



Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

April 24, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Byron Generating Station Unit 2
Braidwood Generating Station Units 1 and 2
Design Verification Activities
NRC Docket Nos. 50-455, 50-456,
and 50-457

References (a): January 14, 1985 letter from D. G. Eisenhut
to Cordell Reed.

(b): May 11, 1983, letter from Cordell Reed to
H. R. Denton.

Dear Mr. Denton:

This letter provides the information requested in reference (a) regarding recent design verification activities associated with the Byron Unit 2 and Braidwood Units 1 and 2 projects. This information explains how the findings of the Byron Independent Design Inspection (IDI), the Byron Independent Design Review (IDR) and the Clinton IDR have been addressed for Byron 2 and Braidwood 1 and 2.

The enclosure and the seven attachments to this letter contain the supporting details in response to the six requests in reference (a). Much of this information was reviewed with the NRC in Bethesda on April 10, 1985. The slides used in that presentation are also attached.

Prior to the Byron IDI, Commonwealth Edison provided extensive information regarding the procedures and practices used in the control of design and construction of Byron. Reference (b) contains detailed information on various special internal and external reviews as well as documentation of regular design control practices, quality assurance activities and the experience level of engineering personnel. Because Byron and Braidwood are duplicate plants, most of this information is applicable to both plants.

8505070226 850424
PDR ADDOCK 05000455
G PDR

13021
11

H. R. Denton

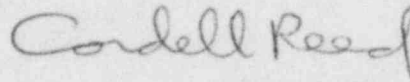
- 2 -

April 24, 1985

The information provided in reference (b), the Byron IDI and IDR and the information provided with this letter form the basis for our conclusion that the design processes for Byron and Braidwood plants have met the applicable NRC regulations and our licensing commitments. We are confident that these plants can be operated safely.

Please direct further inquiries regarding this matter to this office.

Very truly yours,

A handwritten signature in cursive script that reads "Cordell Reed".

Cordell Reed
Vice President

lm

cc: J. Taylor
J. Keppler

Enclosure

0030K

ENCLOSURE

ADDITIONAL INFORMATION REQUESTED ON
JANUARY 14, 1985

1. NRC Request

Summarize the differences in the design process between Byron 1 and each of the other three plants.

Response

The Byron and Braidwood plants are essentially duplicate plants. The design processes utilized for Byron 2 and Braidwood 1 and 2 are the same as those utilized for Byron 1. In addition, the Sargent & Lundy (S&L) design has been performed by the same S&L Byron/Braidwood project team, using the same procedures and under the same project supervision. However, certain piping analysis and support designs are being designed by a different design organization on Braidwood than on Byron.

On Byron 1 and 2, Westinghouse (W) performed the piping analysis and support design for the containment piping and selected subsystems within the auxiliary building. S&L had design responsibility for most of the remaining major safety-related piping subsystems for both units. NPS and the piping contractors had responsibility for selecting pipe supports on some of the small bore lines. The scope of work for each of these organizations is specifically delineated in documented divisions of responsibility.

On Braidwood 1 and 2, S&L is performing the safety-related piping analysis and support design for the two units, including those corresponding process piping subsystems for which W, NPS and the piping contractors had responsibility on Byron 1 and 2. (The responsibility for the reactor coolant piping was retained by W.) It should be noted that S&L was the focus of the Byron 1 Independent Design Review (IDR). Therefore, the S&L design process was subjected to an extensive, detailed review.

An additional aspect of the Braidwood piping analysis approach is that the Byron piping analysis is being duplicated for Braidwood, wherever possible. The Braidwood piping and supports are reconciled with the Byron analysis through a formally documented process. This approach enhances the uniformity of design between Byron and Braidwood, and reinforces the duplicate plant relationship. There are, of course, unique Byron 2 and Braidwood pipe routings that result in unique analysis and support design.

In summary, the design process being utilized for Byron 2 is the same as that for Byron 1, and the S&L design process for Braidwood 1 and 2 is essentially the same as Byron 1.

2. NRC Request

Discuss the effects of these differences on your confidence that the design process for each of the other three plants is at least equivalent to Byron 1.

Response

There are basically no differences in the design process utilized for Byron 2 and Braidwood 1 and 2 versus those utilized for Byron 1, as noted in Response 1. There are no fundamental engineering differences between the S&L and the W piping analytical and support design techniques. Bechtel, as part of the IDR on Byron 1, reviewed S&L's design process in the piping analysis and support design and had no significant findings. Also, the design guidelines utilized by NPS and the piping contractors were developed by S&L. Thus, a uniform design approach is being applied on Byron and Braidwood.

There are some engineering and technological advances that are being utilized on Byron 2 and the Braidwood units that were not available on Byron 1. These advances involve improved design tools to enhance standardization and reflect the state-of-the-art in power plant design. They represent enhancements to the existing design process, and are reflected primarily in greater utilization and integration of computer aided engineering and computer aided design, including pipe support optimization. It is our intent to continue to utilize similar enhancements in the future.

These techniques, in conjunction with the replication approach being utilized for Byron 2 and Braidwood 1 and 2 piping analysis, enhance the uniformity of design and more effectively implement standardization. We are confident that the design process used for Byron 2 and Braidwood 1 and 2 is equivalent to, and reflects the same or better level of design and design control as that of Byron 1.

3. NRC Request

Provide information on how Byron IDI findings have been addressed for each of the other three plants.

Response

The findings from the Byron 1 IDI are being addressed on the other three units. A summary of that review is included as Attachment 1, and additional details are provided in Attachment 3 and 4. Uniform actions have been or are being taken, as appropriate.

In addition, Commonwealth Edison Company's (CECo's) letter of December 30, 1983 from C. Reed to R. C. DeYoung, identified 15 specific findings and unresolved items from the Byron IDI that were to be addressed separately for Braidwood. An additional commitment to specifically address Finding 2-16 on jet impingement for Byron 2 and Braidwood 1 and 2 was subsequently made at a meeting with the NRC on August 14, 1984 and formally committed in CECo's letter of August 16, 1984. The Byron 2 and Braidwood unique responses to these 16 findings and unresolved items are included herewith as Attachment 2.

In the period of January 7-11, 1985, CECo Quality Assurance (QA) performed an audit at S&L and W to verify that corrective actions have been implemented for the commitments made in response to the NRC IDI for Byron 1. The audit team concluded that the commitments made in response to the IDI report have been properly implemented and completed, or are in the process of being implemented. For items which were found to be in the process of being implemented, three observations and ten open items were established. One open item dealt specifically with corrective actions remaining to be done for Braidwood units 1 and 2, and one open item dealt with Byron 2 and Braidwood 1 and 2. The open items will be tracked by CECo QA until satisfactorily completed. CECo QA is assuring that Byron 1 IDI items are being addressed for Byron 2 and the Braidwood units.

4. NRC Request

Provide information on how applicable Byron 1 IDR findings have been addressed on each of the other three plants.

Response

The Bechtel IDR findings were reviewed against all four units. A summary of the review of the findings for Byron 2 and Braidwood 1 and 2 is included as Attachment 5. Uniform actions are being taken, as appropriate, except for site-specific matters as indicated in Attachment 5, which are described in further detail in Attachment 6 and 7.

5. NRC Request

Provide information on how applicable Clinton IDR findings will be addressed for Byron 2 and Braidwood 1 and 2.

Response

The final report on the Clinton IDR was issued in late January 1985. S&L has performed a preliminary overview assessment of the findings of this report relative to their potential impact on Byron 2 and Braidwood 1 and 2. This preliminary assessment indicates that there are no major design impacts and no items from Clinton that resulted in physical plant changes on the Byron 2 and Braidwood units.

In the period January 21-25, 1985, CECQ QA performed an audit to verify that design concerns/problems identified at other nuclear projects were being satisfactorily addressed by S&L for Byron and Braidwood. Foremost in this audit was an evaluation to assess if items identified in the Bechtel IDR of Clinton were being addressed for Byron/Braidwood.

