



Duquesne Light

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January 17, 1986

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
Design Verification Activities

- References:
- 1) Duquesne Light Company Nuclear Construction Division Presentation to the Nuclear Regulatory Commission, Region I, King of Prussia, PA, dated October 21, 1983
 - 2) NRC Region I SALP Audit, 50-334/84-13 and 50-412/84-06, dated May, 1984 (Section 4-10)
 - 3) NRC Region I Inspection Reports 50-412/84-14, dated October 31, 1984 and 50-412/85-21, dated November 22, 1985
 - 4) NRC Region I Inspection Report 50-412/85-07, dated June 7, 1985
 - 5) NRC Region I Inspection Report 50-412/85-99, dated June 7, 1985
 - 6) NRC ACRS Report, dated November 1, 1985, "Advisory Committee on Reactor Safeguards Subcommittee on Beaver Valley Power Station Unit No. 2 (pages 144 and 145)
 - 7) NRC Letter to Duquesne Light Company, "Design, Verification Activities - Beaver Valley 2", dated November 22, 1985

Dear Mr. Thompson:

In your letter of November 22, 1984 (Reference #7), Duquesne Light Company (DLC) was requested to "... present any plans you have for assuring that your plant has been designed in accordance with FSAR commitments and NRC regulations." The purpose of this letter is to provide a detailed response to the above request, identifying the actions taken in the past and activities which are in process or scheduled for providing strong assurance that BVPS-2 has been designed in accordance with FSAR commitments and NRC regulations.

With awareness of methods in general use within the Nuclear Industry to demonstrate that the design process meets all applicable requirements, DLC has initiated multiple programs. These include design reviews utilizing independent outside contractors for specific tasks, utilizing in-house DLC engineering personnel with nuclear plant experience for in-depth reviews, and utilizing Stone and Webster Engineering Corporation (SWEC) engineering personnel and engineering assurance programs for in-depth and overall program reviews. All of these reviews and programs have been controlled and are auditable. A number of these programs have been formally presented to the NRC and are as follows:

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1. Engineering Confirmation Program - (Reference #1)

This program was developed in the second quarter of 1983 and was formally presented to the NRC Region I on October 21, 1983. The program, a joint DLC/SWEC effort, included the following objectives utilizing DLC engineers and SWEC project engineering personnel:

a) DLC

- o Endorse the Plant Design Bases
- o Implement the Engineering Charter and provide additional engineering procedures
- o Define the "As-Built" program

b) SWEC

- o Confirm the adequacy of engineering information
- o Assure consistency of information
- o Confirm Design Criteria and Licensing Document Correlation
- o Scope and schedule "As-Built" program
- o Strengthen design interface and design control implementation

The DLC portion has been completed in the DBE program (see item #2, below) with continuing efforts in a defined follow-on program. Engineering personnel have been in-place and procedures have been developed and are being implemented. The "As-Built" program has been defined and is in process of implementation compatible with schedule and document releases.

The SWEC portion is parallel and integrated with the DLC DBE program (see item #2, below). All objectives have been met or are in process, as scheduled. The "As-Built" program has been defined and integrated with design and construction activities.

2. Design Bases Endorsement Program

This program, an integral part of the Engineering Confirmation Program, was initiated by DLC in March, 1983, to provide a thorough documented review and evaluation which led to the endorsement of SWEC Design Criteria Documents and Confirmation of SWEC Design Process and Control Documents. Included in this program was review and evaluation of design output documents and validation of key attributes of the installed design for selected, sample systems. Comments developed by the DLC review were resolved mutually between DLC and SWEC, involving 48 DLC engineers for approximately 11,000 man-hours and involving approximately 50 SWEC engineers.

The completion of this program in June, 1984, as documented in an auditable DLC report, concluded that the DLC Design Bases Endorsement (DBE) Program has demonstrated that the BVPS-2 Plant Design Bases, as defined in this report, have no significant unresolved concerns and are considered acceptable by DLC. The program enabled DLC to effectively identify potential design discrepancies. Each of these has been addressed and either resolved to DLC's satisfaction or included in a follow-on program which is expected to result in a satisfactory resolution.

As a continuing function, follow-on activities were formally established by DLC in August, 1984, with DLC direct involvement and control.

The NRC Region I periodically reviewed and/or audited the DBE program and portions of the Engineering Confirmation (References #2, #3 and #5). In particular, the NRC Region I stated that they found the Engineering Confirmation Program and Design Bases Endorsement Program to be thorough. The following is a quote from Reference #5, Section 9:

"The Duquesne Light Company (DLC) manpower commitment has been substantial. An example of such commitment is illustrated by the expenditure of approximately 11,000 man-hours by forty-eight DLC engineers in completing the Design Bases Endorsement effort of the "Engineering Confirmation Program" with the major conclusion drawn that DLC has no unresolved concerns with Beaver Valley Power Station - Unit No. 2 Plant Design Bases. NRC found this effort to be thorough. DLC did identify some specific design discrepancies, but these are being resolved with Stone and Webster through an effective follow-on program."

