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JUL 12 1984

Docket No. 50-454
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Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

We have reviewed the first (May 1984) and second (June 1984) Interim Reports of the Independent Design Review of Byron Station performed by Bechtel Power Corporation and have the comments contained in the attachment to this letter. We intend to review the final report when issued to assure these comments have been addressed in that document. No response to this letter is required.

Sincerely,

"Original Signed by J. Streeter"

J. F. Streeter, Director
Byron Project Division

Attachment: As stated

cc w/attach:

- D. L. Farrar, Director
of Nuclear Licensing
- V. I. Schlosser, Project Manager
- Gunner Sorensen, Site Project
Superintendent
- R. E. Querio, Station Superintendent
- DMB/Document Control Desk (RIDS)
- Resident Inspector, RIII Byron
- Resident Inspector, RIII Braidwood
- Phyllis Dunton, Attorney
General's Office, Environmental
Control Division
- Ms. Jane M. Whicher
- Diane Chavez, DAARE/SAFE
- S. Lewis, FID

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COMMENTS ON INTERIM REPORTS DATED MAY AND JUNE 1984
OF BECHTEL INDEPENDENT DESIGN REVIEW OF BYRON STATION

May 1984 Interim Report

1. Page iii states that the electric power supply was reviewed for the three systems selected for review. The report appendices provide no evidence of such review for the essential service water (ESW) system and the component cooling water (CCW) system.
2. Page iv and page 3 state that Bechtel planned to review the selected systems initially on an overall basis to determine which areas should receive the greatest attention and that these areas would be reviewed in greater depth in the later stages of the review. We consider this an important step for ensuring an in-depth review of the design process. The report provides no indication that such areas were identified.
3. Page 2 states that the IDR covered Sargent & Lundy (S&L) design work completed through April 1, 1984, but some S&L work in progress was considered after this date. Unless the report clearly recognizes each case, it is inappropriate to include in the IDR S&L work in progress after the cutoff date.
4. Page 9 states that for Observation Report 8.2 a review of calculations for the river screenhouse structural steel indicated that a column baseplate may be overstressed. S&L provided the IDR team with recent calculations which confirmed the base plate adequacy. The report does not address why the original S&L calculation did not result in identification of an over-stress condition.
5. Page 13 states that Observation Report 8.5 on river screenhouse seismic analysis has limited significance since the S&L system provides for routinely making reviews for such analysis. The report does not address why the routine S&L reviews did not identify the fact that reinforced concrete portions of the structure and piping and equipment components had not been reviewed for higher loads based on a revised seismic analysis.
6. Page 16 states that for Observation Report 8.10 there was no verification of actual battery loads. The report states this is not safety significant because of "evidence of procedures and actions to review battery loads." However, the IDR has not confirmed that such "procedures and actions" were in fact implemented for the 125 V dc system. The IDR should base its findings on the design product rather than on the existence of procedures.
7. Page 18 states that several of the observations involve inconsistencies between documents or FSAR commitments that are not literally met. The report does not address whether this problem is pervasive, and accordingly does not address root causes and extent of the problem. Since five of the eight observations discussed in the report relate to the problem of FSAR discrepancies, the report should address whether the problem is pervasive, and, if so, the action taken to determine the root causes and correct the problem.

8. Page 23 states that the adequacy of Westinghouse and NPS designs was excluded from this review, although the review did include the implementation of Westinghouse requirements by S&L and S&L requirements by NPS. The report should address why such reviews should not go beyond mere implementation of requirements in documents (e.g., P&IDs, design procedures) and extend to the design product such as calculations and detail drawings.
9. Page A.2-2 indicates that the 3/4' anchor is acceptable because it has a factor of safety "practically equal to 4," whereas factors of safety are normally above 4. The report should be precise with respect to acceptance criteria and the technical basis for accepting values below the acceptance criteria.
10. Comment 7 above refers to five observations relating to FSAR discrepancies. Page A.2-5 indicates the FSAR imprecisely states a valve throttling rather than an isolation function. This was not identified by the IDR as an observation, and is therefore not included in the population of observations related to FSAR discrepancies. The report should explain the exclusion.
11. The Piping Engineering reviews merely indicate that S&L design specifications incorporate ASME code requirements. These reviews should go further to evaluate designs and analyses which implement the design specifications.
12. The Plant Design reviews address high energy pipe whip impact effects on piping in the CCW and ESW systems. However, these reviews do not address jet impingement effects or the effects on all components, equipment and structures for all systems in the target zone of the pipe break. These reviews also appear to represent Bechtel's independent review rather than an assessment of S&L's review. The report should present an assessment of S&L's work in this area.
13. Page B.2-2 states that Calculation 2.1.1.16 misleadingly infers an under-designed condition, but that revised cross sections (acceptable) are included in Calculation 2.1.1.17. The report should address whether there are deficiencies in the design process indicated by Calculation 2.1.1.16.
14. Page B.2-4 states that the factor of safety against flotation, overturning, and sliding shall be 1.1 minimum, and that based on Calculation 2.1.2.1 the factor of safety under various loading conditions exceeded 1.2. The acceptance criterion cited by the report is inconsistent with SRP 3.8.5 (page 3.8.5-7) which states that under certain load combinations minimum factors of safety for overturning and sliding are 1.5. The report should explain the apparent discrepancy.
15. Page B.3-1 states that new seismic response spectra and forces were transmitted from the Structural Analysis Division to the Structural Engineering Division through controlled criteria DC-ST-04-BB and that the Structural Engineering Division failed to provide evidence of reviewing the reinforced concrete and piping/components calculations for the increased loads. The report does not address generic implications. The report should address the review of other systems to determine if current seismic loads are used in analyses or should provide a justification for not conducting such reviews.

