

# DUKE POWER COMPANY

LEGAL DEPARTMENT

P. O. Box 33189

CHARLOTTE, N. C. 28242

WILLIAM LARRY PORTER  
ASSOCIATE GENERAL COUNSEL

(704) 373-4825

October 11, 1978

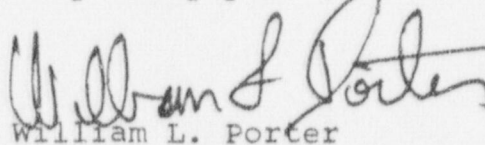
Mr. Richard McClymonds  
Electrical Engineer  
Power Supply Analysis Section  
Antitrust and Indemnity Group  
Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Re: McGuire Nuclear Station, Units 1 and 2

Dear Mr. McClymonds:

In your letter of September 15, 1978, you indicated that Regulatory Guide 9.3 identifies the information needed by the NRC staff in connection with the antitrust review of an operating license application for nuclear power plants. Duke has reviewed the subject regulatory guide and furnished the necessary information, which was enclosed with my letter of December 10, 1976. Your September 15, 1978 letter indicates that you need additional information. Enclosed is the Company's response to your request for additional information.

Very truly yours,

  
William L. Porter

WLP/fhb  
Encl.

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Question 1

If, as a result of future smaller reserves, some load must be dropped, please explain Duke's load shedding scheme, especially with regard to the allocation of the number and duration of outages to Duke's various customers.



Duke's Response to Question 1:

SUMMARY OF EMERGENCY PLANS

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DUKE POWER COMPANY  
EMERGENCY PLANS FOR SYSTEM OPERATION

Duke Power has developed emergency plans to provide for the maximum possible continuity of service during periods of capacity shortages caused by unscheduled outages of large generating units, fuel shortages, electric equipment failures, or delays in startings of new units. Such conditions during the heavy summer and winter load periods could make it necessary to reduce loads in which case the following procedures would be implemented to the extent necessary by the Operating Department.

Step 1. A voltage reduction on feeders equipped with regulating devices will be put into effect in an attempt to reduce load. In the past it has been estimated that this step would effect a 120 MW reduction of load. Since that number has not been verified through experience because its value is dependent on the season of the year and other factors difficult to determine, further studies and analyses are being made and in an effort to obtain that verification. This plan has been coordinated with Municipals and Cooperatives and they will be requested to participate in this step.

Step 2. Should Step #1 provide less than the required reductions in load, a general request will be made through the news media asking all customers to voluntarily curtail use of electricity where possible. Special contact will be made with larger individual industrial customers along with the general request. The effectiveness of this step is determined by the degree of cooperation obtained from the public and is therefore impossible to quantify. It is still considered to be a worthwhile step with some degree of positive effectiveness. The larger customers to be contacted have been listed and the responsibility to contact has been assigned. Municipals and Cooperatives will be requested to participate in this action.

Step 3. Should load reductions in addition to those obtained in Steps #1 and #2 be required, a two-step plan of relief through interruption of distribution feeders will be used. All feeders have been examined and classi-

fied according to the effect that an interruption would have on the customers. In Step (A), those feeders, Table No. II, with basically residential services have been determined, and interruptions will be from this group. The total potential relief from these feeders is approximately 1,481 MW, and if only a portion of this 1,481 MW is required, records will be kept so that the interruptions can be rotated to different feeders should the critical period extend over more than a few hours. In Step (B), additional feeders, Table No. III, with a higher concentration of commercial and industrial services will be interrupted should this additional relief be required. These feeders total 2,299 MW and offer additional potential for rotation to eliminate unduly long outages to any one group. Feeders serving hospitals, water supply installations, and other public service type of load are not included in this load relief plan. Municipals and Cooperatives will be requested to participate in this action.

