



## Duquesne Light

Nuclear Construction Division  
Robinson Plaza, Building 2, Suite 210  
Pittsburgh, PA 15205

2NRC-5-064  
(412) 787-5141  
(412) 923-1960  
Telecopy (412) 787-2629  
April 25, 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  
Fire Protection - Backfit

Gentlemen:

On March 13, 1985, representatives of the NRC, which included Mr. H. Thompson, Director of Licensing, visited the BVPS-2 site to observe the accessibility for fire fighting in the cable spreading and cable tunnel rooms. At the conclusion of this visit, Mr. Thompson indicated that he felt accessibility was demonstrated and he was satisfied with the results.

In addition to the conclusions of this site visit, DLC also consulted recognized experts in the fields of Human Factors and Fire Protection for their professional opinion on accessibility in the cable spreading and cable tunnel rooms. Attached are letters from Dr. Harold Vancott, Essex Corporation (Human Factors expert), and Carl F. Baldassarra, Schirmer Engineering Corp. (Fire Protection expert), containing their assessment. In summary, both individuals feel that adequate access is available for fighting fires in these two areas.

DLC has also been made aware that the NRC assembled a panel of fire protection experts to review specifically the acceptability of CO<sub>2</sub> as a fire suppressant in cable spreading rooms. These fire protection experts concluded:

1. In general, water suppression is preferred for cable spreading rooms.
2. There may be times when gaseous suppression systems by themselves are acceptable for cable spreading rooms.
3. Although the minimum conditions of acceptability for gaseous suppression systems in cable spreading rooms were not determined, it would be acceptable if a plant had:
  - a) an approved alternative or dedicated shutdown system for the cable spreading room or two cable spreading rooms (trains A and B)

8504300436 850425  
PDR ADOCK 050C0412  
F PDR

13002  
11

- b) adequate access and conditions in the cable spreading room for manual firefighting
- c) either a gaseous system or a water system designed in accordance with the intent of NFPA 12 and 13, respectively, irrespective of cable type, coating, trays, etc.

This information further supports DLC's contention that our CO<sub>2</sub> system with fixed hose standpipes as a backup provides an equivalent safe system for the cable spreading and cable tunnel rooms at BVPS-2.

DUQUESNE LIGHT COMPANY

By

J. J. Carey  
Vice-President

ETE/wj  
Attachment

cc: Mr. B. K. Singh, Project Manager (w/a)  
Mr. G. Walton, NRC Resident Inspector (w/a)

COMMONWEALTH OF PENNSYLVANIA )  
 ) SS:  
COUNTY OF BEAVER )

On this 24th day of April, 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.

Phula M. Lattore  
Notary Public

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



March 18, 1985

Mr. E. T. Eilmann  
Senior Project Engineer  
Nuclear Construction Division  
Duquesne Light Company  
Robinson Plaza II, Suite 2  
PA Route 60  
Pittsburgh, Pennsylvania 15205

Dear Mr. Eilmann:

On March 13, 1985 at your invitation (under the General Services Agreement between Duquesne Light Company and the Essex Corporation) I attended an NRC review of the fire protection plan for Beaver Valley Unit 2.

The principal emphasis of that review was on the access of fire fighting personnel to and within lower elevations of the Power Station and particularly to the cable spreading room (EL 725-6), cable tunnel (EL 712-6) and personnel access tunnel (EL 722-6).

The purpose of this letter is to provide you with my assessment of the human factors suitability of these areas for fire fighting personnel.

My observations are based on my inspection of these areas and my viewing of two fully suited fire fighters carrying Scott Airpacks. The two fire fighters were asked to enter and traverse the areas under conditions of normal visibility and while wearing face masks occluded by aluminum foil to simulate the loss of vision that would occur in a dense, smoked filled area.

#### Assessment of General Accessibility.

Under both conditions of unobstructed and obstructed vision neither fire fighter demonstrated any difficulty in entering the cable spreading room, cable tunnel and personnel access tunnel while carrying fire hose.

Access to the cable spreading room requires entrance down a stair-case, movement along an aisle between cable trays which contain two short ramps with stairs, movement in passageways and areas partially blocked by horizontal girders, and movement in low overhead areas which require an individual to stoop sharply in order to reach a given location.

It may also be noted that the narrow width of the cable tunnel required a fully suited fire fighter with airpack to turn side-ways to traverse the tunnel aisle.

The fire fighters used in the accessibility exercise had only been in the cable spreading room and cable tunnel once before the exercise. Despite their lack of familiarity with either area, neither showed any major difficulty in easily moving about in these areas under conditions of full and obstructed vision.

While some improvements could be made to improve the speed and ease of movement and safety to fire fighting personnel, in my opinion these areas are acceptable from a human factors standpoint.

