



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 27 1984

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Docket No. 50-412

MEMORANDUM FOR: ~~Thomas A. Noyak, Assistant Director~~
for Licensing
Division of Licensing

FROM: William V. Johnston, Assistant Director
Materials, Chemical & Environmental Technology
Division of Engineering

SUBJECT: SAFETY EVALUATION REPORT FOR BEAVER VALLEY POWER STATION,
UNIT No. 2

Plant Name: Beaver Valley Power Station, Unit No. 2
Suppliers: Westinghouse Electric Corporation; Duquesne Light Company
Licensing Stage: OL
Docket No.: 50-412
Responsible Branch and Project Manager: LB #3; M. Ley
Reviewers: J. Wing, B. Turovlin
Description of Task: Operating License Review
Status: SER Complete - Two open items

In our Draft Safety Evaluation Report, we concluded that Sections 6.1.1, 6.1.2, 9.1.2, 9.1.3, 9.3.2A, 9.3.4, 10.3.5, 10.4.1, 10.4.6 and 10.4.8 were acceptable. Section 9.3.2B (Post-Accident Sampling) met seven of the eleven criteria in Item II.B.3 of NUREG-0737.

By letter dated April 18, 1984, the applicant provided additional information. Enclosed is our safety evaluation. Based on our evaluation, we now conclude that nine of the eleven criteria in Item II.B.3 of NUREG-0737 are met. Section 9.3.2B should be replaced with the attached evaluation. All other sections in the draft safety evaluation remain unchanged.

Input for the SALP process is also enclosed.

William V. Johnston

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Enclosures: As stated

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Safety Evaluation Report
by the Office of Nuclear Reactor Regulation
for Duquesne Light Company
Beaver Valley Power Station, Unit No. 2
Docket No. 50-412

9.3.2 Process and Post-Accident Sampling Systems

B. Post-Accident Sampling System (NUREG-0737, II.B.3)

Introduction

In our draft safety evaluation, we concluded that the post-accident sampling system met seven of the eleven criteria in Item II.B.3 of NUREG-0737. The four criteria which were unresolved are:

- (2) Provide a plant specific procedure to estimate the extent of core damage.
- (8) Provide backup sampling capability via grab samples.
- (9) Provide capability to measure radionuclide concentrations in the range of 1 $\mu\text{Ci/g}$ to 10 Ci/g with an error of a factor of 2.
- (10) Provide information on the accuracies, sensitivities, and performance of the PASS instrumentation and analytical procedures in the post-accident water chemistry and radiation environment. Provide the frequency for demonstrating operability of procedures and instrumentation and retraining of operators on semi-annual basis.

By letter dated April 18, 1984, the applicant provided additional information.

Evaluation

Criterion (2):

The applicant shall establish an onsite radiological and chemical analysis capability to provide, within the three-hour time frame established above, quantification of the following:

- a) certain radionuclides in the reactor coolant and containment atmosphere that may be indicators of the degree of core damage (e.g., noble gases, iodines and cesiums, and non-volatile isotopes);
- b) hydrogen levels in the containment atmosphere;
- c) dissolved gases (e.g., H_2), chloride (time allotted for analysis subject to discussion below), and boron concentration of liquids;
- d) alternatively, have in-line monitoring capabilities to perform all or part of the above analyses.

The PASS provides for in-line analysis of the reactor coolant and containment sump samples for total dissolved gas and oxygen, pH, chloride and boron concentrations, and gross radioactivity. Hydrogen and oxygen in containment air are analyzed by in-line instrumentation. Radionuclide gamma spectrum analysis will be performed via grab samples at the onsite emergency response facility laboratory.

The applicant will adopt the Westinghouse Owners Group post-accident core damage assessment methodology.

We determined that these provisions partially meet Criterion (2) of Item II.B.3 in NUREG-0737. The applicant should provide a plant-specific procedure for estimating the degree of core damage.

Criterion (E):

If in-line monitoring is used for any sampling and analytical capability specified herein, the applicant shall provide backup sampling through grab samples, and shall demonstrate the capability of analyzing

the samples. Established planning for analysis at offsite facilities is acceptable. Equipment provided for backup sampling shall be capable of providing at least one sample per day for 7 days following onset of the accident and at least one sample per week until the accident condition no longer exists.

The PASS provides in-line analyses for gross radioactivity, boron, chloride, dissolved gases, and pH in reactor coolant and containment sump, and hydrogen and oxygen in containment air. Backup sampling capability through grab samples is available for these in-line analyses.

We find that these provisions meet Criterion (8) and are, therefore, acceptable.

Criterion (9):

The applicant's radiological and chemical sample analysis capability shall include provisions to:

- a) Identify and quantify isotopes of the nuclide categories discussed above to levels corresponding to the source term given in Regulatory Guides 1.3 or 1.4 and 1.7. Where necessary and practicable, the ability to dilute samples to provide capability for measurement and reduction of personnel exposure should be provided. Sensitivity of onsite liquid sample analysis capability should be such as to permit measurement of nuclide concentration in the range from approximately 1 $\mu\text{Ci/g}$ to 10 Ci/g.
- b) Restrict background levels of radiation in the radiological and chemical analysis facility from sources such that the sample analysis will provide results with an acceptably small error (approximately a factor of 2). This can be accomplished through the use of sufficient shielding around samples and outside sources, and by the use of a ventilation system design which will control the presence of airborne radioactivity.

The radionuclides in both the primary coolant and the containment atmosphere will be identified and quantified. Provisions are available for diluted reactor coolant samples to minimize personnel exposure. The PASS can perform radioisotopes analyses at the levels corresponding to the source terms given in Regulatory Guides 1.4, Rev. 2 and 1.7. These analyses will be accurate within a factor of two. We find that these provisions meet Criterion (9) and are, therefore, acceptable.

Criterion (10):

Accuracy, range, and sensitivity shall be adequate to provide pertinent data to the operator in order to describe radiological and chemical status of the reactor coolant system.

The accuracy, range, and sensitivity of the PASS instruments and analytical procedures are consistent with the recommendations of Regulatory Guide 1.97, Rev. 3, and the clarifications of NUREG-0737, Item II.B.3, Post-Accident Sampling Capability, transmitted to the applicant on August 31, 1983. Therefore, they are adequate for describing the radiological and chemical status of the reactor coolant. Equipment used in post-accident sampling and analyses will be calibrated or tested at least every six months. Retraining of operators for post-accident sampling is scheduled at a frequency of once every six months. We determined that these provisions partially meet Criterion (10). The applicant should provide information on the performance of the PASS instrumentation and analytical procedures in the post-accident water chemistry and radiation environment.

Conclusion

We conclude that the post-accident sampling system meets nine of the eleven criteria in Item II.B.3 of NUREG-0737. The following two criteria are unresolved:

- (2) Provide a plant specific procedure to estimate the extent of core damage.
- (10) Provide information on the performance of the PASS instrumentation and analytical procedures in the post-accident water chemistry and radiation environment.

Input to the SALP Process

A. Functional Area: Chemical Technology

1. Management involvement in assuring quality

Throughout the review process, the applicant's activities exhibited evidence of prior planning. Policies for quality assurance of protective coating systems were adequately stated and understood.

Rating: Category 2

2. Approach to resolution of technical issues from a safety standpoint

The applicant's approach to resolution of the post-accident sampling capability and secondary water chemistry displayed clear understanding of our concern. Conservatism was generally exhibited. The issues were resolved in a viable and sound manner.

Rating: Category 2

3. Responsiveness to NRC initiatives

The licensee frequently requires extensions of time to respond to our request for additional information. There are still a number of unresolved issues.

Rating: Category 3