

The Light company

Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

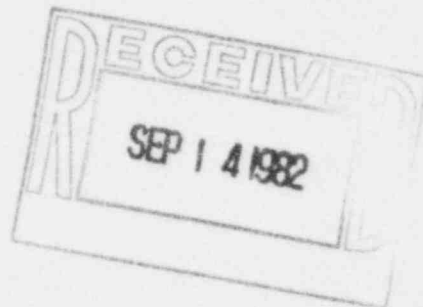
September 13, 1982

ST-HL-AE-880

File Number: G12.96

SFN: V-0530

Mr. John T. Collins
Regional Administrator, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Dr., Suite 1000
Arlington, Texas 76012



Dear Mr. Collins:

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Fifth Interim Report
Concerning Computer Program Verification

On May 8, 1981, Houston Lighting & Power Company (HL&P), pursuant to 10 CFR 50.55(e), notified your office of an item concerning computer program (code) verification. The verification methods lacked adequate visibility to the user as to whether or not the program versions in use had been verified. The information supplied in this report represents our Fifth Interim Report.

As previously discussed in our Third and Fourth Interim Reports, a consultant firm was engaged by Brown & Root, Inc. (B&R) to address the appropriateness of the modeling options, acceptability of code usage, and acceptability and adequacy of the methods selected for computer program verification. As a result of a review by Bechtel of B&R subcontract activities, Bechtel recommended that the consultant's work be terminated to avoid unnecessary duplication of Bechtel transition reviews of past B&R engineering work. Based on the Bechtel recommendation and, additionally, in recognition that the consultant's scope of work was not dispositive of the computer program verification issue, HL&P directed B&R to terminate the consultant's work in December 1981 except for preparation of a report covering the work already accomplished. The consultant prepared and submitted a report on the work completed prior to contract termination. This consultant's report was transmitted to BPC for resolution of this item.

As part of Bechtel's efforts to resolve this issue, a method was developed for use by the various Bechtel engineering disciplines during their review of B&R computer calculations. Details of the Bechtel method for finalizing B&R computer calculations are provided in Attachment 1 to this report.

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The consultant's review of B&R's Nuclear Analysis Disciplines computer program verification reports (CPVR's) and calculations included 26 CPVR's and 147 calculations. However, there was not necessarily a one-to-one correlation of calculations and CPVR's (i.e. QAD CPVR's were reviewed, but no calculations using these codes were). Therefore, status of CPVR's and calculations is presented separately.

The consultant's report reviewed 147 B&R calculations performed by the B&R Nuclear Analysis Discipline that had utilized computer codes. Of that number 54 had been revised, not used in the design or had been superseded by other calculations primarily performed by NUS. Ten calculations have been or are in the process of being superseded by Bechtel calculations either because the design has changed or inadequate computer program verification was found. There are currently 43 calculations that have been identified as requiring change primarily for design criteria reasons. Four calculations have been identified as desirable to keep pending verification of the computer programs. Thirty-six calculations are still undergoing review.

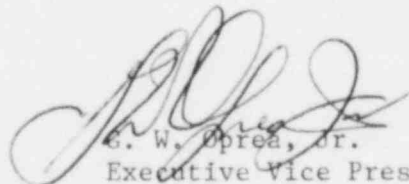
Of the 26 CPVR's reviewed by the consultant, Bechtel is considering retaining 5 codes, not retaining 13 codes and has not completed its evaluation on the remaining 8 codes. The 13 codes are not being considered for retention because the calculations utilizing them have been redone by NUS, require rework because of design changes or the CPVR is inadequate. For those codes not retained the calculations will be redone using a verified code. For those codes retained the CPVR will either be made consistent with paragraph 5 of Bechtel Engineering Department Procedure (EDP) 4.36 to the satisfaction of the Engineering Group Supervisor (EGS) or the calculation verified to EDP 4.37 as is shown in the figure in Attachment 2.

B&R also identified 57 significant computer programs used by the remaining disciplines on the South Texas Project (STP). Of this number BPC is considering retaining 34 codes, not retaining 17 codes and has not completed its evaluation of the remaining 6 codes. Of those not being retained, 10 cases result from deficient CPVR's and 7 cases from a need to redo calculations for other reasons.

The next report concerning this item will be submitted to your office by December 22, 1982.

If you should have any questions concerning this item, please contact Mr. Michael E. Powell at (713)877-3281.

Very truly yours,



G. W. Oprea, Jr.
Executive Vice President

MEP/mg

Attachment

Houston Lighting & Power Company

cc: G. W. Oprea, Jr.

