



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

April 16, 1982

Mr. James G. Keppler, Regional Administrator  
Directorate of Inspection and  
Enforcement - Region III  
U.S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Subject: Dresden Station Units 1 and 2  
Quad Cities Station Units 1 & 2  
Final Response to Inspection  
Reports 50-237/82-01, 50-249/82-01,  
50-254/82-01 and 50-265/82-01  
NRC Docket Nos. 50-237/249/254/265

- Reference (a): C. E. Norelius letter to Cordell  
Reed dated February 16, 1982.
- (b): T. J. Rausch letter to J. G. Keppler  
dated March 2, 1982.
- (c): L. O. DelGeorge letter to J. G. Keppler  
dated April 1, 1982.

Dear Mr. Keppler:

Reference (a) provided the results of a special inspection conducted by Mr. I. T. Yin of your office on January 4-7, 1982 at EDS Nuclear Inc., Walnut Creek, California, of activities at Dresden Units 2 and 3 and Quad Cities Units 1 and 2. The attachment to this letter provides the Commonwealth Edison Company response to the Notice of Violation item 1. The response to the other items was provided in Reference (c).

The details of our proposed response to this item have been discussed with Mr. D. Danielson of your office on numerous occasions, including telephone conference calls with Mr. R. Bosnak, et al, of NRR on March 2 and March 18, 1982. As was discussed in depth in these conference calls, Commonwealth Edison believes that our method of performing I.E. Bulletin 79-14 operability analyses is technically justified, and results in the most expedient means of completing the I.E. Bulletin 79-14 program. The attached responses provides this justification and also discusses further measures we are taking to effect an early resolution of remaining I.E. Bulletin 79-14 work.

8207210210 820716  
PDR ADOCK 05000237  
Q PDR

APR 19 1982

April 16, 1982

Commonwealth Edison is modifying the existing priority system for completing the bulletin requirements so that one safe shutdown path at each unit will be documented as being seismically qualified by April 1, 1983. At this point in time, with all inside containment work completed as well, we will have documentation of the ability of the affected units to safely withstand a postulated seismic event.

In addition, we have made every effort to improve the overall I.E. Bulletin 79-14 completion schedules last presented in Reference (b). As discussed more completely in the attachment, we now expect to have all design work completed by December, 1982, and all modifications implemented by December 31, 1983. We believe that these schedule and prioritization improvements demonstrate our strong commitment to completing the I.E. Bulletin 79-14 effort as soon as possible.

To the best of my knowledge and belief the statements contained in the attachment are true and correct. In some respects these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees and consultants. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Please direct any questions you may have concerning this matter to this office.

Very truly yours,



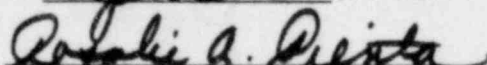
Wayne L. Stiede  
Assistant Vice-President

lm

cc: Region III Inspector - Dresden  
Region III Inspector - Quad Cities

Attachment

SUBSCRIBED and SWORN to  
before me this 16th day  
of April, 1982

  
Notary Public

Attachment

Dresden Units 2 and 3  
Quad Cities Units 1 and 2

Response to Notice of Violation

Commonwealth Edison Company

Docket No. 50-237

Docket No. 50-249

Docket No. 50-254

Docket No. 50-265

As a result of the inspection conducted on January 4-7, 1982 and in accordance with the Interim Enforcement Policy, 45 FR 66754 (October 7, 1980), the following violation was identified.

10 CFR 50, Appendix B, Criterion V, states in part that, "Activities affecting quality shall be prescribed in documented instructions, procedures or drawings . . . and shall be accomplished in accordance with these instructions, procedures or drawings".

Commonwealth Edison Company Topical Report CE-1-A, "Quality Assurance Program for Nuclear Generating Stations, Revision 15, dated January 2, 1981, states in Section 5, that "The quality assurance actions carried out for design, construction, testing, and operation activities will be described in documented instructions, procedures, drawings, specifications, or checklists. These documents will assist personnel in assuring that important activities have been performed. These documents will also reference applicable acceptance criteria which must be satisfied to assure that the quality related activity has been properly carried out."

Contrary to the above, the EDS IE Bulletin 79-14 evaluation procedure did not specify that an operability analysis be performed for the piping suspension system prior to declaring the system to be operable.

