14,611
Reserve Margin - Megawatts	348	732	2,634
Reserve Margin - Percent of Peak Load	37.3	23.1	18.0
Minimum Reserve needed based on 15 percent of Peak Load - Megawatts	139	476	2,192
<u>Conditions Without Duane Arnold Energy Center</u>			
Net Total Capability - Megawatts	730	3,356	16,695
Net Load Responsibility - Megawatts	932 ^{3/}	3,174 ^{4/}	14,611
Reserve Margin - Megawatts	-202	182	2,084
Reserve Margin - Percent of Peak Load	-	5.7	14.3
Reserve Deficiency - Megawatts	341	297	108

^{1/} Source - MARCA Report 383-2, dated 4-1-72.

^{2/} The 500 megawatt capacity of the Duane Arnold unit will be shared 90 percent or 476 megawatts to the Iowa Electric Light and Power Company and the Central Iowa Power Cooperative and 10 percent or 55 megawatts to the Corn Belt Power Cooperative.

^{3/} Net Load Responsibility reduced for Net Purchase of 10 megawatts and total USBR allocations of 32 megawatts.

^{4/} Net Load Responsibility reduced for Net Purchase of 463 megawatts and USBR allocation of 32 megawatts.

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The Applicants are members of the Mid-Continent Area Reliability Coordination Agreement (MARCA) as well as participants in the Iowa Power Pool and in MAPP. MARCA is the regional coordinating organization for the planning of bulk power generating and transmission facilities, operation of these facilities and provision for short term emergency relief in the event of contingencies normally experienced on interconnected power systems. Although the reliability standards for the MARCA region have been met by a minimum system reserve margin of 12 percent, this minimum reserve margin will be increased to 15 percent in 1974 to meet the reliability standard of loss-of-load probability of one occurrence in ten years. The increased reserve margin is made necessary by the large capacity of new thermal generating units coming in service in MARCA members' systems. These reserve margins are gross; in addition to providing for scheduled outages for maintenance, the reserve margin must provide an excess of generating capacity over the peak system demands to provide for errors in load forecasts, forced outages of generating equipment, slippage of scheduled availability of new units and spinning reserves. For this report, minimum reserve margins of 15 percent have been used.

The availability of the Duane Arnold Energy Center for 1974 summer peak load period would provide a reserve margin of 348 megawatts or 37.3 percent of the peak load responsibility on the Applicant's system. If delays for any reason should make this unit unavailable for this peak period, the reserve margin on the Applicant's system would be reduced to a negative 202 megawatts and a deficiency of 341 megawatts from the MARCA criterion would occur on the Applicant's system. Based on the Applicant's 1974 peak load responsibility of 932 megawatts a minimum reserve margin of 139 megawatts is needed to meet the 15 percent reserve criterion. Similarly, the Iowa Power Pool will have a reserve margin of 732 megawatts, or 23.1 percent of the peak load responsibility with the unit available; without the unit the reserve margin is reduced to 182 megawatts or 5.7 percent of the 1974 peak load responsibility of 3,174 megawatts. The deficiency of 294 megawatts on the Iowa Power Pool's system would require the Applicant to purchase power from other sources in order to maintain their needed reserve position. MAPP would have an 18 percent margin with the Arnold unit in service and 14.3 percent without it and thus would not meet its criterion of 15 percent installed reserve.

Review of the planned new capacity additions for the participating systems in the Iowa Power Pool during the period 1973 to 1981 reveals that only 1,180 megawatts of new capacity are planned. The 550-megawatt Duane Arnold unit will provide the bulk of reserve capacity available for these systems until 1976 when the 520-megawatt Neal Unit No. 3 comes into commercial operation. Hence, the reliability and adequacy of the generating

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capacity for these systems is dependent at least until 1981 upon the timely commercial operation of the Duane Arnold and Neal units.

Although some 5,932 megawatts of new capacity in large fossil and nuclear steam units are planned for commercial operation by 1981 within the MARCA region, the importance of adequate capacity resources to serve the projected demands and provide the needed reserves within the Iowa Power Pool must be given adequate consideration. The availability of adequate local generating capacity, without dependence upon large blocks of capacity from distant sources, is fundamental to system reliability.

Transmission Facilities

Six overhead transmission lines will be required to integrate the Duane Arnold Energy Center into the existing transmission system. Two 345-kilovolt lines will be located on a 500-foot right-of-way originating at the plant switchyard and extending westerly for a distance of 2.7 miles; both lines will then tie into the existing 345-kilovolt Hills-Adams line. One 161-kilovolt line will be located on the right-of-way and extend westerly for a distance of 2.7 miles terminating at the Washburn Substation. A second 161-kilovolt line located on a separate right-of-way extends southerly for a distance of 30.25 miles to terminate at the Bertram Substation. A 161-kilovolt extension of 46.4 circuit miles is planned by the Corn Belt Power Cooperative to deliver energy from the Washburn Substation to their system. A fourth 161-kilovolt line will extend from the plant site generally eastward for a distance of 7.8 miles to the Hiawatha Substation.

The design, routing and construction of the transmission lines were planned in accordance with the guidelines issued by the U. S. Department of the Interior and Agriculture in their joint publication, "Environmental Criteria for Electric Transmission Lines" and the Federal Power Commission's publication "Electric Power Transmission and the Environment." The lines will pass through cropland, pasture and woodland on routes selected for minimum environmental impact.

Alternatives and Costs

The Applicant, in determining the need for additional generation to meet its projected system needs, considered in addition to firm power purchases a number of practical alternatives including locations, plant type, fuels, environmental effects and economics. The Palo site was selected after consideration of 24 sites. The available undeveloped hydroelectric capacity in the State of Iowa was estimated in 1972 to be 346.4 megawatts of conventional hydroelectric capacity, with an associated

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annual energy potential of 1,637,400 megawatt-hours. Pumped-storage hydroelectric capacity is no alternative to baseload nuclear capacity; however, even if it could be considered a partial alternative, the total hydroelectric generated energy would not meet the energy production capability of the nuclear plant which is estimated to be some 3,923,000 megawatt-hours. Combustion turbine peaking units were considered; however, the high operating and maintenance costs of such units render them unsuitable for baseload operation.

Natural gas and fuel oil were not considered available in adequate quantities to meet the projected needs for a generating plant of comparable capacity, and the only alternative fuel available was considered to be coal. The choice of the nuclear-fueled plant was made after consideration of the fuel economics of coal-fueled and nuclear-fueled plants. The Applicant considered estimated capital costs of \$194 million or \$353 per kilowatt of capacity for the nuclear-fueled plant and \$111 million or \$202 per kilowatt of capacity for the coal-fueled plant. Annual fuel costs were estimated for the nuclear-fueled plant at \$6.5 million or 1.6 mills per kilowatt-hour, and for the coal-fueled plant at \$15 million or 4.0 mills per kilowatt-hour. The staff of the Bureau of Power finds the capital costs to be within the range of capital costs reported by the industry, however, the fuel costs are lower than most fuel costs currently reported by the industry.

Conclusions

The staff of the Bureau of Power concludes that the electric power output of the Duane Arnold Energy Center will be needed to meet the Applicant's, Iowa Power Pool's and MAPP's systems projected loads and to provide them with reserve margins in accordance with the regional coordination council's stated system reliability objective.

Very truly yours,



T. A. Phillips
Chief, Bureau of Power

Regulatory

File Cy.

