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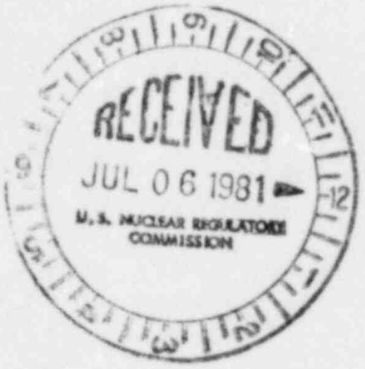
June 26, 1981

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Attn: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing
Washington, DC 20555



Reference: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License DPR-66
Emergency Public Warning System

Gentlemen:

Title 10, Code of Federal Regulations, Part 50.47.b.6 specifies that provisions must exist for prompt communication to the public in the event of an emergency at the Beaver Valley Power Station. Appendix E to 10 CFR 50 and Appendix 3 to NUREG-0654 specify that the capability must exist by July 1, 1981.

Duquesne Light is committed to the installation of a public warning system responsive to the guidance of Appendix 3 to NUREG-0654 and has been actively pursuing the installation of this system. However, the installation of this system has been delayed as a result of several factors. Although none of these factors are particularly unique to the Beaver Valley Power Station emergency planning zone, the combination of these factors has resulted in unavoidable delays. Specifically:

1. The Beaver Valley Power Station emergency planning zone is comprised of three counties in three states and numerous local municipalities. Although cooperation by offsite authorities has been excellent, negotiations for locations, system design, right-of-way and other similar considerations have been compounded by the numerous political entities that we have had to work with.

2. The terrain of the Beaver Valley Power Station emergency planning zone is largely characterized as tree-covered hills with deep valleys and pockets of population along the river valleys. Because of this terrain, siting siren locations has been more difficult and additional sirens have been necessary to adequately cover the EPZ. Duquesne Light performed field testing to verify calculated ranges over this difficult terrain.

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3. An additional factor related to the three county makeup of the Beaver Valley Power Station emergency planning zone is the necessity for three separate activiation and control systems. This has compounded engineering efforts.

4. Large portions of the Beaver Valley Power Station emergency planning zone have population densities too sparse to justify notification by fixed sirens. In order to provide a supplementary system that would be effective, reliable and under the control of the utility. Duquesne Light has developed a residential electric meter box-mounted mini-siren system that would be activiated by the county via digitally encoded signals transmitted on a power line carrier. Since there are only minimal precedences (and none directly related to sirens) for such a system, the engineering effort has been, of necessity, extensive. However, once installed, there will be a greater assurance that these devices will be in place and operable during an emergency than there exists for the other suggested supplementary systems.

5. Large areas of the Beaver Valley Power Station emergency planning zone are not within the service area of Duquesne Light Company. This has complicated right-of-way and siren power supply considerations.

6. Forty-six sirens were orderd on October 31, 1980. Forty-six additional sirens were ordered on March 16, 1981. Delivery of initial order was received June 19, 1981. However, the complete radio control system, described in Attachment 1, will not be available until mid-November of this year. An interim manual activation system is to be provided by early July. The intial purchase order for the mini-siren equipment was issued October 14, 1980, and revised in April 1981. Delivery is not expected before the Fall of 1981.

Although Duquesne Light has been working actively to resolve these considerations, it will not be possible to have this system installed and operational by July 1, 1981. Pending satisfactory resolution of negotiations with governmental agencies and delivery of the required equipment, our current projection of the completion and testing of a major portion of the siren system and part of the supplementary system is November 30, 1981, with completion of the system projected for the Spring of 1982. Please note that as individual sirens are installed, they will be made operational and control turned over to the counties. Installation priority will be placed on the close-in sites and working outward.

Duquesne Light Company respectfully requests relief from the July 1, 1981, criterion. The attachments to this letter describe the current status of the engineering, legal and purchasing considerations of the system, describe the design criteria upon which the system was designed and provide a projected schedule for installation and testing.

If you have any questions, please call my office.

Very truly yours,

J. J. Carey
Vice President, Nuclear

Enclosures

cc: Mr. D. A. Beckman, Resident Inspector
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Attachment 1

BEAVER VALLEY POWER STATION
Emergency Planning Zone
Emergency Public Warning System

DESIGN CONCEPT

1. Design Overview

In its design of the Beaver Valley Power Station emergency public warning system, Duquesne Light has adhered to the following objectives:

a. To provide a warning system that would be reliable and effective.

b. To provide a warning system that would be responsive to the requirements of Appendix 3 to NUREG-0654 and Appendix E to 10 CFR 50 and to various related industry standards and engineering practices.

c. To incorporate features that would allow for flexibility in use, such that emergency response personnel could tailor activation of the system to the specific emergency at hand, for any type of natural or industrial emergency; and where appropriate to incorporate fire warning signals.