As part of the CECQ audit team, four consultant from Energy Incorporated worked exclusively on evaluating how the Clinton IDR items were being handled for Byron 2 and Braidwood. The objective was to make an assessment to determine if the Clinton IDR problems existed at Byron/Braidwood and, if so, to determine if appropriate action had been taken by S&L to address the problems. Two findings, one observation and three open items were identified. The findings resulted because of: 1) a lack of evidence to demonstrate that corrosion allowances were being considered during the equipment qualification review and 2) the FSAR stated the ACI strain limit for non-containment concrete structures as 0.002 in/in when it should be 0.003 in/in. This latter observation was made because checklists used by S&L for reviewing equipment seismic reports did not show actual versus allowable values. The three open items dealt with the S&L review of vendor fabrication drawings, the need for additional information to demonstrate the adequacy of the seismic qualification of the diesel fuel storage tanks, and the need for S&L to have a system to assure the FSAR continually conforms to design changes. Other than these items, the Clinton IDR items were being satisfactorily handled in the Byron/Braidwood design and the audit team concluded the following:

"The Byron/Braidwood personnel were acutely aware of the types of concerns (or similar ones) expressed in the Clinton IDR, and have made adequate provision to deal with them. That awareness usually was not due to the Clinton IDR but rather was obtained by experience related to interfacing with the NRC (such as IE Bulletins), and project experience such as the IDI and IDR on Byron Unit 1. Based upon the audit samples examined, all the concerns expressed in the Clinton IDR are already being addressed in an acceptable manner by the Byron/Braidwood projects."

6. NRC Request

Provide a description of the aspects of your QA program related to design which assures that the applicable design commitments are implemented at Byron 2, Braidwood 1 and 2.

Response

The CECQ QA Department has been actively performing comprehensive audits of its architect-engineers to verify the acceptability of the design of the Byron and Braidwood units. Much of this auditing has been performed by CECQ QA engineers with broad background in design. On numerous occasions, consultants with extensive technical background in nuclear design have participated as team members on the CECQ audits. Also, these consultants have performed separate independent design analysis audits under the direction of CECQ QA.

The CECo audits of the architect-engineering organizations began in early 1974. From 1974 through 1978 the audits primarily examined programmatic controls and implementation. Beginning in February 1979, the CECo audits were widely expanded to include an in-depth analysis of design activities. Since 1979, 16 design analysis audits have been performed by CECo QA in the S&L corporate offices to verify the design of the Byron/Braidwood units. The scope of the design analysis audits covered such items as:

- A. technical review and evaluation of calculations;
- B. implementation of FSAR commitments;
- C. computer program validation and usage ;
- D. piping design and analysis;
- E. controlling and processing design changes;
- F. stress analysis;
- G. design support activities by other design organizations;
- H. verification of qualification of design and engineering personnel;
- I. incorporation of design criteria and parameters into design documents;
- J. design interface and data control with other design organizations;
- K. technical aspects of electrical, mechanical and structural design including instrumentation and control;
- L. design of supports, hangers, snubbers and restraints including application of loading;
- M. seismic and environmental qualification of equipment
- N. effectiveness of design control and design review including data verification;
- O. overall design review;
- P. Independent Design Review of Byron Unit 1;
- Q. verification that significant problems identified at other nuclear projects under construction are addressed for Byron and Braidwood units.

In addition, CECo QA has been actively involved in assuring that concerns identified in the Byron IDI and Clinton IDR have been fully addressed by the architect-engineers for Byron 2 and the Braidwood units. Specific CECo audits have been performed to cover these areas.

As a supplement, and in addition to the CECQ QA activities, the S&L QA Division has been involved with the Byron 1 IDI and IDR since their inception. S&L QA personnel participated in the review of the responses and are well aware of the commitments and follow-up actions required.

In addition to assisting CECQ in their audits of S&L during the IDI process and subsequently for compliance with the IDI/IDR commitments, the S&L QA Division has also included the IDI findings in their trend review of nonconformances. The trend review evaluation is distributed to Byron/Braidwood departmental and Project Management personnel, as well as QA Division personnel. Pertinent items from the trend review are included in the S&L QA Auditor's checklists for auditing calculations and drawings.

The QA aspects of the design commitments are applied equally to the Byron and Braidwood projects. The S&L QA procedures, project instructions and standards are used as the basis for QA monitoring of both projects in the administrative, coordination, training, auditing, and records areas.

The generic corrective actions of the IDI/IDR have been applied equally to the Byron and Braidwood projects. These actions include the following:

- A. The requirement for documentation of engineering judgment has been incorporated into the revised S&L QA Procedure GQ-3.08, "Design Calculations," and in the engineering standards on calculations for all three engineering disciplines (mechanical, electrical and structural).
- B. The transmittal of information for design input between project team members of different divisions is the subject of a new S&L QA procedure, GQ-3.17, "Design Information Transmittal."
- C. S&L QA procedure GQ-2.05, "Departmental Training," has been revised to apply additional emphasis on indoctrination and training of personnel in S&L administrative and technical standards and/or procedures to assure that suitable proficiency is achieved and maintained. The applicable departmental standards have also been, or will be revised to enhance this training.

This demonstrates that CECQ and S&L have conducted an adequate, self-directed engineering assurance program and have confidence that the design processes for Byron 2, Braidwood 1 and 2 have met NRC regulations and licensing commitments. The approach described herein is on-going and will continue until the remaining three units are licensed.

ATTACHMENT 1

SUMMARY OF
APPLICABILITY OF BYRON 1 IDI FINDINGS

	<u>BYRON 2</u>	<u>BRAIDWOOD 1</u>	<u>BRAIDWOOD 2</u>
Action Completed by Byron 1 Response	66	62	60
Unique Response Required*	16	16	16
Additional Action Required**	7	7	7
Not Applicable***	7	11	13
Total	<u>96</u>	<u>96</u>	<u>96</u>

* See Attachment 2 for the Unique Responses.

** See Attachment 3 for a summary of the additional actions required.

*** See Attachment 4 for a summary of the reasons that these findings were not applicable to Byron 2 or Braidwood 1 and 2.

ATTACHMENT 2

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Finding 2-1: Diesel Engine Air Intake

This finding states that there was no analysis or justification for the seismic vulnerability of the air intake line for the auxiliary feedwater pump diesel. The finding indicates that this conflicts with the Auxiliary Feedwater Design Criteria which states that a single active failure plus a design basis seismic event shall not prevent the auxiliary feedwater system from meeting its functional requirements.

Byron 2 and Braidwood Unique Response to IDI Finding

The response provided for Byron 1 generally applies to Byron 2 and Braidwood 1 and 2 also. Pipe routings and relative equipment locations are essentially the same for all four units. However, the documented walkdown of this area that was referenced in the Byron 1 response was applicable only to Byron 1. Similar walkdowns will be performed on Byron 2 and Braidwood 1 and 2 to assure that there are no additional non-safety-related components in the vicinity that could impair the function of the auxiliary feedwater pump diesel drive air intake line. These walkdowns should all be completed by 12-31-85, and it is anticipated that they will support the same conclusion of design adequacy that was reached on Byron 1.

Commonwealth Edison Company
Byron Station - Unit 2
Braidwood Station - Units 1 & 2

ATTACHMENT 2 (Cont'd)
04-16-85
Page 2 of 16

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Finding F2-16 Jet Impingement Analysis

The Team found that, although FSAR Section 3.6.2.2.2.1.4. indicates, for postulated breaks, how the jet impingement force will be calculated, no jet impingement analysis had been performed. The Team found that, although Sargent & Lundy personnel indicated they had intended to do the work, no documented program or procedure was in place to provide assurance that the work would be completed.

Byron 2 and Braidwood Unique Response to IDI Finding

The final response to the Byron 1 finding on jet impingement was presented to the NRC at the 08-14 meeting, at which time the NRC was presented with Commonwealth Edison Company report entitled "Byron 1 Confirmation of Design Adequacy for Jet Impingement Effects," dated August 1984. This document was formally submitted to the NRC by CECO's letter dated 08-16-84. In this letter, CECO made a commitment that similar reports would be prepared for Byron 2 and Braidwood 1 and 2 prior to fuel loading at each of these units. Therefore, the unique responses for each of the remaining three units will be provided in their own plant specific jet impingement reports.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Finding 3-2: Functionality Criteria

In summary, the memorandum defining systems to be checked for functionality was incomplete. Some of the analysis packages that had been defined as needing the check did not state that the criteria had been met and, for some of the packages that did state the criteria was met, it was not clear that valid analyses had been performed to make this determination. These items indicated systematic weaknesses in the Program for Meeting Functionality Criteria so that the licensing commitment was not being met.

