



## Duquesne Light

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May 6, 1985

United States Nuclear Regulatory Commission  
Washington, DC 20555

ATTENTION: Mr. George W. Knighton, Chief  
Licensing Branch 3  
Office of Nuclear Reactor Regulation

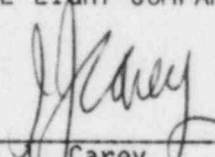
SUBJECT: Beaver Valley Power Station - Unit No. 2  
Docket No. 50-412  
Illumination Levels

Gentlemen:

As requested in a telephone conversation with Division of Human Factors safety representatives on April 10, 1985, Duquesne Light Company is providing a more clearly defined position regarding the illumination issue. This position is attached as a revised response to Question 430.65.

DUQUESNE LIGHT COMPANY

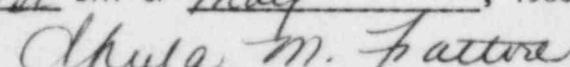
By

  
J. J. Carey  
Vice President

GLB/wjs  
Attachment

cc: Mr. D. H. Beckham, Acting Deputy Director (w/a)  
Mr. R. DeYoung, Director (3) (w/a)  
Mr. W. H. Regan, Acting Branch Chief (w/a)  
Mr. B. K. Singh, Project Manager (w/a)  
Mr. G. Walton, NRC Resident Inspector (w/a)  
INPO Records Center (w/a)  
NRC Document Control Desk (w/a)

SUBSCRIBED AND SWORN TO BEFORE ME THIS  
1st DAY OF May, 1985.

  
Notary Public

8505100254 850506  
PDR ADDCK 05000412  
A PDR

SHEILA M. FATTORE, NOTARY PUBLIC  
SHIPPINGPORT BORO, BEAVER COUNTY  
MY COMMISSION EXPIRES SEPT. 16, 1985  
Member, Pennsylvania Association of Notaries

13001  
1/1

COMMONWEALTH OF PENNSYLVANIA )  
 ) SS:  
COUNTY OF BEAVER )

On this 1st day of May, 1985, before me, a  
Notary Public in and for said Commonwealth and County, personally appeared  
J. J. Carey, who being duly sworn, deposed and said that (1) he is Vice  
President of Duquesne Light, (2) he is duly authorized to execute and file  
the foregoing Submittal on behalf of said Company, and (3) the statements set  
forth in the Submittal are true and correct to the best of his knowledge.

Sheila M. Fattore  
Notary Public

SHEILA M. FATTORE, NOTARY PUBLIC  
SHIPPINGPORT BORO. BEAVER COUNTY  
MY COMMISSION EXPIRES SEPT. 16, 1985  
Member, Pennsylvania Association of Notaries

NRC Letter: September 19, 1983

## Question 430.65 (Section 9.5.3)

You state in Section 9.5.3.1 of the FSAR that the lighting systems provide adequate illumination in all access areas and in all areas required for control of safety-related equipment. This statement is too general. The staff has determined that a minimum of 10 foot-candles at the work station is required to adequately control, monitor, and/or maintain safety-related equipment during accident and transient conditions. For those safety-related areas listed in Requests 430.51 and 430.62, above, and illuminated by the ac and dc lighting systems only, verify that the minimum of 10 foot-candles at the work station is being met. Modify your design as necessary (SRP 9.5.3, Parts I and II).

## Response:

ALL backup emergency lighting subsystems in those areas required for the control of safe shutdown operations has been designated to provide a minimum of 10 foot-candles at the safe shutdown work stations addressed. Calculations verifying this attribute have been performed and completed.

AVERAGE MAINTAINED

As identified in the response to Question 430.61, Amendment 8, all safe shutdown control stations shall have an illuminated level of 10 foot-candles average maintained within the task-seeing areas of these work stations, with power provided from both the onsite nonsafety-related diesel generator and local battery pack units.

In addition, as further identified in Question 430.61, all access and egress paths to safe shutdown control stations shall have an illumination of 1/2 foot-candle average maintained as these paths are determined to be minimum activity and low hazard environments in accordance with Illuminating Engineering Society (IES) guidelines. These paths will have their lighting powered from both the onsite, nonsafety-related diesel generator and local battery pack units.

Task areas in the plant (where activities for equipment maintenance or repair may be required) and access and egress paths thereto, will be illuminated by portable battery powered lighting, readily accessible to operations personnel. Portable lighting facilitates tasks for personnel by providing direct lighting at a proper and adjustable angle on the equipment, minimizing surface shadows which could hinder maintenance or repair.

INSERT A

## INSERT A

With regard to egress lighting, the IES Lighting Handbook, 1981 Application Volume, under "Electric Generating Stations - Emergency Lighting" (p.9-34), reference Section 2, and an IES transaction entitled "Nuclear Power Plant Lighting," published in the Journal of IES, Vol. 5, p. 107, January 1976. In Section 2 of the IES Handbook, "Egress Route Emergency Illumination," illumination recommendations are given on p. 2-47. The IES egress route emergency illumination recommendations are 0.5 fc minimum average maintained at floor level, with a recommended uniformity ratio of up to 20:1, and a maximum uniformity ratio of 40:1 along the center line. The IES handbook also gives certain specific locations within a means of egress such as exit doors and intersections of corridors, where higher levels are recommended. These higher levels (3 fc minimum average maintained) as well as the 0.5fc level will be provided per IES Lighting Handbook recommendations.

The IES recommended safety lighting illumination levels in nuclear power generating stations are given in the aforementioned "Transaction on Nuclear Power Plant Lighting," Table II. General plant pedestrian areas (egress routes) are identified as "slight hazard/low normal activity level" areas. Egress routes are classified as slight hazard areas because, by design, egress routes are unobstructed pathways. However, if any hazards should be identified during lighting system design or the final lighting system design review, they will be illuminated in accordance with Table II guidelines. These illumination levels of 0.5fc and 2fc will be provided for slight and high hazards, respectively, if any, located in the pathway. These levels are absolute minimum at any time, at the hazard, on any plane where safety is related to seeing conditions. The remainder of the egress path will be illuminated to 0.5fc minimum average maintained, with uniformity ratios in accordance with SRP 9.5.3 and the IES Lighting Handbook's egress route emergency illumination recommendations. It should be noted that the 0.5fc minimum average maintained value specified on page 2-47 of the handbook can result in illumination levels at specific points which are less than 0.5fc. Use of Table II ensures that no slight hazard is illuminated to less than 0.5fc and no high hazard is illuminated to less than 2fc regardless of the minimum average maintained illumination for the surrounding area.

Lighting design criteria for access paths will be the same as for egress paths since the visual task, which is the safe movement of personnel through the area, is identical.