Duquesne Light

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April 18, 1984

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
Responses to NRC Chemical Technology Section Draft SER
Outstanding Issues

Gentlemen:

On March 13, 1984, DLC met with the NRC Chemical Engineering Branch-Chemical Technology Section to discuss the draft SER open items related to this section. These are indicated as Open Item Nos. 78 through 81 in Table 1.2 of the draft SER. Based on the discussion at this meeting, responses to these open items have been prepared and are provided in Attachment 1. The associated revisions to FSAR Section 9.3.2.3 and the response to NRC Question 281.4 are provided in Attachment 2. These revisions will be incorporated into FSAR Amendment 7.

Based on the aforementioned meeting, it is DLC's understanding that this submittal closes draft SER Open Items 78 through 81, unless further notification indicating otherwise is received from the NRC.

DUQUESNE LIGHT COMPANY

By E. J. Woolever
E. J. Woolever
Vice President

JDO/wjs
Attachments

cc: Mr. G. Walton, NRC Resident Inspector (w/a)
Mr. M. Lacitra, Project Manager (w/a)

A001
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SUBSCRIBED AND SWORN TO BEFORE ME THIS
17th DAY OF April, 1984.

Elva G. Lesondak
Notary Public

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

On this 17th day of April, 1984, before me, a Notary Public in and for said Commonwealth and County, personally appeared E. J. Woolever, 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.

Elva G. Lesondak
Notary Public

ELVA G. LESONDAK, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

ATTACHMENT 1

Open Item No. 78 (SER 9.3.2.2)

Procedure to estimate extent of core damage.

Response:

Refer to the revised response provided for FSAR Question 281.4, Part 1 (Attachment 2).

Open Item No. 79 (SER 9.3.2.2)

Backup post-accident sampling through grab samples for inline analyses

Response:

Refer to revised FSAR Section 9.3.2.3.2 (page 9.3-24, Attachment 2).

Open Item No. 80 (SER 9.3.2.2)

Measuring radionuclide concentrations

Response:

Refer to the revised response provided for FSAR Question 281.4, Part 3 (Attachment 2).

Open Item No. 81 (SER 9.3.2.2)

Performance of PASS instrumentation and analytical procedures

Response:

Refer to the revised response provided for FSAR Question 281.4, Part 2 (Attachment 2).

ATTACHMENT 2

BVPS-2 FSAR

NRC Letter: August 31, 1983

Question 281.4 (Section 9.3.2.3, SRP 9.3.2)

1. Provide a core damage estimate procedure to include radionuclide concentrations and other physical parameters as indicators of core damage. Attachment 1 provides an acceptable methodology for preparing plant specific core damage procedures.

2. Provide information demonstrating applicability of procedures and instrumentation in the post-accident water chemistry and radiation environment, and retraining of operators on semi-annual basis. Indicate the measurement accuracy of each chemical and radiological analysis. Guidance for analytical chemistry procedure is enclosed as Attachment 2.

3. Show how clarification (9) in Item II.B.3 of NUREG 0737 is met.

Response:

1. BVPS-2 will adopt the final version of the Westinghouse Owners Group post-accident core damage assessment methodology which is currently being reviewed by the NRC. When the final version of this generic methodology is available, the necessary adjustments in parameter values will be made and the BVPS-2 plant specific procedure will be prepared. In the meantime, BVPS-2 will adopt the latest available draft version of the Westinghouse Owners Group methodology.

2. Refer to revised Section 9.3.2.3.2 and new Table 9.3-11 for the Post-Accident Sampling System (PASS) parameter ranges and accuracies.

   Following their initial training, PASS operators will be retrained on a semi-annual basis to ensure their familiarity with the system operations and procedures.

   PASS instrumentation will be calibrated on a semi-annual basis.

3. An isotopic analysis will be performed using a Germanium detector connected to a computer-based multichannel analyzer. The PASS has the capability to dilute both liquid and gas samples for isotopic analysis. Further dilutions, if necessary, could be performed in the laboratory. The accuracy of the method of performing an isotopic analysis for post-accident samples is considered to be $\pm$ 50%.

return samples to various locations commensurate with sampling conditions.