The Beaver Valley Power Station emergency planning zone (EPZ) encompasses portions of three counties in three states. As a result, there are essentially three separate warning systems, one for each county. Each of these systems is activated only by personnel in the respective county's emergency communication center. Some of the sirens, mostly those with the third fire signal, can also be operated remotely at the siren location (eg: firehouse). Although each of these systems is under the physical control of the counties, Duquesne Light will retain ownership and will be responsible for periodic and corrective maintenance.

In Hancock County, West Virginia, and Columbiana County, Ohio, the system will be comprised soley of fixed sirens located to provide 100% coverage of the population in that county's portion of the EPZ. In Beaver County, the sirens will comprise the primary notification system. Approximately 1400 smaller, residence-located mini-sirens will be used to provide warning to those residences located in areas with population densities too sparse to justify a full-size siren. These mini-sirens form the secondary warning system. Since this secondary system utilizes the electric transmission system as an activation means, the system could only be used in Beaver County since the Duquesne Light service area does not include either Hancock County or Columbiana County. As with the primary system, these mini-sirens will be activated by the Beaver County Communications Center.

2. Primary System (Sirens)

Duquesne Light will install sirens to provide the primary means of emergency public warning in the Beaver Valley Power Station emergency planning zone. These sirens will supplement or replace existing sirens. Where it has been requested by county and/or fire authorities, existing sirens will be upgraded and incorporated into the overall system.

Two siren types have been selected on the basis of field testing and engineering evaluation. They are:

a. The 125 db Alerting Communicators of America (ACA) "Allertor" rotating directional siren. Use of 56 of this siren type is currently planned.

b. The 112 db ACA "Banshee" nondirectional siren. Thirty-six (36) of this siren type are currently included in the system design.

Duquesne Light used the guidance from FEMA CPG-1-17, Outdoor Warning System Guide, the results of field testing and the results of population studies in the EPZ to establish siren ranges used in the selection of siren locations. For areas with population greater than 2000 persons/square mile, including Aliquippa, Beaver, Bridgewater, Midland, Monaca, Patterson Heights, South Heights, Patterson, Vanport, East Liverpool, Liverpool, Newell, Chester, Lawrenceville, and portions of Brighton Center and Hopewell, the range is based on a 70 db signal. For the remaining communities a 60 db signal was considered acceptable. The projected ranges for both siren types were:

	Ranges to Signal	
Siren Rating	70 db signal	60 db signal
125 db siren	4525 ft.	9050 ft.
112 db siren	1838 ft.	3676 ft.

In most installations, the sirens will be pole mounted, approximately 60 feet above ground. The sirens will incorporate controls for two tones/two signals. Where requested by fire authorities, Duquesne Light is installing controls for a third signal to be used for fire purposes. The signal options will provide the alert warning, nuclear attack, all clear, and where requested, appropriate fire signals.

The sirens are radio-controlled from each respective county's communication center. The radio carrier is modulated by a digitally encoded signal. The coding scheme provides for selective or total activation of sirens within a county, and provides for separate three county control, while utilizing a common radio carrier. The radio carrier is the DLC Industrial Radio System (approximately 150 MHz).

An encoder terminal is provided in the communication center for each county. This encoder supplies encoded signals to one of three radio base stations. Digital encoding eliminated inadvertent siren activation due to harmonics and/or radio static.

Each siren installation has a receiver/decoder which decodes the broadcast activation signal, and if applicable to that installation, activates the appropriate siren signal controller. At some siren locations (eg: firehouses), parallel manual controls allow for backup operation of certain siren signals.

3. Secondary System

In Beaver County, it was decided to utilize a transmission line signaling system to trigger mini-sirens mounted on the residence's electric meter box, for those residences located in areas where larger fixed sirens would not be cost effected. There are to be approximately 1400 of these systems installed.

In this system, a digitally encoded signal is injected into the electric distribution system. This signal is carried throughout the distribution system (where desired). Local management terminals (LMTs) located in each affected meter box receive and decode the signal. If the code is proper, the LMT will energize the mini-siren.

Since the system components are hardwired into the distribution system, there is a greater probability that these devices will be operable in the event of an emergency. Most other residence-located signaling devices, such as NOAA radio and tone-alerts, can be readily disabled by the householder, either deliberately or unintentionally.

Although the use of such a system for siren activation is relatively unique, the use of transmission line signaling equipment is not new. Such equipment is being used for automated load management, remote meter-reading (LMTs can be bi-directional) and substation control. Tests at Detroit Edison and Carolina Power and Light for load management has indicated that the power line carrier is a viable communication media. At CP & L, 380,000 two-way tests with 20 LMTs indicated a 98.2% effectiveness. Later testing with a different frequency showed a 99.1% performance.