Byron 2 and Braidwood Unique Response to IDI Finding

In general, the statements made in response to the Byron 1 finding are applicable to Byron 2 and Braidwood 1 and 2. However, it should be noted that the Sargent & Lundy system for identifying the subsystems requiring a functional capability check was formalized on 05-10-84, which was prior to the completion of final stress reports on Byron 2 and Braidwood 1 and 2. The Byron 2 and Braidwood piping stress analysis reports generated by Sargent & Lundy, will indicate that a functional capability check has been made and documentation will exist relative to this functional capability check.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron Finding 3-8: Relocation of Support

A field walkdown conducted to examine the pipe supports for the 100% as-built subsystem 1AF14 indicated the existence of two different supports having the identical designation 1AF14009R. Hunter Corporation had originally requested relocation and redesign of the original configuration 1AF14009R via a discrepancy report (Reference 3.220; see also References 3.221 and 3.222). The new support was properly designated and installed, but Hunter Corporation had no document on file that explicitly flagged the removal of the original configuration. The Team did not determine the exact cause of this error, which should be addressed in the resolution of this item. (Finding 3-8)

Byron 2 and Braidwood Unique Response to IDI Finding

The Byron 1 response applies to Byron 2 also, but we believe the Byron 1 finding to be an isolated error. For Braidwood, piping supports are installed and removed by a controlled, proceduralized process. This process requires that if a pipe support is relocated, a contractor review of the design revision for changes to the previous revision is done. This review includes prior installation records if this revision changes the support location. If the previous support had work accomplished on it, then a Temporary Attachment and Removal Order and/or a Field Change Order is initiated for removal. A second process to assure the change has been incorporated is the final subsystem walkdown.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Finding 3-10: Pipe Span Length

This finding indicates that as-built dimensions that Nuclear Power Services obtained from Hunter Corporation were incorporated into the Nuclear Power Services as-built piping isometrics. In one instance, incorporation of piping as-builts caused the span length (Ls) between supports 1SX92012R and 1SX92013R to increase to 10', 7-1/8", which exceeded the maximum span length (9.5') given in Sargent & Lundy's Small Piping and Tubing procedure.

The Sargent & Lundy procedure provided an installation tolerance on support locations of +6", a total of 1', 0" for each span. This finding states that Nuclear Power Services' analysis failed to note this change in its review of the piping Subsystem 1SX92, and also states that it is an isolated case of review error and the discrepancy will not result in support loads of pipe stress that will exceed ASME code allowances.

Byron 2 and Braidwood Unique Response to IDI Finding

As noted in the finding, the variation in the span length was identified as an isolated case and is not applicable to Byron 2 or Braidwood 1 and 2. In addition, Nuclear Power Services does not have design responsibility for this piping at Braidwood. Sargent & Lundy is responsible for designing piping supports for ASME Section III small bore piping at Braidwood Station. At both plants, before the piping contractor installs piping and supports outside of the installation tolerance, the piping contractor is required to submit the condition to the design engineer for disposition. In addition, if the out of tolerance condition is identified by the design organization, the piping contractor is required to generate a NonConformance Report to cover this condition. The mechanism by which these nonconforming conditions are identified to CECO and the piping contractor was reinforced in revisions to S&L Project Instructions PI-BB-27 on Byron and PI-BB-66 on Braidwood.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Finding 3-13: Pipe Movements in Relation to Gap Clearance

The finding addresses the adequacy of the calculation done to check the piping displacements at wall penetrations 1AB16080 and 1AB38 to verify modeling assumptions and concludes that the calculation failed to confirm the modeling assumption.

Byron 2 and Braidwood Unique Response to IDI Finding

Byron 2 and Braidwood penetration sleeve clearances will be reviewed to verify piping analysis modeling assumptions similar to the approach utilized on Byron Unit 1. For Byron Unit 2, this review will be performed by the design organizations having responsibility for the piping subsystem. For Braidwood, Sargent & Lundy will be performing this review for all piping systems.

In both instances, when engineering judgement is utilized to determine that vector addition is not required because the associated global displacements are small, this judgement will be so documented.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Finding 3-14: Branch Line Analysis

The finding addresses the evaluation of the 1/2" branch lines 1CS22BA and 1CS22DA which were not included in the model for Subsystem 1CS09, and concludes that the analysis does not support seismic qualification of the lines.

Byron 2 and Braidwood Unique Response to IDI Finding

The Byron 1 response is directly applicable to Byron 2. The response is also applicable to Braidwood 1 and 2, with the exception that Sargent & Lundy is performing the piping analysis instead of Westinghouse. Typically, instrument lines of the type identified in the finding are included as part of the main piping models. Separate hand calculations are performed in cases when they are not included with a main piping model.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Finding 3-15: Hanger Dimension

There is a discrepancy between the piping isometrics and the support drawings involving the location of two supports (M-1CS09010X and M-1CS09014X).

Byron 2 and Braidwood Unique Response to IDI Finding

Discrepancies between the contractor's piping isometric installation drawings and support designs do occur in the design process due to the dynamic nature of the support design process. However, these are expected and are resolved systematically.

The process that resolves discrepancies between as-built isometrics and design dimensions requires that CECO be notified of differences in the as-built dimension. The process utilized on Byron 2 is the same as that described in the Byron 1 response. The Braidwood as-constructed piping isometric drawings will not contain as-built support dimensions which should further minimize the possibility of discrepancies. The support dimensions are specified on the support drawings, and the installed positions will be checked against the key plan of the support drawing and documented.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron Finding 4-8: Elevation of Conduit Support

This finding concerns the elevation of Conduit Support FC-3. The finding states that conduits were installed about two (2) feet higher than shown on electrical installation drawings.

Byron 2 and Braidwood Unique Response to IDI Finding

Our program requires the contractor to submit a change document to the designer for approval prior to installing any item outside of the construction tolerance. If an out-of-tolerance condition is identified by the contractor or design organization after installation and inspection, the contractor is required to generate a nonconformance report to disposition this condition. These control systems are in place at both sites.

Furthermore, it should be noted that there are other programs of over-inspection which are performed on completed installation which will result in identifying generic construction problems.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron Finding 4-10: Conduit Pipe Strap

This finding concerns an uninstalled conduit strap.

Byron 2 and Braidwood Unique Response to IDI Finding

As pointed out in the Byron 1 response and reiterated in our Byron 2 and Braidwood response to Finding 4-8, there are systems in place within the construction program to identify, document, and correct deficiencies and/or inconsistencies. The general effectiveness of these controls is verified through independent inspections, such as the unit concept inspections. In addition, as was done during the completion of Byron 1, a final walkdown will be conducted to ensure that the conduit installation is properly installed and no items are missing.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron Finding 6-4: Calibration Interval

This finding addresses a discrepancy between the test reports (References 6.28 and 6.29) and the proposed technical specifications regarding the calibration test interval for the auxiliary feedwater pump suction pressure switches (1PSL-AF051 and 1PSL-AF055). The test reports specify a test interval of 208 weeks, while the technical specifications specify a test interval of 18 months.

Byron 2 and Braidwood Unique Response to IDI Finding

Byron 2 and Braidwood Station, as of this date, have not written a calibration test report package covering 1PSL-AF051 and 1PSL-AF055. However, it should be noted that the technical specifications for Byron 1 have now been finalized, and the calibration test reports for all four units are being revised to agree with these specifications.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron Finding 6-6: Test Report

The Commonwealth Edison test report for 1PSL-AF055 incorrectly states the direction of pressure change for the low suction pressure setpoint (Reference 6.29). In addition, this test report has a typographical error in the number for wire AF1BLA5 in that it was listed as AF1BLA3. At the time this test report was inspected, Commonwealth Edison actions to correct the Sargent & Lundy instrument data sheet and Commonwealth Edison test reports had not been initiated using the instrument discrepancy report form. Subsequent Commonwealth Edison actions to correct the test report and the data sheet discussed in Finding 6-5, while technically correct, appear to introduce unnecessary complexity in the designation of vacuum setpoint values. On the basis of our examination of other test reports (References 6.125, 6.126, 6.127, and 6.129), these errors did not appear to represent systematic weaknesses.

