

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
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COMMONWEALTH EDISON COMPANY )  
)  
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LaSalle County Nuclear )  
Generating Station, Unit 1 )  
and Unit 2 )  
)  
)  
)

Docket Nos. 50-373  
and  
50-374

COMMENTS OF THE PEOPLE OF ILLINOIS  
ON COMMONWEALTH EDISON COMPANY'S  
PRESENTATION OF MARCH 31, 1982

The People of the State of Illinois (Illinois), by  
TYRONE C. FAHNER, Attorney General of the State of Illinois,  
submit the following comments following the presentation made by  
Commonwealth Edison Company (Edison) to the Director of Nuclear  
Reactor Regulation and the NRC staff, on March 31, 1982. These  
comments are limited to certain aspects of Edison's presentation  
and are not intended to be comprehensive in scope. It is hoped  
that the NRC staff will consider the points raised here as part

of its detailed investigation of the facts in this matter.\*

I. CORED HOLES FOR PIPE AND CONDUIT PASSAGE

No general written specifications have been presented for the drilling of cored holes which pass completely through safety related concrete structural elements. Mr. Longlais submitted a 2-paragraph summary of the engineers' procedures. Exhibit 2. A review of Edison's exhibits and of the discussion about coring practices reported in the transcript, discloses the following:

- A. There are no specific analytical criteria for the locating of passageway holes.
- B. No written analytical assessment or structural calculations were made of rebar damage in the drilling of holes either before or after the holes were drilled. (Transcript, pp. 33-34).

\* As part of its presentation, Edison submitted:

1. A written "Response to Petition Made By The Office Of The Attorney General, State of Illinois, In The Matter Of Reinforcing Steel Damaged During Installation of Cored Holes And Concrete Expansion Anchors, LaSalle County, Units 1 and 2." (Response)
2. A written summary of engineering practices consisting of six pages of notes and drawings and a 2-page Table, identified as Exhibits 1-8, Longlais.
3. A set of 90 drawings of certain structural elements in Unit 1 only, identified as Exhibit 3A.
4. Specifications for Concrete Expansion Anchor Work, LaSalle County Station--Units 1 and 2, Revisions 0 through 8, 1976-81, by Sargent & Lundy Engineers. Identified as Exhibit 4A. (Expansion Anchor Specifications).

C. No reporting requirement has been identified for rebar damage in the drilling of passageway holes at any time from 1976 to the present. It is not clear from the information provided on March 31, 1982 whether such reports were in fact made on a regular basis.

D. It is unclear therefore how specific instances of rebar damage in passageway holes could have been reported on the Rebar Hit Schedule (RHS) drawings submitted on March 31, 1982 as Exhibit 3A. Nor is there any information as to how many steel bars were discounted for each reported passageway hole.

E. Two examples have been provided of instructional notes on individual design drawings where engineering judgment had determined that reinforcing steel should not be cut.\* In each case, the use of a metal detector was required. However neither note expressly prohibited the cutting of rebar. Furthermore, there is no evidence of field verification of compliance with the instructional notes.

F. Such notes were added to the drawings only after the engineers became "concerned" that a particular element could not tolerate many more damaged rebars. (Transcript. p. 37) Implicit in this procedure is the

\* Commonwealth Edison's Response, pp. 4-5.

assumption that previous passageway coring had in fact caused some significant amount of rebar damage. This is entirely consistent with the statement in the [REDACTED] affidavit that we "seldom failed to contact rebar" in drilling the larger diameter holes.\*

G. The two specific instances of severe rebar damage cited in the [REDACTED] affidavit are acknowledged by Edison to have occurred. (Transcript. p. 62) No explanation has been offered for these nonconformances, nor has any estimate been provided of the frequency of such occurrences.

## II. DRILLED HOLES FOR EXPANSION ANCHOR BOLTS

A review of the Expansion Anchor Specifications and eight revisions thereof for drilled expansion bolt holes, indicates the following facts:

A. From December 1976 until July 1979 the cutting of rebar was allowed in 'non-critical' areas of safety related structures without restriction. Revisions 0, 1, 2. It is not known whether the impact of seismic events or loss of coolant accidents was factored into the definition of non-critical areas. Nor are there Quality Assurance specifications for the identification

\*Request To Institute Show Cause Proceeding, Exhibit 1, p.3.

of critical and non-critical areas in the field.

B. No reporting requirements existed for rebar cutting in non-critical areas of safety related structures from December 1976 to July 1979. Revisions 0, 1, 2, Table 38-2. It is therefore unclear how "all rebar damage at the site" could be verified on Exhibit 3A. (Transcript, p. 41).

C. From July 1979 to the present, one rebar cut for each four-hole plate was permitted in non critical areas of safety related structures without prior approval. See Article 3.2.9d of Revision 3,4,5,6,7,8.\*

D. Reporting forms for rebar damage in drilled holes do not appear in the Specifications until July 1979. Revision 3. No information is given as to specific reporting procedures, even where reporting was required, from December 1976 to July 1979. It is known that contractors were not required to distinguish between nickel steel and cut steel until July 1979. (Transcript, p. 49). Verification that damaged rebar had been reported was not included in the Quality Assurance specifications until July 1979. Revision 3, Article 1.5.2g.

\*Commonwealth Edison's "Response" is in error on this point. (Response, p.9, discussion of Revisions 4-9).

E. No provision is made in the reporting forms for verifying that a metal detector was actually used, nor was such verification included in the Quality Assurance specifications. Revisions 0-8. Reference to reinforcing placement drawings was permitted, but not required, during the location of holes in critical areas of safety related structures, from 1979-1981. Revisions 3-8, Article 3.2.8. Such reference was not even recommended during 1976-1979. Revisions 0, 1, 2, Article 3.1, Table 38-2.