Step 4. In the event of a decline in system frequency, underfrequency relays are in service at various locations which will automatically shed load to assist in frequency recovery and in maintaining stability. A total of over 3 million KW of load, Table IV, is subject to this automatic control in three approximately equal steps with shedding being done at 59.3, 59.0, and 58.5 hertz. Following such an emergency and once normal frequency is restored, we would revert to Steps #1, #2, and #3 as required and operate in this mode until normal service is restored.

In the effort to maintain system stability following a sudden loss of generation or some other abnormality, a plan "Emergency Procedures for System Stability", Pages 4-6 would be implemented. Should there be insufficient time to implement this plan, our system design includes provisions for equipment protection and for fast restart should a portion or the entire system experience a shutdown. All of our generating units are capable of rejecting full load without damage and without loss of station auxiliaries. All of our generating units are also equipped for safe rundown in the event of loss of



auxiliary power. All of our steam generating units also have black start capability either by use of combustion turbines installed at the generating stations or from express transmission circuits which can be made quickly available from hydro generating plants. All steam generating plants have plans for holding or picking up local loads and energizing certain system feeders in emergencies.

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DUKE POWER COMPANY  
EMERGENCY PROCEDURES FOR SYSTEM STABILITY

Purpose

Duke Power has in existence procedures whereby steam-electric generating station personnel take action to prevent damage to generating units should a major outage occur; thereby, having these generators available for rapid restoration of service once the cause of the outage has been corrected. Operating personnel at substations have instructions in the event of a failure of power supply to open all load switches to permit restoration of power supply to the transmission system, following which load switches are closed to restore service. The purpose of the plan entitled "Emergency Procedures for System Stability" is to prevent the conditions developing to the extent that it would become necessary to implement those procedures required to protect generating units.

Use of this plan should prevent a complete system interruption caused by the tripping of tie lines following the loss of large blocks of generation on our system. As long as our tie lines remain closed and the interconnected systems remain intact, loss of large blocks of generation will not seriously affect frequency. The general load-frequency characteristic for the interconnected systems in the USA is approximately 4,000,000 kilowatts per tenth hertz reduction in system frequency. Loss of generation on the Duke system in large amounts and associated tripping of tie lines could result in the frequency on the Duke system declining to 58.5 hertz depending upon the tie line loading prior to trip. At this frequency it would be necessary to separate the remaining steam-electric generating units from the system in order to protect them from damage or failure. It is important, therefore, to act as rapidly as possible following the loss of large blocks of generation to reduce the system load requirements in the effort to prevent tie lines from tripping.

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### The Plan

The Plan provides for a prompt reduction in system load should this emergency condition arise. All transmission lines which operate as radial lines supplied from attended substations and also all radial lines supplied from non-attended substations which are operated by remote control have been reviewed. Accompanying table No. V shows the detail and summaries of the loads to be dropped and the sequence of dropping. In summary, the Plan is to affect a maximum load reduction of approximately 1334 MW initially, followed by additional steps of approximately 778 MW and 370 MW if required.

### Implementation

This plan will be initiated by the Load Dispatchers in the Charlotte office. This office is equipped at the present time with generation recorders for all major thermal plants and the Cowans Ford, Jocassee, Keowee and Oxford Hydro plants. Loss of generation capacity in large blocks at these stations is, therefore, monitored. In addition, this office is equipped with recording instruments on all tie lines. The effect of loss of generation on tie line loading may be determined.

A color-number system has been devised for use by Dispatchers and Operators in initiating the Plan. This system will designate the order of priority for reducing load and the sequence in which the Plan is to be executed. For example; the initial reduction of 1334 MW will be made by Operators upon receipts of orders from the Dispatcher to proceed with "Emergency Relief Plan Red 1". If further reduction becomes necessary, the Dispatcher will order the Operators to proceed with "Emergency Relief Plan White 2". If a third reduction is necessary, the Dispatcher will order the Operators to proceed with "Emergency Relief Plan Blue 3".

