June 26, 1991

Docket No. 50-334
Serial No. BV-91-022

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Mr. J. D. Sieber, Vice President
Nuclear Group
Duquesne Light Company
Post Office Box 4
Shippingport, Pennsylvania 15077-0004

Dear Mr. Sieber:

SUBJECT: EXEMPTION FROM GENERAL DESIGN CRITERION 57 - BEAVER VALLEY POWER STATION, UNIT 1 (TAC 75772)

The Commission has issued the enclosed exemption from the requirements of General Design Criterion 57, Appendix A to 10 CFR Part 50 as applied to the recirculation-spray heat exchanger river water radiation monitor sample lines. The exemption allows for the use of local-manual valves in the subject lines for containment isolation vice automatic valves, locked-closed manual valves, or remote-manual valves. The exemption is in response to your request for exemption dated January 11, 1990, as clarified and supplemented by letters dated March 23, 1990 and April 29, 1991.

DLC has committed to include valves RW-615, -621, -627, and -633 in the Technical Specifications [as containment isolation valves] and to test these valves per the requirements of ASME Section XI. Additionally, DLC committed to revise the radiation monitor alarm response procedure. Please provide your schedule for implementing these commitments not later than July 1, 1991.

The requirements of this letter affect fewer than 10 respondents, and therefore, are not subject to Office of Management and Budget review under P.L. 96-511.

Sincerely,

/s/

Albert W. De Agazio, Sr. Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
Exemption

cc w/enclosure:
See next page

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
DUQUESNE LIGHT COMPANY	)	Docket No. 50-334
	)	
(Beaver Valley Power Station, Unit 1)	)	

EXEMPTION

I.

Duquesne Light Company (DLC or the licensee) is the holder of Facility Operating License No. DPR-66 which authorizes operation of the Beaver Valley Power Station, Unit 1 (BVPS-1). This license provides, among other things, that BVPS-1 is subject to all rules, regulations, and Orders of the Commission now or hereafter in effect. BVPS-1 is a pressurized water reactor (PWR) at DLC's site located in Shippingport, Pennsylvania.

General Design Criteria for nuclear power plants are identified in the Commission's regulations in Appendix A to 10 CFR Part 50. These criteria establish minimum requirements for the principal design for water-cooled nuclear power plants. General Design Criterion 57 (GDC 57) states:

> Each line that penetrates primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation. This valve shall be outside containment and located as close to the containment as practical. A simple check valve may not be used as the automatic isolation valve.

The BVPS-1 recirculation-spray heat exchanger (RSHX) river water radiation monitor sample lines do not have a containment isolation valve that is automatic, remote-manual, or locked-closed. Therefore, this configuration does not meet GDC 57, and the updated Final Safety Analysis Report (UFSAR) does not describe this deviation from GDC 57.

By letters dated January 11, and March 23, 1990, and April 29, 1991, DLC requested an exemption for BVPS-1 from the requirements of 10 CFR 50, Appendix A, General Design Criterion 57 pertaining to containment isolation provisions for a closed system inside containment.

II.

DLC and the NRC have been aware of this condition for a long time. On March 25, and April 22, 1980, the staff met with DLC representatives to discuss the consequences of failures and methods to assure integrity of the RSHX. Accordingly, DLC implemented an Inservice Testing (IST) Program consisting of a freon test of the RSHXs tube side every 18 months and periodic testing and calibrating of the radiation monitoring system. The staff granted permission for continued operation of the plant on the basis that this test program and the relatively young life of the system provide reasonable assurance of continued integrity of the RSHXs.

The BVPS-1 containment depressurization system has two subsystems, the quench spray and the recirculation spray, which are designed to cool and depressurize the containment within 60 minutes following a loss-of-coolant accident (LOCA). Four recirculation spray lines take water from the containment sump to provide the necessary cooling and depressurization of the

containment following a LOCA and to maintain subatmospheric pressure in the containment for an extended period following the LOCA. The four RSHXs are cooled by river water. Isolation valves at the RSHX river water inlet and return lines are normally open. During accident conditions, a continuous sample, taken from each heat exchanger river water outlet line upstream of the isolation valve, is monitored for radiation. The sample is returned to the river water discharge line downstream of the isolation valve. DLC has requested exemption from the requirement of GDC 57 for a containment isolation valve meeting the requirements of GDC 57 for each of the four RSHX river water radiation monitor sample lines.

To support the request for exemption, DLC has asserted that the existing plant configuration presents no adverse effect as a result of postulated accidents based on the following considerations:

(1) To release contaminated sump water through the sample line(s) would require a RSHX tube leak. In the event of such a leak, the radiation monitor and the associated high radiation alarm would provide indication of the RSHX tube leak and alert the operator to take corrective action.

(2) Existing operating procedures provide for the shutdown of the recirculation spray pump in the event of a tube leak thus removing the driving force for the tube leak since the containment is subatmospheric. This would provide ample time for the operator to then manually isolate the sample line.

(3) Periodic examinations and tests provided in the IST program can detect any RSHX tube degradation and leakage.

DLC's initial submittal was reviewed and the rationale was found to have merit; however, it did not support adequately an exemption from GDC 57. DLC provided additional information, via letters dated March 23, 1990, and April 29, 1991. DLC identified manual valves, RW-615, 621, 627, and 633 (one for each sample line), to serve as the containment isolation valves, and committed to include these valves in the Technical Specifications (TS) if the exemption is granted. These valves are located at the radiation monitor skid. While there are valves in each sample line that are closer to containment, the post-accident radiation level in the area of those valves is estimated at 3000 R/Hr.