### III. CORED HOLES FOR ANCHOR BOLTS

The drilling of cored holes for grouted anchor bolts began in July 1980. By this time a procedure had been instituted to notch the concrete elements to expose the reinforcing steel before drilling began. Even so, rebar damage was experienced and reported on RHS drawings. (Transcript, p. 42) Rebar cuts due to cored anchor bolt holes were "recently" plotted on the drawing known as Exhibit 3A. (Transcript, pp.27-28)

### IV. SCOPE OF DATA PRESENTED

Edison's written Response refers to LaSalle Units 1 and 2, as do the Expansion Anchor Specifications. The 90 RHS drawings submitted to the NRC staff, however, relate to Unit 1 only. (Transcript, p. 41) Some of the buildings at the LaSalle County



Station house equipment for Units 1 and 2 jointly, for example the Auxilliary Building. It is unclear therefore how Exhibit 3A treats rebar damage in such buildings.

#### CONCLUSIONS

The following tentative conclusions are drawn from the information provided by Commonwealth Edison to the NRC Staff on March 31, 1982.

1. No calculations or detailed engineering analyses were ever made to assess the effect of rebar damage upon the integrity of safety related structures, either before or after drilling, prior to the filing by the State of Illinois of the pending Request pursuant to 10 C.F.R. §2.206. The overall "assessment" of the accumulated effect of damaged reinforcing steel during the final load check (Longlais Exhibit 6; Transcript, p.52) has consisted merely of the application of engineering judgment, without benefit of detailed analysis. This general approach is contrary to the opinion stated by Mr. Longlais that whether the safety or integrity of the structures has been impaired, and whether there is still sufficient margin to carry the design loads, "has to be determined on a case-by-case basis. That is not a function of percentages." (Transcript, p. 49) A case-by-case analysis, such as recommended by Edison's engineer, is exactly what Illinois has requested.

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2. No general written procedures governed the drilling of cored passageway holes from 1976 to the present. The amount of rebar damage due to core drilling was not stated or even estimated. It may be reasonably inferred that rebar damage in passageway holes was quite common.

3. The selection of nine structural elements, which "looked" as if they had higher concentrations of rebar damage than what was "normally" seen on the RHS drawings (Transcript, p.54, 57), does not constitute a sufficient analytical assessment of the damage. Only six cored holes are included in the sample; and it is not known whether these were passageway holes or grouted anchor holes. (Longlais, Exhibit 7, Table 3-1) In one beam which was apparently designed to carry a heavy load, the damage in a single expansion anchor hole reduced the design margin by 12%. (Longlais, Table 3-1, Area 3) In one reactor wall the rebar damage reduced the design margin to 1.05, where a margin of 1 is the lower limit of safety. (Longlais, Table 3-1, Area 1) Further analysis is required to determine whether other structural elements are that close to the design margins as a result of rebar damage. Illinois shares the concern expressed by Director Denton on several occasions during Edison's presentation that the sample is too small. — <sup>See also</sup> ~~Transcript~~ (Transcript, pp: 66-68, 70-71, 75) Because the sample includes less than 1% of the holes over 2 inches in diameter, and only about 3% of the total number of damaged bars, there is a serious question whether Table 3-1 provides statistical confidence that safety related structures will perform their functions.



4. The completeness of the Rebar Hit Schedule drawings, Exhibit 3A, is uncertain due to: (a) the absence of any reporting requirements for the drilling of passageway holes from 1976 to the present; (b) the absence of specific reporting requirements for critical areas prior to July 1979; and (c) the absence of any reporting requirements for non-critical areas, prior to July 1979.

5. Only through a complete and detailed analysis of all existing rebar damage reports can the extent of the damage be estimated. To date no such analysis has been made. Because rebar cutting was allowed without restriction in non-critical areas of safety related structures, without reporting requirements, from December 1976 to July 1979, and because there were apparently no reporting requirements for rebar damage in passageway holes at any time, the actual total amount of damaged rebar probably cannot be accurately documented.

6. The existence of eight revisions to written specifications for the drilling of expansion anchor holes does not compel the conclusion that those specifications were complied with. Edison bases its conclusion that its control program was followed upon a finding that driller [REDACTED] foreman participated in more than one training session conducted by the contractor Foley Electric. (Transcript, pp. 27-28) This same foreman, according to [REDACTED] affidavit, directed [REDACTED] to drill through rebar when it was contacted as a usual practice. A Foley superintendent on at least

two specific occasions directed [REDACTED] to drill large diameter cored holes through the reactor building walls under circumstances which could not have been condoned by "engineering judgment." The affidavit also raises questions about the actual use of metal detectors and their effectiveness in preventing rebar damage when coring drills were used. In the face of such allegations, Edison's confidence in its training program as an indication of compliance is apparently misplaced.

Respectfully submitted,

PEOPLE OF THE STATE OF ILLINOIS

TYRONE C. FAHNER  
Attorney General  
State of Illinois

BY: Judith S. Goodie  
Judith S. Goodie  
Assistant Attorney General

Environmental Control Division  
188 West Randolph Street  
Suite 2315  
Chicago, Illinois 60601  
(312) 793-2491

April 13, 1982

PROOF OF SERVICE

I, Harry Harris, being sworn and under oath do state that on April 13, 1982 I served the foregoing Notice of Filing and Comments of the People of Illinois on Commonwealth Edison Company's Presentation of March 31, 1982 upon the persons to whom said Notice is addressed, by first class mail, postage prepaid, except that Director Denton was served by express mail, at the U.S. Postal Service, 160 N. LaSalle Street, Chicago, Illinois 60601.

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Harry Harris

SUBSCRIBED AND SWORN TO  
BEFORE ME THIS 13th DAY  
OF APRIL, 1982

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NOTARY PUBLIC