#### Recommended Improvements.

Several relatively modest, low cost modifications could be made to improve the speed and ease of personnel movement.

1. Non-skid surfaces. To reduce the potential for skidding on wet, slippery stair, ramp and walkway surfaces, a non-skid coating could be applied.
2. Reflective tape. Reflective tape strips could be applied to stair rails, aisle centers and other surfaces to increase their visibility and guide movement under conditions of reduced illumination and degraded visibility.
3. Hand-rails. Where handrails do not exist on stairs and ramps, removable rails could be added as a personnel safety measure and as a guide to movement. Easily removable rails would permit rails to be removed for maintenance access.
4. Padding Obstructions. Beams partially obstructing walkways could be padded to reduce the impact of inadvertant collision during movement under conditions of reduced visibility.
5. Communication Between Firefighters. It is recommended that a study be made of light-weight, portable, communications devices for voice communication within a fire brigade. The noise levels that can be expected to occur during fire containment operations may be sufficiently high to mask the audibility of unaided voice communications among fire crew members.

#### Summary.

From a human factors standpoint the cable spreading room, cable tunnel, personnel access tunnel and connecting passages to and between them, permit access by personnel. The only major obstacle to movement

is a ladder which will be replaced by a stair. Five recommendations are made which could facilitate ease and speed of movement and reduce the potential for personnel injury in a fire situation.

Sincerely yours,

*Harold P. Van Cott*

Harold P. Van Cott, Ph.D.  
Vice President & Director  
Systems Operability & Design Group





SCHIRMER ENGINEERING CORPORATION  
707 LAKE COOK ROAD  
DEERFIELD, ILLINOIS 60015-4997  
(312) 272-8340

FIRE PROTECTION ENGINEERS  
SAFETY ENGINEERS  
CODE CONSULTANTS

March 11, 1985

Mr. E. T. Eilmann, P.E.  
Duquesne Light Co.  
Robinson Plaza 2, Suite 210  
PA Route 60  
Pittsburgh, PA 15205

Re: Duquesne Light Co.  
Beaver Valley Station  
Unit 2

Dear Mr. Eilmann:

In accordance with your request, Mr. Gerald R. Schultz of our office surveyed the Unit 2 Cable Spreading Room and interconnecting Cable Tunnel and Switchgear Room as a means of evaluating the accessibility.

The three interconnected rooms are to be protected by a common CO<sub>2</sub> system. In accordance with directives developed by the NRC in the January 29, 1985 meeting, either an automatic water or an automatic gas suppression system is acceptable, if:

1. Separate cable spreading rooms are provided for each train of safety-related/safe shutdown cables, or
2. Dedicated or alternative shutdown capability that is electrically independent from the cable spreading room is provided and good access exists for manual fire fighting activities in the Cable Spreading Rooms.

Schirmer Engineering Corporation was retained by Duquesne Light Co. to address the accessibility issue. Mr. Schultz of our office visited the site on Friday, March 8, 1985, to evaluate the accessibility. Based upon this survey and upon review of the drawings, it became evident that accessibility is adequate with the exception of the northwest corner of the Cable Spreading Room. Due to the quantity and arrangement of trays in this corner, manual fire fighting would be difficult.

From Mr. Schultz's survey, the following items must be evaluated:

1. The facility should evaluate the installation by stretching out the installed hoses to ensure that all areas can be reached. Due to the amount of turns involved, additional hose may be required. We would recommend that a hose be provided in the vicinity of the inaccessible area.
2. The CO<sub>2</sub> system must be designed to maintain a 50 percent concentration throughout for the 20-minute soaking time. An additional nozzle may be required in the area in question. A test probe should be provided in this area during the discharge test.

March 11, 1985

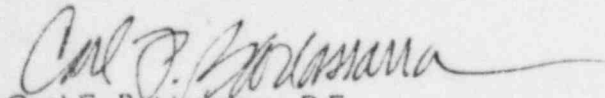
3. It was indicated that approximately 65 percent of the cable trays will be provided with covers. A water spray system will not provide impingement on the cables when a metal cover plate is present. The CO<sub>2</sub> system should be much more efficient.
4. The facility has met with fire fighting specialists and should continue to do so. Fire fighting tactics should be developed from these meetings. Although a fog nozzle is recommended in cable areas, the facility should evaluate the use of a straight stream nozzle on those inaccessible areas.

In conclusion, accessibility is adequate for the three rooms in question. Provided the CO<sub>2</sub> system will maintain the design concentration, the benefit provided by an automatic sprinkler system is not cost-justifiable.

If we may be of any further assistance, please contact me.

Sincerely,

SCHIRMER ENGINEERING CORPORATION



Carl F. Batdassarra, P.E.  
Engineering Manager

mb