The following post-accident sampling points have been included in the PASS design:

1. Primary coolant hot leg sample (four points),
2. Residual heat removal heat exchanger outlet sample (two points),
3. Reactor containment sump sample,
4. Reactor containment atmosphere sample,
5. Safeguards area sump sample (two sumps),
6. Auxiliary building sump sample (four sumps),
7. Pipe tunnel sump sample (one sump), and
8. Recirculation spray pump discharges.

The following sample return points will be utilized for each of the sampling conditions indicated:

1. Normal plant operation:
   a. Primary drains transfer tank (auxiliary building), and
   b. Volume control tank.
2. Post-accident operation:
   a. Pressurizer relief tank, and
   b. Reactor containment sump.

Samples not analyzed on-line in the PASS panel will be analyzed via grab samples at the shared BVPS-1/BVPS-2 emergency response facility laboratory that is onsite. Backup sampling capability, via grab samples, exists for all on-line analyses.

The following accident sampling analyses will be provided within 3 hours or less from the time a decision is made to sample, except for chloride which will be provided within 4 days:

1. Primary coolant and sump samples:

   a. Gross activity - provided as an on-line capability at the PASS panel,

   b. Gamma spectrum (isotopic analysis) - at the emergency response facility,

   c. Boron content - provided as an on-line capability at the PASS panel,

   d. Chloride content - provided as an on-line capability at the PASS panel,

   e. Dissolved H_2 or total dissolved gas, and O_2 - provided as an on-line capability at the PASS panel (reactor coolant only), and

   f. pH - provided as an on-line capability at the PASS panel.

2. Containment atmosphere sample:

   a. Hydrogen content - provided as an on-line capability in the combustible gas control system (Section 6.2.5),

   b. Oxygen content - provided as an on-line capability at the PASS panel, and

   c. Gamma spectrum (isotopic analysis) - at the emergency response facility.

Sample analyses ranges are in accordance with the requirements of Regulatory Guide 1.97 for type E variables.

The PASS panel consists of a shielded panel with internal capability for on-line analysis, as previously described, and shielded grab sample acquisition capability.

Operators manipulate panel control equipment at the panel-front, admitting samples for on-line analysis and/or grab sample collection.

The PASS panel collects sample drains and routes them back to the plant through various systems (Figure 9.3-11). The PASS panel is located in the auxiliary building at el 735 ft-6 in in an area accessible to personnel under all plant operating conditions.

The following delineates the specific methods utilized to route each of the individual samples required to the PASS panel (Figures 9.3-11 and 9.3-12):

1. Primary coolant hot leg samples

Sample analysis accuracies and ranges for the PASS are given in Table 9.3-11.

TABLE 9.3-11

POST-ACCIDENT SAMPLING SYSTEM PARAMETER RANGES AND ACCURACIES

Parameter	Range	Accuracy
Liquid Samples		
Isotopic activity	1 uCi/ml to 10 Ci/ml	Factor of 2
Boron content	0 to 6000 ppm	$\geq$ 1000 ppm: $\pm$ 5% of measured value < 1000 ppm: $\pm$ 50 ppm
Chloride content	0 to 20 ppm	$\geq$ 0.5 ppm: $\pm$ 10% of measured value < 0.5 ppm: $\pm$ 0.05 ppm
Dissolved hydrogen or total dissolved gas	0 to 2000 cc (*STP)/kg	$\geq$ 50 cc/kg: $\pm$ 10% of measured value < 50 cc/kg: $\pm$ 5 cc/kg
Dissolved oxygen	0 to 20 ppm	$\geq$ 0.5 ppm: $\pm$ 10% of measured value < 0.5 ppm: $\pm$ 0.05 ppm
pH	1 to 13	$\geq$ 5 to $\leq$ 9: $\pm$ 0.3 pH units < 5 or > 9: $\pm$ 0.5 pH units
Gaseous Samples		
Oxygen content	0 to 30% by volume	$\pm$ 10% of scale
Isotopic content	1 uCi/ml to 10 Ci/ml	Factor of 2

NOTE:

*STP - 0°C and one atmosphere