3. Engineering Assurance Program

The SWEC Engineering Assurance Division (EA) has completed two special in-depth technical audits of the BVPS-2 design process to verify that various plant systems are consistent with licensing commitments with a third audit of this type currently in progress. These special in-depth audits involve highly qualified personnel independent of the BVPS-2 project and include all appropriate engineering disciplines. The purpose, scope and conduct of a collection of such audits is similar to an IDI or IDVP. Similar audits for other SWEC designed nuclear units have been found by the NRC Staff to be acceptable alternatives to an IDI or IDVP. One of the technical audits was reviewed by the NRC special inspection team that conducted the most recent CTI in March, 1985, and was cited as a strength for BVPS-2

(Reference #4). The following is quoted directly from Appendix B, Part B of Reference 4:

"Part B:

- (3) The engineering audit EA-319 was found to be exceptionally technical in nature and scope. It involved SWEC engineering specialists from several divisions/departments in addition to SWEC engineering assurance personnel, thus providing additional scope and technical depth. The audit responses were required to be thorough as evidenced by the depth of response, evaluation and follow-up actions (Section 4.2.4.2)."

One of these in-depth, EA technical audits remains to be performed at BVPS-2 and is currently scheduled to commence in April, 1986. This audit will involve a design review of a safety related system and associated systems and structures. Selected site activities relating to the design of this system will be included in the scope of the audit. The results of the four in-depth technical audits discussed above will be analyzed in a summary report which is scheduled to be completed by November, 1986. This report is expected to document the bases for concluding that the BVPS-2 design and design process have satisfactorily addressed applicable regulatory requirements.

4. DLC Quality Assurance Program

DLC is responsible for overall quality assurance functions associated with BVPS-2 and major BVPS-2 contractors. The DLC QA program is extensive and involves independent reviews and verification of all phases of the design, engineering, construction, and operation of the BVPS-2 plant. The NRC has evaluated this QA program in many instances and determined it to be adequate and in compliance with applicable regulatory requirements. Conclusions of the adequacy of the BVPS-2 Program are noted in the most recent Construction Team Inspection (Reference #4), and the most recent NRC Systematic Assessment of Licensee Performance (Reference #5).

5. Other BVPS-2 Programs

In addition to the above program efforts, the other BVPS-2 programs which are intrinsic to the BVPS-2 engineering and design process, provide an additional verification of adequacy of that process. These programs include the following:

- a) Fluid Systems Design Review of entire plant mechanical items conducted by outside contractor in support of DLC Mechanical Engineering Department during 1978 (50,000 man-hours).
- b) Fluid System Design Finalization Program (1980 through 1982) which addressed plant operations, startup, and maintenance concerns identified in BVPS-1 and their application to BVPS-2 plant systems design. Also included were proper applications of later industry codes and standards and regulatory requirements.
- c) Establishment and resolution of the "BVPS-2 Open Items List" as a follow-on to the Fluid System Finalization Program, as well as including open design items in other disciplines (licensing, electrical, structural, etc.). A separate open items list was developed for Westinghouse Electric Corporation NSSS supplied items. This program was initiated in March, 1982 and completed in July, 1984, with resolution for all (375) items.
- d) Design reviews utilizing independent outside contractors for specific design assessments, verifications and reviews were conducted during the period 1982-1984. These included the following programs:
 - o Review of Equipment Qualification Program - NUS
 - o Review of Hydrogen Recombiner Adequacy - Quadrex and Duke Power
 - o Review of the ASME Program - Duke Power, Teledyne & R. L. Cloud Associates
 - o Review of the Site Engineering Processes - Duke Power
 - o Review of BVPS-2 Soil Structure Interaction and Site Specific Response Spectra - Team of Five DLC Consultants and Several SWEC Consultants

These independent design reviews resulted in confirming that the plant design bases and the regulatory commitments are consistent and coordinated.

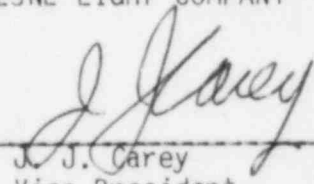
Involvement of DLC has been significant in the Design Finalization Program through the evolution to the BVPS-2 Open Items List and to the present Design Change Control Program. Personnel from DLC Engineering Departments and DLC Startup Group interfaced with various SWEC engineering disciplines and Westinghouse Corporation for approximately 4.5 years with more than 20 man-years (40,000 man-hours) of effort.

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In conclusion, DLC has instituted an extensive and diverse set of programs that fulfill the NRC's request for additional assurance that BVPS-2 has been designed and constructed in full compliance with applicable commitments and regulations. Due to the historically high costs associated with IDI/IDVP efforts, DLC must ensure that such expenditures are prudent and are justified by regulatory requirements or by potential positive impacts on the project in its late stages of construction. For the reasons cited above, DLC firmly believes that an additional effort utilizing an IDI or IDVP is unwarranted. This conclusion was apparently endorsed in comments by the NRC Staff in the recently concluded BVPS-2 ACRS Meeting (Reference 6, Pages 144 and 145). We trust that the requirements of 10CFR50.54(f) will be appropriately applied by the staff if an IDI or IDVP is found to be necessary.

DUQUESNE LIGHT COMPANY

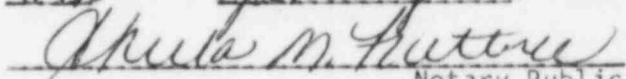
By


J. J. Carey
Vice President

JRH/slm

cc: Mr. P. Tam, Project Manager
Mr. G. Walton, NRC Resident Inspector

SUBSCRIBED AND SWORN TO BEFORE ME THIS
10th DAY OF January, 1986.


Notary Public

SHEILA M. HUTTER, NOTARY PUBLIC
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