Byron 2 and Braidwood Unique Response to IDI Finding

This appears to be an isolated case and Byron 2 and Braidwood Instrument Data Sheets for these instruments are the same as Byron 1. The data sheets have been corrected. Byron and Braidwood have procedures for systematically correcting deficiencies which are identified.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Unresolved Item 2-3: Pipe Tip Deflections

Sargent & Lundy Project Instruction PI-BB-38 states that subsequent to pipe whip restraint design the final pipe tip deflections are transmitted to Project Management Division for review. This had not been done prior to the inspection and criteria for this review are not stated.

Byron 2 and Braidwood Unique Response to IDI Unresolved Item

Sargent & Lundy Project Instruction PI-BB-38 is also applicable to Byron 2 and Braidwood. The disposition of final pipe whip tip deflections was completed on Byron 1 using calculated deflections and a walkdown survey of the as-built configuration of the plant. This process is also being implemented on Byron 2 and Braidwood. PI-BB-38 is being revised to include responsibility and criteria for this disposition. The Project Instruction revision is scheduled for 06-03-85.

It should also be noted that approximately 60 pipe whip restraints are being eliminated from each unit of Byron 2 and Braidwood 1 and 2 as a result of the NRC's recent approval of the elimination of arbitrary intermediate pipe breaks (see 01-07-85 letter to CECO from the NRC).

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Unresolved Item 3-5: Functional Capability Criteria

Unresolved Item 3-5 addresses the difference in functional capability criteria for NSSS and BOP piping, stating that Westinghouse is using criteria approved for NSSS piping for analysis of BOP piping.

Byron 2 and Braidwood Unique Response to IDI Unresolved Item

FSAR Subsection 3.9.3.1.2.2 has been revised (Amendment 46, dated January 1985) to clarify the use of this criteria for Westinghouse scope of piping.

In addition, this same functional capability criteria is being utilized on Braidwood for the piping that is now under Sargent & Lundy's design responsibility. This clarification will also be submitted as a change to the FSAR.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron IDI Unresolved Item 5-1: Analysis Concerning Lack of Separation

This item concerns specific open questions described in Notes 1, 2 and 3, and in Samples A, D and E of the report. Note 1 concerns cable tray separation. Note 2 indicates that a cable touching the sidewall of a cable tray is a violation of Hatfield Procedure #10. Note 3 concerns touching of safety-related and non-safety-related conduits. Sample A concerns support of a tubing bundle in the remote shutdown panel. Sample D concerns safety-related and non-safety-related cables in close proximity in Panel 1PA11J. Sample E concerns safety-related and non-safety-related cables in close proximity in Switchgear Bus 141 Cubicle 16.

Byron 2 and Braidwood Unique Response to IDI Unresolved Item

Although these were Byron 1 specific findings, the following response addresses this item at Byron 2 and Braidwood. The Byron 2 response is identical to the Byron 1 response. The Braidwood response is identical except that the contractor is different and the Braidwood procedure references are different.

With respect to conduit separation, and as was done on Byron 1, a walkdown will be conducted on Byron 2 and Braidwood 1 and 2 to identify and assess conduit separations less than 1".

Corrective actions as identified in the Byron 1 response for Samples A, D and E will be implemented on Byron 2 and Braidwood 1 and 2.

BYRON 2 AND BRAIDWOOD UNIQUE
RESPONSES TO BYRON 1 IDI ISSUES

Byron Unresolved Item 6-1: Loss of Offsite Power Test

Commonwealth Edison Byron Station personnel stated that a complete test of each automatic initiation signal was scheduled during the engineered safety features preoperational test. A number of preoperational test procedures (References 6.99, 6.100, and 6.101) and the loss of off-site power startup test procedure (Reference 6.102) were inspected at the Byron Station to determine how the engineered safety feature actuation system interface would be tested. The loss of off-site power test will automatically initiate auxiliary feedwater and numerous other engineered safety feature systems when circuit breakers are opened to simulate a loss of off-site power; however, Step 9.1.20 of this procedure only requires verification "that at least one train of the above (listed) equipment is running." This may have been an inadvertent omission from the test procedure acceptance criteria as the procedure was not yet signed. Since both trains are required to start automatically under these conditions, the licensee should ensure that the test procedure requires verification that both trains start during the test.

Byron 2 and Braidwood Unique Response to Unresolved Item

The Byron 1 Station procedure (Reference 6.102) was revised prior to the final approval of the procedure to address the concern delineated in the unresolved item. Appendix C3 in the Data Reduction section addresses the verification of the start of both trains of the auxiliary feedwater pumps and the verification that at least one train runs throughout the test. The Byron 2 and Braidwood 1 and 2 procedures will reflect these changes.

ATTACHMENT 3

SUMMARY OF
THE ADDITIONAL ACTION REQUIRED BY BYRON 1 IDI FINDINGS

FINDING OR UNRESOLVED ITEM	ADDITIONAL ACTION REQUIRED			DESCRIPTION OF ACTION
	BY 2	BR 1	BR 2	
F2-12		x	x	Braidwood Overall Design Review
F2-14	x	x	x	Confirmatory Pipe Break Calculations
F2-18	x	x	x	Confirmatory Flooding Calculations
F3-1	x	x	x	Revise Response Spectra File
F3-9	x*	x*	x*	Nozzle Load Calculation
F3-16	x*			<u>W</u> U-Bolt Confirmatory Calculation
F3-17	x*			<u>W</u> Support Relocation Confirmatory Calculation
F6-1	x	x	x	AF System Valve Operability During Preoperational Test
U3-2		x	x	Evaluate Previously Issued Pipe Supports for Lateral Vibration
Total	7	7	7	

x - Indicates Additional Action Required.

* - Indicates Follow-Up Action has been completed.

ATTACHMENT 4

SUMMARY OF
 BYRON 1 IDI FINDINGS
NOT APPLICABLE TO BYRON 2 OR BRAIDWOOD 1 & 2

FINDING OR UNRESOLVED ITEM	NOT APPLICABLE TO:			REASON FOR NON-APPLICABILITY
	BY 2	BR 1	BR 2	
F3-4	x		x	Unit 1 Drawing Discrepancy Only
F3-5	x	x	x	Isolated Case of Incorrect Flange Weight in Piping Analysis.
F3-7	x	x	x	Isolated Case of Discrepancy in CEA Edge Distance.
F3-12		x	x	<u>W</u> Document Control Item
F3-16		x	x	<u>W</u> U-Bolt Calculation Discrepancy
F3-17		x	x	<u>W</u> Support Relocation Calculation
F4-6	x	x	x	Isolated Case of Pipe Support Calculation Discrepancy.
F4-7	x	x	x	Isolated Case of Pipe Support Calculation Discrepancy.
F4-9		x	x	Isolated Case Confined to Byron Drawings Only.
F5-1		x	x	No Diesel Driven SX Make-Up Pump on Braidwood.
F5-5	x	x	x	Isolated Case of Drawing Transcription Error.
F6-5	x		x	Unit 1 Drawing Discrepancy Only.
U3-6		x	x	<u>W</u> to Verify Correct Equipment Allowable Loads.
Total	7	11	13	

x - Indicates Not Applicable.

ATTACHMENT 5

SUMMARY OF
APPLICABILITY OF BYRON 1 IDR ISSUES

	<u>BYRON 2</u>	<u>BRAIDWOOD 1</u>	<u>BRAIDWOOD 2</u>
Action Completed by Byron 1 Response	29	21	21
Additional Action Required*	4	6	6
Not Applicable**	2	8	8
Total	<u>35</u>	<u>35</u>	<u>35</u>

* See Attachment 6 for a summary of the additional actions required.