As soon as the Charlotte Dispatcher determines that a loss of generation has occurred and that the result is probably tripping of tie lines, he will promptly instruct the Area Dispatching offices located at Spartanburg, Greensboro, and Great Falls, using the "Emergency Relief Plan" Color-Number

System so that there will be no doubt as to the nature of the instruction. The Area Dispatchers and the Charlotte Dispatchers will then instruct the Operators at substations and hydro plants affected, using the "Emergency Relief Plan" Color-Number System. Operators will then proceed immediately to execute the switching necessary to accomplish the load reduction. At the same time the Load Dispatchers in Charlotte will be calling upon all generating stations for maximum generation.

#### Responsibility

The responsibility for initiating this load reduction program will be vested in the Load Dispatching Office in Charlotte.

#### Public Relations Instructions

In the event it is necessary to implement the "Emergency Relief Plan", Operating personnel will observe the following procedure in handling calls or inquiries from customers; the caller will be informed that, "We have had some major system trouble, the location and cause of which I do not know at this time. Some of our lines have tripped and we are working to restore service as quickly as possible. Listen to your transistor/battery radio for further information." Callers from large industries, and other large customers will be informed: "At this time we do not know the nature or duration of the trouble. However, as soon as we know more about the outage you will be advised." Public Relations handling of this type trouble at various locations on the system, such as Distribution Districts and Branches, will be handled by separate announcements.

3/29/78



TABLE I  
DUKE POWER COMPANY

Estimated Effect of 5% Voltage Reduction in Reducing Power Demand

DIVISION	KW REDUCTION IN 1/2 HOUR	KW REDUCTION IN 1 HOUR	TOTAL REDUCTIONS KW	IN ____ HOURS	LATEST REVISION
Southern	36,183	55,919	65,787	1½	February 1978
Western	32,315	43,382	44,267	1½	February 1978
Central	27,085	45,142	75,236	2	February 1978
Northern	34,850	51,712	56,209	1½	February 1978
Eastern	55,812	86,335	87,207	1½	February 1978
TOTAL	186,245	282,490	328,706		

NOTE: Operation of line voltage regulators and voltage control capacitors is expected to limit the expected load reduction to approximately 120,000 KW.

3/29/78

TABLE II  
DUKE POWER COMPANY

Estimated Effect of Manual Interruption to Class III Circuits\*

DIVISION	KW REDUCTION IN 1/2 HOUR	KW REDUCTION IN 1 HOUR	TOTAL REDUCTION KW	IN ____ HOURS	LATEST REVISION
Southern	217,210	337,882	402,241	1½	February 1978
Western	149,636	184,736	184,736	1	February 1978
Central	186,999	351,100	381,630	1½	February 1978
Northern	153,605	168,135	207,575	1½	February 1978
Eastern	143,344	283,639	304,988	1½	February 1978
TOTAL	850,794	1,325,492	1,481,169		

\*Class III Circuits Supply Primarily Residential Loads.

3/29/78



TABLE III  
DUKE POWER COMPANY

Estimated Effect of Manual Interruption to Class II Circuits\*

DIVISION	KW REDUCTION IN 1/2 HOUR	KW REDUCTION IN 1 HOUR	TOTAL REDUCTION KW IN ____ HOURS	LATEST REVISION
Southern	309,016	353,161	367,876 1½	February 1978
Western	146,362	247,689	281,465 1½	February 1978
Central	231,687	440,659	454,288 1½	February 1978
Northern	171,908	266,289	337,075 1½	February 1978
Eastern	480,644	763,881	858,295 1½	February 1978
TOTAL	1,339,617	2,071,679	2,298,997	

\*Class II Circuits Supply Primarily Commercial Loads.