Duquesne Light performed field testing on its distribution system for 13 days in January, February and March of 1981. These tests demonstrated system capabilities and helped define system parameters. As a result of these tests, the operating frequency of the control system had to be changed to prevent interference with existing communications and protection relaying equipment. This caused an additional delay in engineering and equipment procurement.

The system was engineered by Westinghouse Electric to Duquesne Light specifications. As with the primary system, mini-siren activation would come from the Beaver County Communication Center. This activation would be interfaced with the system computer located at the DLC System Control Center via land lines. The computer would generate the requisite codes, which would then be relayed to approximately three DLC substations in the EPZ by land lines. Modulators at the substations would inject the coded signals into the distribution system.

Attachment 2

BEAVER VALLEY POWER STATION
Emergency Planning Zone
Emergency Public Warning System

SYSTEM CHRONOLOGY

1. In December 1979, Duquesne Light contracted the A.M. Voorhees and Associates, Inc. to perform a mass notification and evacuation study of the Beaver Valley Power Station emergency planning zone. Although the primary purpose of this study was to provide the evacuation time estimates required to be submitted to the USNRC in January 1980, the study scope included an assessment of alternative methods to provide area-wide mass notification and to identify a method or combination of methods for the Beaver Valley Power Station emergency planning zone. The final report was presented to Duquesne Light at a meeting on March 27, 1980.

2. The Voorhees report was given a preliminary review, and a Construction Order was issued on April 18, 1980. Following some initial groundwork, an initial design concept was approved by the Duquesne Light Corporate Committee on April 30, 1980, and was issued May 1, 1980.

3. Engineering activities for the Beaver County portion of the emergency planning zone commenced. Discussions were held with siren vendors in early May 1980 and with Westinghouse Electric (mini-sirens) in early June. Out of these efforts came proposed siren locations, siren specifications, siren control systems design and a siren field test procedure.

4. A field test of sirens from two manufacturers was conducted on September 18, 1980, to determine the effective range under conditions typical to the Beaver Valley Power Station emergency planning zone.

5. The proposed Beaver County system was presented to the Director, Beaver County Emergency Management Agency and the Director of the Beaver County Communications Center at two meetings held in October 1980.

6. On November 14, 1980, a purchase order was issued to Westinghouse Electric for equipment and engineering related to the mini-siren system.

7. On November 31, 1980, a purchase order was issued to ACA for 16-125 db and 30-112 db sirens. Delivery was received June 19, 1981.

8. A series of meetings were held with fire department officials in Beaver County.

9. Preliminary engineering activities commenced for the siren systems in Hancock County, West Virginia, and for Columbiana County, Ohio.

10. During the week of January 19, 1981, five days of mini-siren testing was conducted. Similar testing was conducted again during the weeks of February 10, 1981, and March 2, 1981.

11. On January 30, 1981, a request for bid for the radio/encoding equipment for siren control was issued. A proposal was received on March 25, and a purchase order issued on April 27. Delivery of the system was projected to be late October. An interim manual system which will be rented to Duquesne Light was received June 19, 1981.

12. On February 20, 1981, representatives of Duquesne Light met with fire department and emergency services personnel in Hancock County to acquaint these personnel with plans for siren installation in Hancock County and to solicit their input and cooperation. A similar meeting was held in Columbiana County, Ohio, on March 12, 1981, with local, county and state officials.

13. In late February 1981, letters were sent to the mayors, the local fire departments and local emergency management agency directors in Beaver County identifying the proposed locations in their respective jurisdications, outlining the Duquesne Light offer to incorporate fire signals and discussing other pertinent aspects of the proposed system. Similar letters were sent to Hancock County, West Virginia, and Columbiana County, Ohio, in March 1981.

14. On April 16, 1981, the purchase order to ACA was revised to provide for 40-125 db and 6-112 db additional sirens. Delivery was projected for late August. The Westinghouse purchase order was also revised.

15. In early June, acceptance tests for the initial siren order were held. Delivery of the initial order of sirens was received June 19, 1981.

16. Right-of-way authorization are presently being obtained from state, municipal and private parties for installation purposes.

Attachment 3

BEAVER VALLEY POWER STATION
Emergency Planning Zone
Emergency Public Waring System

PROJECTED SCHEDULE

NOTE: All projections in this attachment are pending delivery of equipment as expected and with no unforeseen delays such as right-of-way or power supply (Hancock/Columbiana Counties) difficulties.

Milestone	Project date
Delivery of Siren Equipment:	
Initial order	Rec'd June 19
Secondary Order	Late August
Delivery of Interim Siren Control System	Rec'd June 19
Sirens (and 162 mini-sirens) Installed	Late October/ Early November
As sirens are installed, tney will be made operational on the interim control system.	
Permanent Control System Installed	Late November
Remaining Mini-series and Equipment Installed. System Complete	Spring 1982