** See Attachment 7 for a summary of the reasons that these issues were not applicable to Byron 2 or Braidwood 1 and 2.

ATTACHMENT 6

SUMMARY OF
ADDITIONAL ACTION REQUIRED BY BYRON 1 IDR

<u>ISSUE</u>	<u>ADDITIONAL ACTION REQUIRED</u>			<u>DESCRIPTION OF ACTION</u>
	<u>BY 2</u>	<u>BR 1</u>	<u>BR 2</u>	
8.17		x*	x*	Revise Braidwood Pipe Support Weld Size Tolerance.
8.19	x			Review NPS Pipe Support Calculations.
8.21		x*	x*	Revise Braidwood Criteria Document for Pipe Support Material Interchangeability.
8.25	x	x	x	Support Configuration Reflected in Final Piping Stress Report.
8.29	x*	x*	x*	Equipment Nozzle Load Calculation
8.44	x*	x*	x*	Evaluate Effects on Pipe Analysis of Added Support at Center of CCW Heat Exchangers.
8.49		x	x	Confirm Adequacy of Flanges in Braidwood ESW System
Total	4	6	6	

x - Indicates Additional Action Required.
* - Indicates Additional Action has been Completed.

ATTACHMENT 7

SUMMARY OF
BYRON 1 IDR ISSUES
NOT APPLICABLE TO BYRON 2 OR BRAIDWOOD 1 & 2

<u>ISSUE</u>	<u>NOT APPLICABLE TO:</u>			<u>REASON FOR NON-APPLICABILITY</u>
	<u>BY 2</u>	<u>BR 1</u>	<u>BR 2</u>	
8.2		x	x	Braidwood has no River Screen House.
8.3		x	x	Braidwood has no Diesel Driven SX Make-up Pumps.
8.5		x	x	Braidwood has no River Screen House.
8.16	x	x	x	Code Case N-413 on Minimum Weld Size has been Approved.
8.19		x	x	NPS is not a Piping Design Subcontractor on Braidwood.
8.31	x	x	x	Isolated Calculation Discrepancy on Weld Size.
8.40		x	x	No Manholes with Safety-Related Cables on Braidwood.
8.42		x	x	No Manholes with Safety-Related Cables on Braidwood.
Total	<u>2</u>	<u>8</u>	<u>8</u>	

x - Indicates Not Applicable.

04-10-85

AGENDA
PRESENTATION ON DESIGN VERIFICATION ACTIVITIES
FOR BYRON 2 AND BRAIDWOOD 1 & 2

- | | | |
|------|--|---------------|
| I. | COMMON ELEMENTS OF BYRON/BRAIDWOOD | B. R. SHELTON |
| II. | DESIGN PROCESS SUMMARY | G. C. JONES |
| III. | BYRON 1 IDI ASSESSMENT ON BYRON 2
AND BRAIDWOOD 1 & 2 | G. C. JONES |
| IV. | BYRON 1 IDR ASSESSMENT ON BYRON 2
AND BRAIDWOOD 1 & 2 | G. C. JONES |
| V. | PRELIMINARY CLINTON IDR ASSESSMENT ON
BYRON 2 AND BRAIDWOOD 1 & 2 | G. C. JONES |
| VI. | DESCRIPTION OF QA PROGRAM ASPECTS
RELATIVE TO DESIGN VERIFICATION | G. F. MARCUS |
| | A. GENERAL DESIGN ANALYSIS AUDITS | |
| | B. IDI FOLLOW-UP | |
| | C. IDR FOLLOW-UP | |
| VII. | CONCLUSION | B. R. SHELTON |

PRESENTATION ON
DESIGN VERIFICATION ACTIVITIES FOR
BYRON 2 AND BRAIDWOOD 1 & 2

PURPOSE

- o SUMMARIZE THE RESPONSE TO THE 01-14-85 NRC LETTER FROM D. EISENHUT TO C. REED.
- o ESTABLISH THAT NO FURTHER INDEPENDENT DESIGN REVIEWS ARE REQUIRED ON BYRON 2 OR BRAIDWOOD 1 AND 2.

GOALS

- o EXPLAIN THE EXTENT OF DUPLICATION BETWEEN BYRON AND BRAIDWOOD.
- o DEMONSTRATE THAT BYRON 1 IDI AND IDR FINDINGS HAVE BEEN ADEQUATELY ADDRESSED FOR ALL FOUR UNITS.
- o DEMONSTRATE THAT THE CLINTON IDR FINDINGS ARE BEING APPROPRIATELY ADDRESSED FOR BYRON AND BRAIDWOOD.
- o DEMONSTRATE THAT WE HAVE A QA REVIEW TO FOLLOW ALL ITEMS TO A PROPER CONCLUSION.

COMMON ELEMENTS OF BYRON/BRAIDWOOD

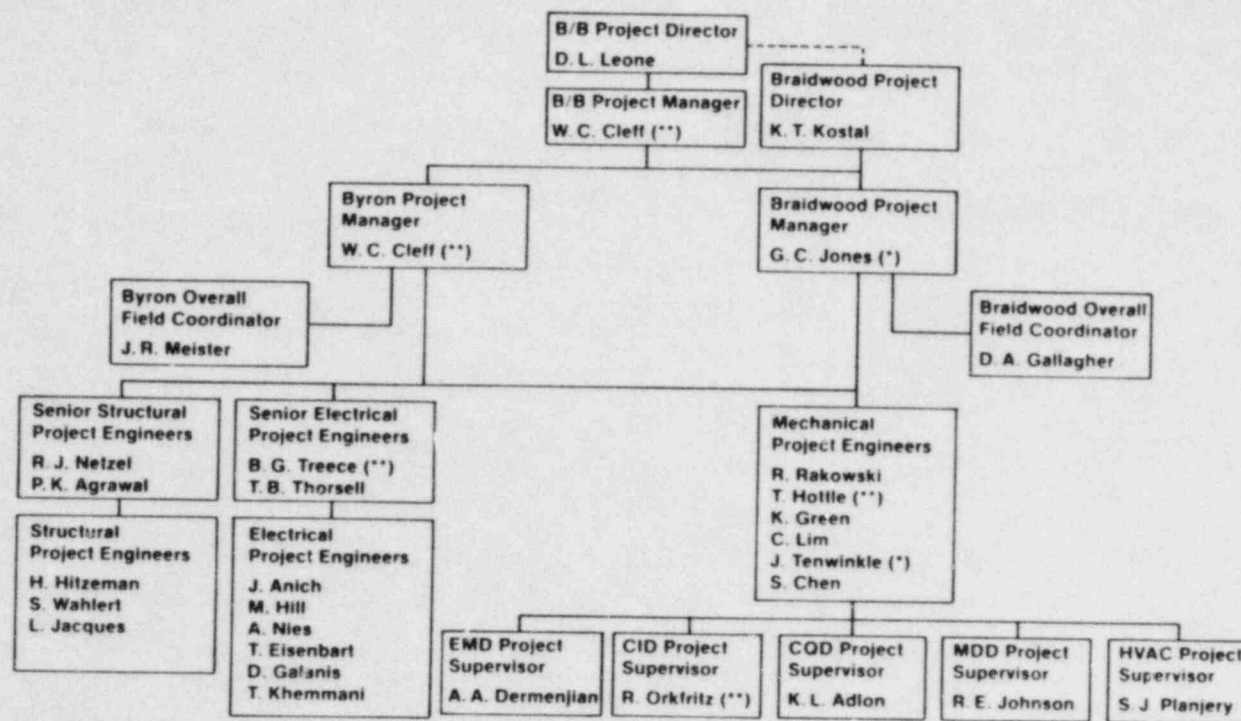
- LICENSING BASIS IS DUPLICATION
 - STANDARD PLANT CONCEPT
 - COMMON PSAR
 - COMBINED COMMON CP HEARINGS
 - SIMULTANEOUS CP ISSUE
 - COMMON FSAR
- DUPLICATE PLANT ARRANGEMENTS
- COMMON DESIGN CRITERIA
- COMMON DRAWINGS FOR THE MAJOR DESIGN RELEASES
(UNIQUE DRAWINGS CREATED TO REFLECT PLANT SPECIFIC FEATURES)
- COMMON EQUIPMENT SPECIFICATIONS
- COMMON VENDORS FOR ALMOST ALL THE EQUIPMENT
- COMMON CECO MANAGEMENT ORGANIZATION FOR ENGINEERING,
CONSTRUCTION, AND QUALITY ASSURANCE
- COMMON A/E