3/29/78

TABLE IV  
DUKE POWER COMPANY

Effect of Underfrequency Relay Operation

<u>DIVISION</u>	<u>KW REDUCTION 59.3 Hz</u>	<u>KW REDUCTION 59.0 Hz</u>	<u>KW REDUCTION 58.5 Hz</u>	<u>KW REDUCTION TOTAL</u>	<u>LATEST REVISION</u>
Northern	209,800	32,500	207,400	449,700	3/22/78
Eastern	158,500	172,400	47,600	378,500	3/22/78
Southern	267,800	327,700	160,300	755,800	3/22/78
Western	123,700	0	315,900	439,600	3/22/78
Central	<u>244,100</u>	<u>465,200</u>	<u>277,700</u>	<u>987,000</u>	3/22/78
TOTAL	1,003,900	997,800	1,008,900	3,010,600	

3/29/78



TABLE V  
DUKE POWER COMPANY

Effect of Emergency Procedures for System Stability

<u>DIVISION</u>	<u>KW REDUCTION FIRST STEP</u>	<u>KW REDUCTION SECOND STEP</u>	<u>KW REDUCTION THIRD STEP</u>	<u>KW REDUCTION TOTAL</u>	<u>LATEST REVISION</u>
Northern	56,500	130,200	111,100	297,800	3/22/78
Eastern	215,100	57,300	0	272,400	3/22/78
Southern	467,700	222,100	89,900	779,700	3/22/78
Western	138,300	43,300	39,600	221,200	3/22/78
Central	<u>456,700</u>	<u>325,200</u>	<u>128,900</u>	<u>910,800</u>	3/22/78
TOTAL	1,334,300	778,100	369,500	2,481,900	

3/29/78

4/27/78 (correction)

Question 2

- a. What was the last peak load of Davidson in kW before acquisition?
- b. Did Duke supply all of Davidson's power and energy requirements before acquisition? If not, who did?
- c. Who evaluated the Davidson system besides Duke?
- d. Who initiated the takeover request? Why?
- e. Was there any organized opposition to the takeover? If so, who and with what result?
- f. To Duke's knowledge, were there any other bulk power suppliers capable of serving Davidson's load?
- g. Was Duke ever approached to wheel power into Davidson from any other bulk power supplier?



Duke's Response to Question 2:

- a. Maximum demand during 1975 - 4236 KW  
November, 1975 demand was - 3516 KW
- b. Duke supplied all of Davidson's power and energy requirements before acquisition.
- c. The Mayor and Town Commissioners evaluated Duke's offer and the Local Government Commission of the State of North Carolina evaluated and endorsed the proposal.
- d. The request for a system evaluation was made by letter from the Mayor of Davidson after the Board of Commissioners passed a motion to solicit such an evaluation without obligation to either Duke or the Town of Davidson. The request for evaluation was made because the Town's consulting engineering firm completed a study recommending expenditures for improvements in the Town's distribution system estimated to cost \$390,000.00. These improvements would increase the Town's bonded indebtedness to \$940,000.00.
- e. Not to our knowledge. The Town Board held public meetings for discussion and some individuals made remarks opposing the sale. Apparently, there was no organized opposition to the takeover.
- f. No, not to our knowledge.
- g. No, not to our knowledge; however, the Southeastern Power Administration (SEPA) may have contacted Davidson in 1963 or 1964.

T. S. SADLER  
Mayor

W. E. BRANNON  
Treasurer-Clerk

## TOWN OF DAVIDSON

Davidson, North Carolina 28036

COMMISSIONERS  
Mrs. E. R. MacCormac  
G. C. Meitze, Jr.  
J. G. McClain  
H. B. Noremore  
J. W. Reid, Jr.

ADMINISTRATOR  
E. T. McEver

November 6, 1974

Mr. A. M. Neely  
Duke Power Company  
P. O. Box 2178  
Charlotte, North Carolina 28201

Dear Mr. Neely,

In line with our recent conversation, we have talked to various members of the Board of Commissioners, who at their last meeting passed a motion to solicit from Duke Power Company, an evaluation of the worth of our electric power distribution system. It is our understanding that such an evaluation can be made without obligation to either Duke Power Company or the Town of Davidson.