RESPONSE

Corrective Action Taken and the Results Achieved, and  
Corrective Action Taken to Avoid Further Noncompliance

The present methodology for the evaluation of the seismic capability of safety related piping systems in response to IE Bulletin 79-14 does not include procedures for operability evaluations of the entire piping suspension system. CECO would like to emphasize however, that operability evaluations are being performed on all piping systems with regard to pipe stress. And in specific cases, when piping stresses have been determined to exceed the operability criteria, hanger operability evaluations are performed. In our judgment this method is adequate. There is sufficient technical evidence to justify our current methodology. This technical justification is presented below.

There are four major issues that collectively form the technical basis for not evaluating support operability on Dresden and Quad Cities IE Bulletin 79-14 effort. These four items include:

- I. Elastically-predicted support loads above FSAR allowables by a factor of 5 to 6 should in general, maintain piping system operability.
  - II. History of past operability evaluations and their results.
  - III. Status of the inaccessible pipe support evaluations.
  - IV. Status of the accessible pipe support evaluations.
- I. During the course of piping system operability evaluations on the Dresden and Quad Cities Control Rod Drive Insert/Withdraw lines, it was observed that loads predicted by linear-elastic analytical techniques were 5 to 6 times greater than the FSAR allowables. Application of non-linear analysis techniques demonstrated piping system operability. Therefore, a significant safety factor exists. Major contributions to this safety factor are based on the following specific items:
1. Piping analysis uses a 0.5% damping response spectra for the 79-14 work. For operability analysis, a 2 to 3% damping site specific spectra can be used as allowed by SEP criteria NUREG/CR-0098 and NRC Regulatory Guide 1.61. Therefore support loads for operability are approximately 65% of the 79-14 predicted loads.
  2. The 79-14 design loads for the supports include thermal expansion loads. For operability evaluations, thermal loads should not be combined with seismic loads. This represents a safety factor of approximately 1.5 to 2.0.
  3. Piping systems are redundantly supported. Therefore support yielding is not an inherent problem from a piping system operability standpoint. In the CRD Insert/Withdraw analyses, non-linear analysis techniques verified that the system was operable with 60% of the supports yielding.
  4. Support loads are limited, and less than predicted by an elastic analysis due to yielding of the pipe at the operability limits.
  5. The actual material strengths are generally higher than those specified for the FSAR analysis. A conservative estimate of this safety factor is 1.1.
  6. Yielding supports will absorb energy and reduce the total seismic response of the system. NUREG CR-0098, for example, allows for consideration of this inelastic energy absorption in SEP analysis. The CRD Insert/Withdraw analysis indicated that even with 3 of 5 supports yielding, the maximum pipe stress increased only slightly (18 ksito 21 ksi).

Based on studies performed on the CRD Insert/Withdraw lines, it can be concluded that pipe support loads are not a major technical concern for piping system operability. In the case of 79-14 supports, our experience indicates that support loads greater than FSAR allowables by a factor of 5 to 6 should in general, maintain piping system operability.

II. During the course of performing IE Bulletin 79-14 analysis on Dresden and Quad Cities, the following three piping systems were identified as not meeting the stress criteria for operability.

- Q1 STGA - 02C (Quad Cities #1)
- D3 HPCI - 09B (C) (Dresden #3)
- D2 HPCI - 09B (C) (Dresden #2)

Of these three lines, the D2 HPCI-09B(C) was declared inoperable during the Dresden 2 outage. Since the unit was shut down, pipe support operability was not evaluated and FSAR fixes were implemented prior to returning the unit to service.

Operability evaluations of the supports on the two other lines were performed as required by our program. The results of the evaluation are tabulated in Table I.

TABLE I SUPPORT OPERABILITY EVALUATION

ANALYSIS	NEW	MODIFIED	QUALIFIED	DIS-QUALIFIED	DELETED	SUPPORT TYPE
Q1-STGA-02C			- 4 3 1		1	Spring Hangers Rod Hangers U-Bolts Others (Sway Struts, frames etc.)
D3-HPCI-09B(C)			- - 2		1 3	Spring Hangers Rod Hangers U-Bolts Others (Sway Struts, frames etc.)
TOTAL	2	-	10	-	5	

Based on these evaluations, none of the existing supports failed to meet the operability criteria.