DIFFERENCES IN
BYRON AND BRAIDWOOD

ESSENTIALLY SITE DEPENDENT DIFFERENCES

- OFFSITE POWER SYSTEMS
- COOLING WATER HEAT REJECTION (NATURAL DRAFT COOLING TOWER VERSUS COOLING POND)
- ULTIMATE HEAT SINK (MECHANICAL DRAFT COOLING TOWER VERSUS AUXILIARY COOLING POND, INTEGRAL WITH THE MAIN COOLING POND)
- AUXILIARY SYSTEMS ASSOCIATED WITH THE PRECEDING SYSTEMS
- SECURITY SYSTEM LAYOUT (SITE DEPENDENT)
- DIFFERENT FIELD LABOR CONTRACTORS

Sargent & Lundy Byron/Braidwood (B/B) Project Design Organization



(*) Indicates personnel who do not have previous
Byron experience

(**) Indicates Zion experience

SARGENT & LUNDY

04-10-85
EXHIBIT 11.1

DIFFERENCES IN THE DESIGN PROCESS FROM BYRON 1

	<u>BYRON 2</u>	<u>BRAIDWOOD 1 & 2</u>
CIVIL/STRUCTURAL	SAME	SAME
ELECTRICAL	SAME	SAME
MECHANICAL PROCESS DESIGN	SAME	SAME
PIPING ANALYSIS AND SUPPORT DESIGN*	SAME	DIFFERENT DESIGN ORGANIZATIONS

- *BYRON 1 & 2 - A) W RESPONSIBLE FOR ALL COMPUTER ANALYZED PIPING IN THE CONTAINMENT AND ECCS PIPING IN THE AUXILIARY BUILDING.
- B) S&L RESPONSIBLE FOR REMAINDER OF COMPUTER ANALYZED PIPING (AUXILIARY BUILDING AND OUTDOOR).
- C) NPS AND PIPING CONTRACTOR RESPONSIBLE FOR SMALL BORE PIPE AND INSTRUMENT LINES USING S&L GUIDELINES.
- BRWD. 1 & 2 - A) S&L RESPONSIBLE FOR ALL COMPUTER ANALYZED PIPING (EXCEPT RC PIPING, WHICH IS DONE BY W).
- B) S&L RESPONSIBLE FOR ALL SMALL BORE PROCESS PIPING.
- C) PIPING CONTRACTOR RESPONSIBLE FOR INSTRUMENT LINES USING S&L GUIDELINES.

DUPLICATION OF THE
BYRON PIPING AND SUPPORT DESIGN ON BRAIDWOOD

- GENERAL APPROACH: UTILIZE AN EXISTING PIPING ANALYSIS AND SUPPORT DESIGN FROM BYRON ON BRAIDWOOD, IF POSSIBLE.
- RESULTS THUS FAR INDICATE THAT THIS APPROACH HAS BEEN SUCCESSFUL ON APPROXIMATELY 80% OF THE SUBSYSTEMS. THIS INCLUDES MANY OF THE BYRON SUBSYSTEMS ANALYZED BY W.

ENHANCED DESIGN TOOLS AT
BYRON 2 AND BRAIDWOOD 1 & 2

- PRIMARILY REFLECT GREATER UTILIZATION AND INTEGRATION OF COMPUTER AIDED ENGINEERING AND COMPUTER AIDED DESIGN.

EXAMPLES:

- SMLBOR (COMPUTER AIDED APPLICATION OF GUIDELINES FOR SMALL BORE SUPPORT DESIGN)
 - PIPOPT (OPTIMIZATION OF SUPPORT LOCATIONS, RESULTING IN REDUCING THE NUMBER OF PIPE SUPPORTS)
-
- S&L WILL CONTINUE TO UTILIZE SIMILAR ENHANCEMENTS IN THE FUTURE ON UNIQUELY DESIGNED SYSTEMS.

S&L DESIGN PROCESS ENHANCEMENTS
SUBSEQUENT TO THE BYRON 1 IDI AND IDR

- o S&L HAS INSTITUTED AN ADDITIONAL LEVEL OF REVIEW IN THE FORM OF A CALCULATION SAMPLING PROGRAM (TECHNICAL MONITORING PROGRAM)
- o REQUIREMENTS FOR ADEQUATE DOCUMENTATION OF ENGINEERING JUDGEMENT HAVE BEEN INCORPORATED INTO THE REVISED S&L QA PROCEDURE ON DESIGN CALCULATIONS.
- o DESIGN INPUT BETWEEN PROJECT TEAM MEMBERS OF DIFFERENT DIVISIONS ARE NOW MORE RIGIDLY CONTROLLED THROUGH A NEW S&L QA PROCEDURE.
- o REVISED S&L QA PROCEDURE HAS PLACED ADDITIONAL EMPHASIS ON INDOCTRINATION AND TRAINING OF PERSONNEL TO ASSURE THAT A SUITABLE PROFICIENCY IS ACHIEVED AND MAINTAINED.

SUMMARY OF
APPLICABILITY OF BYRON 1 IDI FINDINGS

	<u>BYRON 2</u>	<u>BRAIDWOOD 1</u>	<u>BRAIDWOOD 2</u>
ACTION COMPLETED BY BYRON 1 RESPONSE	66	62	60
UNIQUE RESPONSE REQUIRED	16	16	16
ADDITIONAL ACTION REQUIRED	7	7	7
NOT APPLICABLE	7	11	13
TOTAL	<u>96</u>	<u>96</u>	<u>96</u>

SUMMARY OF
BYRON 2 AND BRAIDWOOD 1 & 2
UNIQUE RESPONSES TO BYRON 1 IDI FINDINGS

- CECo COMMITTED TO RESPOND TO 15 FINDINGS IN THEIR 12-30-83 LETTER FROM C. REED TO R. C. DEYOUNG.
- PLANT UNIQUE JET IMPINGEMENT REPORTS WERE COMMITTED TO BY CECo IN THEIR 08-16-84 LETTER.
- COMMON APPROACH IS BEING TAKEN AT ALL 4 UNITS.
- SOME OF THIS WORK IS STILL ONGOING.

STATUS OF
BYRON 2 AND BRAIDWOOD 1 & 2
UNIQUE RESPONSES TO BYRON 1 IDI FINDINGS

FINDING OR UNRESOLVED ITEM	COMPLETION STATUS			DESCRIPTION OF FINDING OR UNRESOLVED ITEM
	BY 2	BR 1	BR 2	
F2-1				WALKDOWN OF AF D/G AIR INTAKE
F2-16				PLANT SPECIFIC JET IMPINGEMENT REPORT
F3-2				PIPING ANALYSIS FUNCTIONALITY CHECK
F3-8	*	*	*	CONTROL OF REMOVAL OF VOIDED PIPE SUPPORTS
F3-10	*	*	*	CONTROL OF PIPE SPAN LENGTH DEVI- ATIONS
F3-13	*	*	*	METHOD TO ASSURE PIPE TO SLEEVE CLEARANCES ARE MET
F3-14	*	*	*	ANALYTICAL MODELLING OF PIPE BRANCH LINES
F3-15		*	*	PIPE SUPPORT LOCATION DRAWING DISCREPANCIES
F4-8	*	*	*	CONTROL OF CONDUIT SUPPORT INSTAL- LATION
F4-10				FINAL WALKDOWN OF CONDUIT INSTAL- LATION
F6-4				REVISE CALIBRATION TEST REPORTS
F6-6	*	*	*	INSTRUMENT DISCREPANCY REPORT FORMS
U2-3				FINAL PIPE TIP DEFLECTIONS
U3-5	*			FSAR STATEMENT ON FUNCTIONAL CAPA- BILITY
U5-1				CONDUIT SEPARATION WALKDOWN
U6-1	*	*	*	LOSS OF OFFSITE POWER TEST PRO- CEDURE REVISION

* INDICATES FOLLOW-UP ACTION HAS BEEN
COMPLETED.