DLC has stated that replacement of these manual valves with automatic or remote-manual valves is not necessary for the following reasons:

(1) These sample lines are normally open and must be open following an accident to allow rapid detection of any radioactive releases resulting from a RSHX tube leak. The radiation monitors, i.e., RM-RW-100A, B, C, and D (one for each sample line), are normally on-line following a LOCA to identify RSHX leakage. If the radiation monitors were isolated automatically or by locked-closed valves, it would take much longer to identify and isolate the leaking RSHX by downstream sampling.

(2) Remote-manual isolation of the sample line has not been provided. However, the existing manual valve can be reached and isolated within 10 minutes by an operator dispatched from the control room. Also, the radiation monitor alarm response procedure will be revised to require closure of these manual valves in case a RSHX tube leak occurred.

(3) The delay in isolation of the sample line attributable to manual operation would not cause a significant radiation release resulting from the design basis accident because the flow rate (4 gpm) of the 1-inch

sample line is approximately one tenth of one percent of the flow rate in the river water line. The flow sampling pumps and the radiation monitors on the sample lines control the flow rate within the 4 gpm limit.

(4) Any leakage from the sample lines would be collected by floor drains and processed by the liquid waste system.

In a conference call held on August 1, 1990, DLC asserted that the estimated cost to install remote-manual valves in the four sample lines would be about $350,000. This estimate includes the costs associated with engineering, materials, and installation of the valves and associated hardware.

In the case of a remote-manual valve, the operators could isolate remotely the appropriate sample line in response to the radiation alarm within a minute of the alarm. Considering that the local manual valve can be reached and closed within 10 minutes of a radiation alarm, the staff concludes that the additional radiation leakage through the 1 inch (4 gpm) sample line would be small. The staff, therefore, has concluded that requiring the installation of remote-manual valves in lieu of the existing manual valves are unwarranted when compared to the costs for installing the remote-manual valves.

For an automatic valve, DLC addressed only the use of containment isolation signals for valve closure. The staff agrees that the sample line should function during post-LOCA conditions and standard containment isolation signals are not applicable. However, if the isolation signals were associated with the radiation level in the sample line, an automatic valve would be superior to a remote-manual valve in two aspects. First of all, isolation

would occur faster and second there would be no need for operator action. However, as discussed for remote-manual valves, the staff concludes that the radiation leakage through a sample line which would occur as a result of the difference in times between the isolation of a local manual and an automatic valve would be small. Furthermore, automatic isolation of the sample lines could not be justified without also requiring automatic isolation of the 14 inch RSHX river water lines for which the staff has previously accepted remote-manual valves.

As in the case of the remote-manual valves, the staff evaluated the costs to install automatic isolation valves in the sample lines. The staff did not ask DLC for cost data for automatic isolation valves; however, the staff found that the costs would be at least as great as for installing remote-manual valves. Therefore, the staff concludes that the costs for installing automatic isolation valves in lieu of the existing manual valves are not justified considering the safety benefit to be gained.

In evaluating the acceptability of DLC's position, the staff questioned the accessibility and radiation doses which would be incurred when isolating the local manual valve following an accident. In the conference call on August 1, 1990, DLC stated that the manual valves would be accessible and the worse case whole body radiation dose which would be received by personnel when isolating the valve would be 5 rems. The staff considers this to be acceptable since it is below the 10 CFR Part 100 limits for emergency conditions.

In addition, the staff considered the fact that the containment is maintained at subatmospheric pressure to minimize radioactive releases and the plant operating procedures require the shutdown of appropriate recirculation

spray pumps to stop any leakage. These features would reduce radiation releases while the operators manually isolate the sample lines during either normal or accident conditions.

Based on evaluation of the information provided by DLC as discussed above and the fact that DLC performs periodic examinations and tests, through the IST program, to detect any degradation and tube leakage of the RSHX, the staff concludes that DLC has provided adequate justification for the integrity of the sample lines with the current isolation configuration . The staff concludes that the sample lines should remain open to detect any radiation leakage through the RSHX and not be locked-closed. The existing local manual valves would be accessible for local isolation during accident conditions, and the installation of remote-manual or automatic isolation sample line valves is not warranted based on cost-safety benefit considerations. The staff also concludes that the subject valves should be included in the Appendix J Type C testing program since they have been designated as containment isolation valves for the sample lines.

III.

The Commission has determined, pursuant to 10 CFR 55.11, that this exemption is authorized by law and will not endanger life or property and is otherwise in the public interest. Furthermore, the Commission has determined that the special circumstances of 10 CFR 50.12(a)(2)(ii) are applicable in that application of GDC 57 in this instance is not necessary to achieve its underlying purpose. The use of locked-closed valves to isolate the sample lines

would result in delay in isolating a radiation release due to a leaking RSHX tube, and the use of local manual valves will not result in a significant increase in the total offsite radioactivity release.

Further, the Commission has determined that the circumstances of 10 CFR 50.12(a)(2)(iii) are applicable in that the application of the rule would result in undue costs that are significantly in excess of those contemplated when the regulation was adopted. The use of automatic or remote-manual valves would result in undue cost in comparison to the safety benefit to be derived.

The Commission hereby grants an exemption from General Design Criterion 57 with respect to the isolation provisions for the RSHX river water radiation monitor sample lines.

Pursuant to 10 CFR 51.32, an environmental assessment and finding of no significant impact has been prepared and published in the Federal Register on June 10, 1991 (56 FR 26699). Accordingly, based upon the environmental assessment, the Commission has determined that the issuance of this exemption will not have a significant effect on the quality of the human environment.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/S/

Steven A. Varga, Director
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 26day of June 1991.

*SEE PREVIOUS CONCURRENCE

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