III. To date the inside drywell supports have been qualified, modified or new supports added as appropriate to meet the FSAR requirements. The following breakdown indicates the numbers of new supports modified or qualified:

Total number of as-built supports	713
Total number of supports requiring action	329
Total number of supports requiring no action	384
Of the 329 supports requiring action, number of supports modified	85
Number of new supports added	76

Based on the above data, only 12% of the total number of existing supports required modification to meet FSAR requirements. Secondly, of the 329 supports requiring action, 193 (59%) were spring hangers. Spring hangers are considered inactive during a seismic event and therefore would not have required operability evaluation. As a result over 80% of the supports would not have required operability evaluation at all. And as determined by the technical evidence presented, the remaining 20% would have passed operability using non-linear techniques if necessary.

IV. The major effort remaining is the accessible support design to meet FSAR requirements. Although the accessible area supports do not have such a high percentage of spring hangers, the past evaluations for FSAR indicate that spring hangers and rod hangers were rarely modified for FSAR. It is estimated that spring hangers and rod hangers constitute 40% of the existing accessible supports. CECO is confident that the remaining 60% could be qualified within operability limits. The technical justification demonstrated that even if some hangers/supports yield piping system integrity is not degraded. In conclusion, the technical justification presented and past experience demonstrate that hanger operability evaluations have little significance in determining piping system operability.

In addition to the technical evidence presented above, the requirement to perform hanger operability would severely impact our current schedule and cash flow. As the NRC is aware, in many cases, original hanger design documentation is not available. As a result a much more detailed analysis is required for each hanger. This is a timely and costly process and would not enhance public safety if this analysis is required for operability purposes on the entire piping suspension system.

Given our current methodology we can prioritize and improve our current schedule so that CECO can achieve compliance with the intent of IE 79-14 at an earlier date; that is to qualify all safety related piping to within FSAR allowables at the earliest possible time. For comparison, the following is a brief description of CECO's current status:

As of April 30, 1982, inside drywell primary coolant boundary piping analysis, support designs, and field installation of supports to meet FSAR requirements will be complete on all units.

As of April 30, 1982 all accessible as-built piping analyses to evaluate the pipe stresses from an operability standpoint will be completed. At this point it is reasonable to conclude that no additional piping systems with operability problems will be identified.

For accessible piping the support designs to meet FSAR requirements will be issued by October 1, 1983.

CECo plans to improve the schedule in the following ways.

A safe shut down path has been established and all construction drawings will be issued by the end of July 1982. The safe shutdown path will be seismically qualified to FSAR criteria for all four units no later than April 1, 1983.

All construction drawings to complete the entire 79-14 effort are expected to be issued by December 1982, in the following manner. All drawings will be issued for Quad Cities Unit 2 and Dresden Unit 2 by November 1982 and for Quad Cities Unit 1 and Dresden Unit 3 by December 1982.

All modifications/installations are to be completed for the entire 79-14 effort by December 31, 1983. This is a very optimistic construction schedule, however, and there are several qualifying factors explained below. These factors prevent the development of a more detailed construction schedule, except for the fact the safe shutdown path is to be completed at each station as a first priority.

CECo would like to emphasize that the date for the completion of I.E. Bulletin 79-14 work is very optimistic, and that there are several factors that can impede the achievement of the projected end date. These factors are listed as follows:

1. From a logistic standpoint, there are a significant number of designs that have to be incorporated within the plants in the specified time frame. Currently the estimated number of designs for all four units is 1950. This will require an extensive labor force.
2. Labor availability is dependent on seasonal variations. That availability is expected to be less during the summer months.
3. Other major modification work such as torus attached piping will be performed in concurrence with the 79-14 effort.

4. Three scheduled outages will occur in this time frame, each approximately two months in duration. During these times emphasis will be placed on outage related activities.
5. Material availability will be the most significant factor. CECO has experienced delays in the receipt of material/hanger components under normal conditions. The increased output of designs within a shorter time frame is expected to place great burdens on vendor supplying these parts.

In conclusion, even if the projected completion date cannot be met, an improvement in our current schedule will be seen by continuing with our current methodology.

Date of Full Compliance

Full compliance has been achieved.