SUMMARY OF
THE ADDITIONAL ACTION REQUIRED BY BYRON 1 IDI FINDINGS

<u>FINDING OR UNRESOLVED ITEM</u>	<u>ADDITIONAL ACTION REQUIRED</u>			<u>DESCRIPTION OF ACTION</u>
	<u>BY 2</u>	<u>BR 1</u>	<u>BR 2</u>	
F2-12		X	X	BRAIDWOOD OVERALL DESIGN REVIEW
F2-14	X	X	X	CONFIRMATORY PIPE BREAK CALCULATIONS
F2-18	X	X	X	CONFIRMATORY FLOODING CALCULATIONS
F3-1	X	X	X	REVISE RESPONSE SPECTRA FILE.
F3-9	X*	X*	X*	NOZZLE LOAD CALCULATION
F3-16	X*			<u>W</u> U-BOLT CONFIRMATORY CALCULATION
F3-17	X*			<u>W</u> SUPPORT RELOCATION CONFIRMATORY CALCULATION
F6-1	X	X	X	AF SYSTEM VALVE OPERABILITY DURING PREOPERATIONAL TEST.
U3-2		X	X	EVALUATE PREVIOUSLY ISSUED PIPE SUPPORTS FOR LATERAL VIBRATION.
TOTAL	7	7	7	

X - INDICATES ADDITIONAL ACTION REQUIRED.

*INDICATES FOLLOW-UP ACTION HAS BEEN COMPLETED.

SUMMARY OF BYRON 1 IDI FINDINGS
NOT APPLICABLE TO BYRON 2 OR BRAIDWOOD 1 & 2

FINDING OR UNRESOLVED ITEM	NOT APPLICABLE TO:			REASON FOR NON-APPLICABILITY
	BY 2	BR 1	BR 2	
F3-4	X		X	UNIT 1 DRAWING DISCREPANCY ONLY.
F3-5	X	X	X	ISOLATED CASE OF INCORRECT FLANGE WEIGHT IN PIPING ANALYSIS.
F3-7	X	X	X	ISOLATED CASE OF DISCREPANCY IN CEA EDGE DISTANCE.
F3-12		X	X	<u>W</u> DOCUMENT CONTROL ITEM.
F3-16		X	X	<u>W</u> U-BOLT CALCULATION DISCREPANCY.
F3-17		X	X	<u>W</u> SUPPORT RELOCATION CALCULATION.
F4-6	X	X	X	ISOLATED CASE OF PIPE SUPPORT CALCULATION DISCREPANCY.
F4-7	X	X	X	ISOLATED CASE OF PIPE SUPPORT CALCULATION DISCREPANCY.
F4-9		X	X	ISOLATED CASE CONFINED TO BYRON DRAWINGS ONLY.
F5-1		X	X	NO DIESEL DRIVEN SX MAKE-UP PUMP ON BRAIDWOOD.
F5-5	X	X	X	ISOLATED CASE OF DRAWING TRANSCRIPTION ERROR.
F6-5	X		X	UNIT 1 DRAWING DISCREPANCY ONLY.
U3-6		X	X	<u>W</u> TO VERIFY CORRECT EQUIPMENT ALLOWABLE LOADS.
TOTAL	7	11	13	

X - INDICATES NOT APPLICABLE.

SUMMARY OF
APPLICABILITY OF BYRON 1 IDR ISSUES

	<u>BYRON 2</u>	<u>BRAIDWOOD 1</u>	<u>BRAIDWOOD 2</u>
ACTION COMPLETED BY BYRON 1 RESPONSE	29	21	21
ADDITIONAL ACTION REQUIRED	4	6	6
NOT APPLICABLE	<u>2</u>	<u>8</u>	<u>8</u>
TOTAL	35	35	35

SUMMARY OF ADDITIONAL ACTION
REQUIRED BY BYRON 1 IDR

<u>ISSUE</u>	<u>ADDITIONAL ACTION REQUIRED</u>			<u>DESCRIPTION OF ACTION</u>
	<u>BY 2</u>	<u>BR 1</u>	<u>BR 2</u>	
8.17		X*	X*	REVISE BRAIDWOOD PIPE SUPPORT WELD SIZE TOLERANCE.
8.19	X			REVIEW NPS PIPE SUPPORT CALCULATIONS.
8.21		X*	X*	REVISE BRAIDWOOD CRITERIA DOCUMENT FOR PIPE SUPPORT MATERIAL INTERCHANGEABILITY.
8.25	X	X	X	SUPPORT CONFIGURATION REFLECTED IN FINAL PIPING STRESS REPORT.
8.29	X*	X*	X*	EQUIPMENT NOZZLE LOAD CALCULATION.
8.44	X*	X*	X*	EVALUATE EFFECTS ON PIPE ANALYSIS OF ADDED SUPPORT AT CENTER OF CCW HEAT EXCHANGERS.
8.49		X	X	CONFIRM ADEQUACY OF FLANGES IN BRAIDWOOD ESW SYSTEM.
TOTAL	<u>4</u>	<u>6</u>	<u>6</u>	

X - INDICATES ADDITIONAL ACTION REQUIRED.

*INDICATES ADDITIONAL ACTION HAS BEEN COMPLETED.

SUMMARY OF BYRON 1 IDR ISSUES
NOT APPLICABLE TO BYRON 2 OR BRAIDWOOD 1 & 2

<u>ISSUE</u>	<u>NOT APPLICABLE TO:</u>			<u>REASON FOR NON-APPLICABILITY</u>
	<u>BY 2</u>	<u>BR 1</u>	<u>BR 2</u>	
8.2		X	X	BRAIDWOOD HAS NO RIVER SCREEN HOUSE.
8.3		X	X	BRAIDWOOD HAS NO DIESEL DRIVEN SX MAKEUP PUMPS.
8.5		X	X	BRAIDWOOD HAS NO RIVER SCREEN HOUSE.
8.16	X	X	X	CODE CASE N-413 ON MINIMUM WELD SIZE HAS BEEN APPROVED.
8.19		X	X	NPS IS NOT A PIPING DESIGN SUB-CONTRACTOR.
8.31	X	X	X	ISOLATED CALCULATION DISCREPANCY ON WELD SIZE.
8.40		X	X	NO MANHOLES WITH SAFETY-RELATED CABLES ON BRAIDWOOD.
8.42		X	X	NO MANHOLES WITH SAFETY-RELATED CABLES ON BRAIDWOOD.
TOTAL	<u>2</u>	<u>8</u>	<u>8</u>	

X - INDICATES NOT APPLICABLE.

PRELIMINARY ASSESSMENT OF
CLINTON IDR ON BYRON 2 AND BRAIDWOOD 1 & 2

- FINAL REPORT ON CLINTON IDR ISSUED LATE JANUARY 1985
- CLOSE OUT MEETING WITH NRC HELD ON 03-07-85
- PRELIMINARY ASSESSMENT BY S&L INDICATES THAT THERE ARE:
 - o NO MAJOR DESIGN IMPACT
 - o NO HARDWARE CHANGES
- CEC QA AUDIT OF S&L ON JANUARY 21-25, 1985 INDICATED THAT ALL CONCERNS EXPRESSED IN THE CLINTON IDR ARE ALREADY BEING ADDRESSED IN AN ACCEPTABLE MANNER BY THE BYRON/BRAIDWOOD PROJECTS.

