July 29, 1985

Docket Nos. 50-315
and 50-316

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Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Dolan:

By letter dated March 29, 1985, the Indiana and Michigan Electric Company provided, among other things, an analysis of the Donald C. Cook Nuclear Plant substation and AEP grid system in regards to the need for backup power for the containment hydrogen ignitors. We have completed a qualitative analysis of this information and a comparison of the Cook system to the Sequoyah system which we have approved. Our analysis and assessment is enclosed. On the basis of our review to date, we have determined that it is reasonable to conclude that D. C. Cook need not provide at this time any additional supplies for their hydrogen ignitor system.

If there are any questions on this matter, please let us know.

Sincerely,

/s/SVarga

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

ORB#1:DL	ORB#1:DL	CSB	BC-ORB#1:DL
CParrish	DWigginton;ps	JKudrick	SVarga
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Mr. John Dolan
Indiana and Michigan Electric Company

Donald C. Cook Nuclear Plant

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The Honorable John E. Grotberg
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Washington, DC 20515

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J. Feinstein
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ENCLOSURE

I. Background

The Indiana and Michigan Electric Company (IMEC) in a letter dated March 29, 1985, provided information on the American Electric Power (AEP) grid and the Donald C. Cook Nuclear Plant substation as justification for not providing backup power for the containment hydrogen ignitors.

Considering that IMEC has not developed a quantitative assessment of the probability of loss of all AC power at D. C. Cook and the ongoing work on USI A-44 on the topic of station blackout, the staff performed a qualitative design comparative assessment of the D. C. Cook to the Sequoyah power supply system. This was to help determine whether further consideration should be given to a backup power supply for the hydrogen ignition system in the event of degraded core accidents in conjunction with a station blackout. The Sequoyah plant already has an installed hydrogen control system without additional power sources beyond that provided by existing emergency onsite diesels which has been approved.

II. Qualitative Analysis

Recognizing the fact that an electric power system's capability to withstand disturbances resulting in total losses of AC power for the station is to a large degree a function of the system design features, a comparison of the D. C. Cook to the Sequoyah electric system design was made to determine on a qualitative basis how the D. C. Cook design related to the previously accepted Sequoyah design. Presently estimated power requirements from the hydrogen control system for both plants are as follows:

	D. C. Cook	Sequoyah
type	glow plug .	igniter
voltage/power consumption	12-14V AC/100W	120V AC/500W
approximate number	70	80
power requirement	7 kW	40 kW

The basis for comparison of the two plants is that both D. C. Cook and Sequoyah have the following comparable power system capability and similar inplant design features.

	D. C. Cook	Sequoyah
no. of diesel/capacity (ea.)	4/3500 kW	4/4000 kW
LOCA load requirement	2760 kW	3537 kW
capability to intertie between units	Yes	Yes

Comparison of Offsite Power System Designs

	D. C. Cook		Sequoyah	
	Unit 1	Unit 2	Unit 1	Unit 2
Switchyard[1]				
No. of offsite lines to switchyards (switchyard voltage)	8(345kV)	2(765kV)	4(500kV)	10 (161kV)
Interconnection				
Between the onsite and the switchyard (excluding step up X-formers)	1 - 765 kV 1 - 345 kV 1 - 69 kV		2 - 161 kV	
Switchyard Breaker Configuration	breaker and a half scheme		bus transfer scheme	
Distribution Transformers				
(A) Step up	2		2	
(B) Common station service (startup)	6[2]		2	
(C) Unit station service, or unit auxiliary	4		4	

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1 Both plants include a transformer which connects between units (i.e., 765/345 kW for D. C. Cook and 500/161 kV for Sequoyah) as an offsite source.

2 This includes two 69/4.16 kV transformers which can be connected from one 69 kV offsite power source.

III. Comparison

A. The D. C. Cook switchyard design employs a breaker and a half scheme which provides a simpler and more reliable isolation capability for a certain faults (e.g. transmission line faults, bus faults, and stuck breaker cases) with no or minimal disruption to the offsite power availability. In case of Sequoyah, the switchyard design has a similar capability, but requires a series of breaker operations for its transfer scheme to work and also may involve time delays. Thus, the D. C. Cook switchyard design is less susceptible to failure as a result of system transients.

B. Upon unit trip, both Sequoyah and D. C. Cook require a transfer scheme to isolate the main generator from the offsite power system which establishes the offsite power source to supply inplant safety equipment through common station service transformers for Sequoyah and from the preferred offsite power source through transformer no. 4 for D. C. Cook. In contrast to the offsite power supply design for Sequoyah which actually feeds from one 161 kV switchyard, the offsite power from D. C. Cook is available from three different switchyards, namely, 69 kW, 345 kV, and 765 kV which undoubtedly reduces the potential for total loss of offsite power. This, inturn, increases the availability of offsite power.

C. Although both designs provide two diesel generators per unit, manual crossties exist in both plants, which make it possible to use one of the diesels from the other units, to supply emergency loads should both diesels be lost on one unit. In addition, D. C. Cook has an additional 69 kV offsite power source which can be connected manually to emergency buses, which is not present on Sequoyah.

IV. Conclusion

By considering all the above design features such as immediate, multiple accessibility to the offsite power source, instantaneous isolation capability of the breaker and a half arrangement and an additional 69 kV power source, the staff concludes that qualitatively D. C. Cook's AC power supply system reliability is somewhat better than that of Sequoyah. Therefore, on the basis that Sequoyah was not required to provide additional power supplies beyond the existing emergency sources for the hydrogen ignition system, it is reasonable to conclude that D. C. Cook need not provide any additional supplies for their hydrogen ignition system.