16. Page C.2-10 states that no random loads were identified. It is not clear whether this indicates that there are no random loads or S&L failed to identify them in its analysis. The report should clarify this matter.
17. Pages C.2-12 and C.3-2 state that battery qualified life is reduced because of the higher battery area temperature. The report should clarify why the reduced battery qualified life is considered acceptable.
18. Page C.3-3 identifies inconsistencies in design documents pertinent to the DC Distribution System which have no impact on installation or procurement. The report should address whether these inconsistencies involve violations of S&L's procedures pertaining to design criteria and specifications.
19. Page D.2-1 states that, for cable tray loading, "a S&L design restraint is that cables are below the top level of the side rails. This is shown in Project Instruction P1-BB-17, REv. 3 (EL-10)." The report should provide the results of a sampling of the design product to determine that cable trays are actually not filled above the side rails and that PI-BB-17 is correctly implemented.
20. Page D.3-1 refers to design calculations for instrument tube spans. The IDR acceptance criteria cover documentation, checking and review/approval. The IDR should also address validity of input and assumptions.
21. Page 2 states that construction verification is not included in the IDR. The report indicates that the IDR team did visit the Byron site, although it provides no specific indication of the results of site reviews. Some onsite verification is necessary, e.g., to confirm hardware configurations assumed in design analyses. The report should include specifics of site reviews by the IDR team.
22. For qualification of equipment the IDR addressed seismic aspects, but not environmental aspects. The IDR should address environmental aspects of equipment qualification.
23. The IDR seems to have gaps in the instrumentation and controls coverage, especially with regard to FSAR Chapter 7 topics. (See the "Design Adequacy" appendices). For example, there is no evidence of reviewing for compliance with commitments in FSAR Chapter 7.5, "Safety Related Display Instrumentation." The report should reflect complete coverage in instrumentation and controls.
24. The IDR and report should address compliance with commitments to RG 1.97 relative to instrumentation required during and following an accident.
25. Appendix D-2 addresses electrical separation with respect to RG 1.75, Rev. 2. However, there is no indication in the report that the IDR covered interface review reports and analyses to justify violation of separation criteria.

26. The appendices on Design Adequacy refer to review of P&IDs as verification of design adequacy. Verification of design adequacy should also involve reviewing design end products, such as piping detail drawings and purchase specifications. The report should reflect the results of these reviews.
27. Page A.1-12 indicates that design pressure and temperature are verified based on the S&L piping line list. It is our understanding that the line list is not a design document. Therefore, it would be more appropriate to use piping detail drawings to verify that correct temperatures are reflected in the design.
28. The Mechanical Process evaluations should cover functional reviews to confirm that the systems will fulfill system requirements under normal and accident conditions.

June 1984 Interim Report

1. The review for identifying jet impingement of targets was performed by Bechtel. In cases where instances of jet impingement upon targets were identified, Bechtel asked S&L for an analysis as to any effect upon safe shutdown. Such analyses appear to have been produced only because Bechtel identified the need for them. If this is the case, this indicates a gap in S&L's design process, i.e., there should be analyses for potential jet impingement "hits" and of the consequences of the "hits". The report does not indicate that Bechtel made any attempt to evaluate S&L reviews in this area. The report should address this matter.
2. The IDR should evaluate both circumferential and longitudinal pipe breaks and apply the worst case to jet impingement analyses. The report does not indicate which types of breaks were addressed.
3. Page 4 states that the IDR excluded reviews of pressure/temperature calculations establishing post-break design conditions and design adequacy of structural components because the CCW and ESW systems are not high energy systems. This appears inappropriate because the pipe breaks addressed in the reviews were from high energy systems. The CCW and ESW systems are the targets of pipe breaks and therefore of secondary importance to effects upon post-break design conditions and design adequacy of structural elements (e.g. walls).
4. Pages A.2-4 and B.2-1 indicate that CCW and ESW lines which are larger than the line receiving the break will not have an unacceptable jet impingement "hit". (Standard Review Plan 3.6.2 has a similar rationale for pipe whip, but not for jet impingement.) The report should provide the basis for this determination. The IDR should also consider that while the jet impingement from a break of small diameter pipe may not result in a consequential break of a larger diameter pipe, it will probably result in a functional loss (e.g. by bending) of the larger diameter pipe.

5. Comment 12 above on the May 1984 interim report is still valid, notwithstanding the content of the June 1984 interim report. We note that the June 1984 report covers jet impingement, which was not addressed in the May 1984 report. The report should provide details on how the jet impingement analyses were performed, e.g., by use of jet cones emanating from pipe breaks.

In addition to the above comments on the interim reports, we note that the resumes enclosed with the IDR program plan do not indicate specific experience on analyses for effects of high/moderate energy breaks. The final report should identify the responsible reviewers in this area and their specific plant experience in performing such analyses.