COMMONWEALTH EDISON
QUALITY ASSURANCE DEPARTMENT
SELF DIRECTED ENGINEERING ANALYSIS PROGRAM

- I. GENERAL DESIGN ANALYSIS AUDITS
 - A. BY CEC_o QA
 - B. BY OUTSIDE CONSULTANTS

- II. BYRON 1 IDI ITEMS
CEC_o QA AUDIT - JAN. 7 - 11, 1985

- III. CLINTON IDR ITEMS
CEC_o QA AUDIT - JAN. 21 - 25, 1985

COMMONWEALTH EDISON
QUALITY ASSURANCE DEPARTMENT
DESIGN ANALYSIS AUDITS

- o 1974 - 1978: PROGRAM AUDITS
- o 1979 - PRESENT: DESIGN AUDITS
 - AUDITORS - QUALIFIED ENGINEERS
 - AUDIT TEAMS - 4 OR 5 PEOPLE
 - AUDIT DURATION - 1 WEEK
 - AUDITS COMPLETED - 16
 - AUDIT SCOPE - TECHNICAL

CECo Q.A.
SCOPE OF DESIGN ANALYSIS AUDITS

1. REVIEW CALCULATIONS
2. FSAR COMMITMENTS
3. COMPUTER PROGRAM VALIDATION
4. PIPING DESIGN
5. DESIGN CHANGES
6. STRESS ANALYSIS
7. DESIGN CRITERIA APPLICATION
8. PIPE SUPPORTS, HANGERS, RESTRAINTS, SNUBBERS
9. EQUIPMENT QUALIFICATION
10. CABLE TRAY LOADING
11. BYRON IDI
 - A) NOV. 1983 AUDIT
 - NRC REPORT - FACTS ADDRESSED
 - ADEQUATE SUPPORTING DOCUMENTS
 - RESPONSE - REASONABLE
 - RESPONSE - TECHNICALLY ACCEPTABLE
 - B) JAN. 1985 AUDIT (7 MAN TEAM)
 - VERIFY IMPLEMENTATION OF CORRECTIVE ACTION
 - THREE OBSERVATIONS AND TEN OPEN ITEMS
 - ESSENTIALLY COMPLETE

CECo QUALITY ASSURANCE
BYRON IDI FOLLOW-UP AUDIT - 01-07-85

OBSERVATIONS

1. COMPARE LOGIC DIAGRAMS TO SCHEMATICS
2. CALCULATION FOR BATTERY ROOM TEMPERATURE
3. CALCULATION FOR SLAB LOADING

OPEN ITEMS (MOSTLY DOCUMENTATION)

1. DOCUMENT - EFFECT OF TURBINE BLDG. CRANE FAILURE
2. PREPARE CALCULATION - POSTULATED LONGITUDINAL BREAK
3. REV. FSAR - PRESSURIZER SPRAYLINE
4. REV. REPORT - BATTERY CHARGER EQ NOT DONE
5. REV. CALCULATION - EXCLUDE RHR-1 FROM TIP DEFLECTION
6. REV. FSAR - CLARIFY FUNCTIONAL CAPABILITY CRITERIA
7. REV./REVIEW PROC. - LOSS OF OFF-SITE POWER TEST
8. COMPLETE EQ TEST - PRESSURE SWITCHES
9. REV. PROC. - BRAIDWOOD FINAL LOAD CHECKS
10. PREPARE ANALYSIS - BYRON 2, BRAIDWOOD 1 & 2
JET IMPINGEMENT, MELB,
FLOODING ANALYSIS, FLOOD LEVEL

CECo QUALITY ASSURANCE
BYRON IDI FOLLOW-UP AUDIT - 01-07-85

ASSESSMENT FROM AUDIT REPORT . . .

"THE GENERAL CONSENSUS OF THE AUDIT TEAM IS THAT S&L HAS ADDRESSED THE CONCERNS IDENTIFIED IN THE NRC IDI AND THAT THE COMMITMENTS MADE IN THE RESPONSE TO THESE CONCERNS HAVE BEEN PROPERLY IMPLEMENTED."

"IN SUMMARY, FEW DEFICIENCIES WERE IDENTIFIED. S&L WAS ABLE TO PRESENT ADEQUATE DOCUMENTATION TO SUPPORT THEIR COMMITMENTS. IN SOME AREAS COMPREHENSIVE REVIEWS HAVE BEEN PERFORMED TO SUPPORT S&L'S POSITION."

"UPON VERIFICATION OF COMPLETION OF THE AUDIT ITEMS, THE BYRON IDI ITEMS WILL BE CONSIDERED COMPLETED."

DESIGN ANALYSIS AUDITS - BYRON/BRAIDWOOD
BY OUTSIDE CONSULTANTS

<u>DATE</u>	<u>SCOPE</u>
JUNE 1982	DESIGN CRITERIA
	STRESS ANALYSIS
	EQUIPMENT QUALIFICATION
	EQUIPMENT SPECIFICATION
NOV. 1982	COMPUTER PROGRAM VALIDATION
MARCH 1983	DESIGN MODELS
	ADHERENCE TO CODES
	PIPE WHIP MODELING
	FLUID SYSTEM CLASSIFICATION
	OPERATING MODES
	THERMAL-HYDRAULIC OPER. ANALYSIS
MARCH 1984	SEISMIC/ENVIRONMENTAL QUALIFICATION
	ELECTRICAL SEPARATION
	BYRON IDI ITEMS
JAN. 1985	CLINTON IDR ITEMS
	- VERIFIED FOR BYRON 2 AND BRAIDWOOD 1 & 2
	- OPEN ITEMS

CECo QUALITY ASSURANCE
CLINTON IDR APPLIED TO BYRON/BRAIDWOOD
01-21-85

FINDINGS

- o REVISE FSAR - CORRECT CONCRETE STRAIN LIMIT
- o ANALYZE NEED FOR CORROSION ALLOWANCE IN EQ FOR EQUIPMENT

OBSERVATION

- o CHECKLIST FOR SEISMIC REVIEW DOES NOT DOCUMENT DATA (ACTUAL VS. ALLOWABLE)

OPEN ITEMS

- o SYSTEM FOR TRACKING PENDING FSAR CHANGES
- o REVIEW OF VENDOR FABRICATION DRAWINGS
- o ADDITIONAL DOCUMENTATION FOR SEISMIC QUALIFICATION OF DIESEL FUEL STORAGE TANKS

04-10-85
EXHIBIT VI.8

CECo QUALITY ASSURANCE
CLINTON IDR AUDIT - BYRON/BRAIDWOOD
01-21-85

ASSESSMENT FROM AUDIT REPORT . . .

"THE BYRON/BRAIDWOOD PERSONNEL WERE ACUTELY AWARE OF THE TYPES OF CONCERNS (OR SIMILAR ONES) EXPRESSED IN THE CLINTON IDR, AND HAVE MADE ADEQUATE PROVISIONS TO DEAL WITH THEM. THAT AWARENESS USUALLY WAS NOT DUE TO THE CLINTON IDR BUT RATHER WAS OBTAINED BY EXPERIENCE RELATED TO INTERFACING WITH THE NRC (SUCH AS IE BULLETINS), AND THE PROJECT EXPERIENCE SUCH AS THE IDI AND IDR ON BYRON UNIT 1. BASED UPON THE AUDIT SAMPLES EXAMINED, ALL THE CONCERNS EXPRESSED IN THE CLINTON IDR ARE ALREADY BEING ADDRESSED IN AN ACCEPTABLE MANNER BY THE BYRON/BRAIDWOOD PROJECTS."

COMMONWEALTH EDISON
QUALITY ASSURANCE DEPARTMENT
SELF DIRECTED ENGINEERING ANALYSIS PROGRAM

BASED ON

- DESIGN ANALYSIS AUDITS - CECo QA
- DESIGN ANALYSIS AUDITS - CONSULTANTS
- VERIFICATION OF BYRON 1 IDI
- VERIFICATION OF CLINTON IDR

CONCLUSION

- NO SIGNIFICANT DESIGN PROBLEMS
- CECo AND S&L HAVE ADEQUATE CONTROL OVER DESIGN
- DESIGN PROCESS COMPLIES WITH FSAR COMMIT-
MENTS AND NRC REGULATIONS

CONCLUSION

- BYRON AND BRAIDWOOD HAVE BEEN EXTENSIVELY DUPLICATED
- ISSUES FROM BYRON 1 IDI AND IDR AND CLINTON IDR HAVE BEEN ADEQUATELY ADDRESSED IN THE DESIGN OF BYRON 2 AND BRAIDWOOD 1 AND 2.
- CECo AND S&L QA FOLLOW-UP ACTIONS ARE ASSURING THESE ISSUES ARE BEING PURSUED TO A PROPER CONCLUSION.
- WE BELIEVE THE DESIGN PROCESSES FOR BYRON 2 AND BRAIDWOOD 1 AND 2 MEET THE REGULATIONS AND LICENSING COMMITMENTS; THEREFORE, THERE IS NO NEED TO PERFORM ADDITIONAL INDEPENDENT DESIGN REVIEWS ON BYRON 2 OR BRAIDWOOD 1 AND 2.