J. H. Goldberg

J. G. Dewease

J. D. Parsons

D. G. Barker

C. G. Robertson

R. A. Frazar

J. W. Williams

R. J. Maroni

J. E. Geiger

H. A. Walker

S. M. Dew

J. T. Collins (NRC)

D. E. Sells (NRC)

W. M. Hill, Jr. (NRC)

M. D. Schwarz (Baker & Botts)

R. Gordon Gooch (Baker & Botts)

J. R. Newman (Lowenstein, Newman, Reis, & Axelrad)

STP RMS

Director, Office of Inspection & Enforcement

Nuclear Regulatory Commission

Washington, D. C. 20555

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G. W. Muench/R. L. Range
Central Power & Light Company
P. O. Box 2121
Corpus Christi, Texas 78403

Charles Bechhoefer, Esquire
Chairman, Atomic Safety & Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

H. L. Peterson/G. Pokorny
City of Austin
P. O. Box 1088
Austin, Texas 78767

Dr. James C. Lamb, III
313 Woodhaven Road
Chapel Hill, North Carolina 27514

J. B. Poston/A. vonRosenberg
City Public Service Board
P. O. Box 1771
San Antonio, Texas 78296

Mr. Ernest E. Hill
Lawrence Livermore Laboratory
University of California
P. O. Box 808, L-46
Livermore, California 94550

Brian E. Berwick, Esquire
Assistant Attorney General
for the State of Texas
P. O. Box 12548
Capitol Station
Austin, Texas 78711

William S. Jordan, III
Harmon & Weiss
1725 I Street, N. W.
Suite 506
Washington, D. C. 20006

Lanny Sinkin
Citizens Concerned About Nuclear Power
5106 Casa Oro
San Antonio, Texas 78233

Citizens for Equitable Utilities, Inc.
c/o Ms. Peggy Buchorn
Route 1, Box 1684
Brazoria, Texas 77422

Jay Gutierrez, Esquire
Hearing Attorney
Office of the Executive Legal Director
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Revision Date 08-23-82

BECHTEL'S PROGRAM TO FINALIZE
BROWN & ROOT, INC. COMPUTER CALCULATIONS

Each Bechtel discipline will review the Brown & Root, Inc. (B&R) calculations and associated Computer Program Verification Reports (CPVR's), turned over during the Transition Phase as part of the work package reviews, and develop their status. As a result of this effort along with his previous experience, the Bechtel Engineering Group Supervisor (EGS) will establish which calculations are required to document his design effort. In order to minimize the recalculation effort the EGS will use B&R calculations previously transmitted in all cases where their appropriateness and correctness can be verified in line with the attached flow chart and as discussed below.

- A. If the calculation is not required as part of the design bases documentation it will be marked Preliminary and filed under Preliminary or Superseded Calculations.
- B. If the calculation is required as part of the design documentation and, in the judgement of the EGS, is appropriate and meets all other Industry Codes or Standards associated with the design, it must still meet certain standards of acceptability as delineated in Bechtel Engineering Department Procedures (EDP's) 4.36 and 4.37 before it can be marked Final.
 1. B&R calculations developed using codes with documented CPVR's consistent with B&R procedures may be marked Final if, in the judgement of the EGS, the verification adequately meets the requirements of Paragraph 5 of EDP 4.36. This level of acceptance is to be used only in the case of relatively simple "one of a kind" solutions and where, in the judgement of the EGS, the reasonableness of the solution is self evident.
 2. B&R calculations not meeting the "one of a kind" criteria of Paragraph 1 or calculations which, while meeting B&R criteria for code verification, do not meet the requirements of EDP 4.36 but, in the judgement of the EGS, were made with the valid codes, must be verified before acceptance as final in accordance with EDP 4.37. As a minimum this verification can be accomplished using limited reruns or bounding calculations of the design problems on the similar verified versions of BPC or contractor codes. If, in the judgement of the EGS, the reruns provide reasonable and consistent results, he can accept as Final, single or groups of calculations encompassed by this verification.
 3. B&R calculations which, in the judgement of the EGS, do not meet the criteria of Paragraph 1 or 2 above, must be redone in accordance with EDP 4.36 or 4.37 before they can be accepted as Final by the EGS.

In addition to the above verification effort, from time to time, Discipline Chiefs, at their discretion, may require that calculations be given additional review prior to acceptance, and will so advise the EGS.

VERIFICATION PROGRAM FOR B&R COMPUTER CALCULATIONS