We realize that such arrangements are not necessarily your province, but we know that you can put our request in the hands of the proper persons.

Should additional information be desired or required to put this project under way, we shall be more than happy to supply whatever is needed.

Thank you for your consideration.

Yours truly,

*T. S. Sadler*

T. S. Sadler, Mayor  
Town of Davidson

TSS/rwk



TO THE CITIZENS OF DAVIDSON:

After two years of detailed studies, your Mayor and Commissioners invited Duke Power Company to make an offer for the Town's electric distribution system. On June 16, 1975, the Commissioners voted to accept Duke's offer subject to referendum. A special election has been set for September 9, 1975, so that the citizens of Davidson can decide whether to support the action of the Town Board in accepting the offer.

It is important that you be informed before reaching your personal decision; and to assist you in making a summary of facts relating to the sale.

We urge you to  
submit

We urge you to vote "FOR" the issue

FOR:

The Town of Davidson selling its electric distribution system to Duke Power Company for \$506,200.00, to be paid in 30 equal annual payments bearing interest on unpaid balances of 9-5/8% per annum.

AGAINST:

The Town of Davidson selling its electric distribution system to Duke Power Company for \$506,200.00, to be paid in 30 equal annual payments bearing interest on unpaid balances of 9-5/8% per annum.

Sincerely,

*Davidson*

Mayor

*Henry D. Brown*

Commissioner

*Davidson*

Commissioner

*H. C. Brown*

Commissioner

*James H. Hill*

Commissioner

*Arthur J. Brown*

Commissioner

SUMMARY OF FACTS COVERING THE PROPOSED  
SALE OF THE TOWN OF DAVIDSON'S ELECTRIC  
DISTRIBUTION SYSTEM TO DUKE POWER COMPANY

1. The Mayor and Commissioners have unanimously voted to accept Duke's offer subject to referendum.
2. The Local Government Commission of the State of North Carolina has evaluated the proposal and endorsed it.
3. The electric customers of the Town will save an estimated \$55,444.00 annually in reduced electric bills; 90% of the customers will have lower bills.
4. The Duke offer of \$506,200.00 will be paid in equal annual installments including interest on unpaid balances at 9-5/8%. These payments will be \$52,020.19 per year and total \$1,560,605.73 over the period.
5. The present Mayor and Board of Commissioners do not contemplate the necessity of any increase in Ad Valorem taxes as a result of this sale. Only if unusual and presently unforeseen expenses are incurred would a tax increase be required.
6. The financial condition of the Town will be greatly improved since expenditures for system improvements recommended by the Town's Consulting Engineer, presently estimated at \$390,000.00 will be avoided. These improvements could only be financed by a bond issue which would increase the Town's bonded indebtedness to \$940,000.00 and debt service on the new issue would amount to approximately \$40,000.00 per year. To meet this debt service, electric rates would have to be increased a further 14% or Ad Valorem taxes increased by 39%.
7. It is the intention of the present Mayor and Board of Commissioners to apply only interest on the sales price to current Town operations and to set aside principal payments so that at the conclusion of the 30-year period the principal amount of \$506,200.00 will be intact. Obviously, this Board can not commit future Boards to continue this practice, but even if principal payments are applied to current operations of the Town in future years, requirements for Ad Valorem taxes will be reduced to that extent.
8. The cost of electric power to be purchased from Duke for street lighting, etc., has been substantially included in the adopted 1975-1976 budget as reliable estimates of the cost thereof. Therefore, no additional revenues would be required at the point such purchases are actually made.
9. Duke will establish an office in Davidson to serve Davidson and the surrounding area and will pay additional Ad Valorem and Franchise taxes to the Town amounting to approximately \$5,000.00 per year.
10. The Town's electrical employees will continue to work for the Town or be offered employment with Duke.
11. Answers to any questions related to the sale will be supplied upon request at the Town Hall.

(Prepared and distributed by the Mayor and Town Commissioners of Davidson, North Carolina, at no cost to the Town.)