Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

December 12, 1994

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Subject: LaSalle County Nuclear Power Station
Individual Plant Examination and Individual Plant Examination (External Events) Submittal
NRC Dockets 50-373 and 50-374

Reference: April 28, 1994 letter from Martin J. Vonk to William Russell, same Subject.

The referenced letter transmitted the LaSalle County Station Individual Plant Examination (IPE) report. Recent information we have received indicates that some statements made in that submittal were incorrect.

Due to apparent miscommunications within ComEd concerning modifications which had been made to the RCIC system, we incorrectly informed you in the referenced submittal that "the 'sneak circuit' problem has been corrected by a plant modification."

Although the referenced submittal satisfied the Generic Letter 88-20 requirements, ComEd has elected to perform its own Level 2 internal events PRA for LaSalle. During this effort, while reviewing the electrical prints, we could find no changes to the logic which would address the "sneak circuit" problem. Recent discussions with station personnel confirmed that no modifications to this circuit had actually been performed. However, changes have been made to LaSalle Procedure LOA-AP-07, "Loss of Auxiliary Electrical Power" which identify the sequence of events which will result in the non-recoverable isolation of the RCIC inboard steam isolation valve. In addition, the operators receive training during every training cycle targeted specifically at the "sneak circuit" concern.

ComEd has reviewed and evaluated the current configuration and related procedural and training enhancements. Applying the human error probability (HEP) methodology (NUREG/CR-1278) to this operator action, the calculated probability of an operator failing to restore the RCIC isolation valve to its normal open position is 0.05. Applying this value to the RMIEP results identified in the referenced submittal would reduce the contribution to core damage events for sequences involving the sneak circuit from 21% to approximately 1% of the total CDF.

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In addition, the RMIEP study assumed that the sneak circuit will always cause the RCIC isolation valve to close following restoration of AC power to the bus. In the most recent actual loss of power event with subsequent restoration of power, the valve did not close. A review of the relays involved in the "relay race" which occurs to make the valve close indicates that the likelihood of the valve closing may be very small. The relay which must change state to close the valve is a GE HFA relay while the relay which must change state to prevent closing the valve is an Agastat relay. The Agastat relay operating time is significantly faster than the HFA relay operating time (approximately a factor of four). This difference means that the relay race should be "won" by the Agastat relay, preventing the valve from closing. This situation would further reduce the "sneak circuit" contribution to total CDF to a value below 1%.

In conclusion, although no modification to the "sneak circuit" was made, the incorporated procedure changes and operator training, coupled with the operating characteristics of the relays, provide a similar level of reduction in total calculated core damage frequency.

Enclosed are copies of the corrected pages of the LaSalle County Station Individual Plant Examination Submittal Report addressing the above concerns. One copy designates the changes with redline and strikeout notations for your convenience. The other copy designates the changes with change bars in the right margin. We apologize for any inconvenience this may have caused.

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

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

Respectfully,

Gary G Benes

Gary G. Benes
Nuclear Licensing Administrator

Subscribed and Sworn to before me
on this 12 day of
December, 1994.

Jacqueline T. Evans
Notary Public

OFFICIAL SEAL
JACQUELINE T EVANS
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES: 12/15/97

Attachments: 1) LaSalle RMIEP IPE Submittal Executive Summary, page ES-4
2) LaSalle RMIEP IPE Submittal Summary, pages 26, 27, and 46

cc: J. B. Martin, Regional Administrator - RIII
W. D. Reckley, LaSalle Project Manager - NRR
P. G. Brochman, Senior Resident Inspector - LaSalle
Office of Nuclear Facility Safety - IDNS

CONCLUSIONS

The LaSalle County Station RMIEP project resulted in a very comprehensive PRA. It has provided CECo with a new level of understanding of the plant and its behavior under a variety of potential accident scenarios.

The LaSalle mean core damage frequency due to internal events was determined by the RMIEP analysis to be 4.4E-05 per year. Of the total core damage frequency, over 64% is due to one sequence in which a transient is followed by failure of all high and low pressure injection. The contribution to core damage due to external events is composed of contributions for fire, seismic and for internal flooding. The mean core damage frequency for fire events is 3.2E-05 per year. The mean core damage frequency for internally initiated flood events is 3.4E-06 per year. The mean core damage frequency for seismic events is 7.6E-07 per year. These results are within the NRC's safety goals.

Commonwealth Edison's RMIEP analysis team has performed the review of the RMIEP study for applicability as CECo's response to the objectives of Generic Letter 88-20 for LaSalle County Station. As a result, CECo personnel have developed a unique understanding of the behavior of the LaSalle plant under accident conditions and of the total plant capabilities to respond to accidents.

Because of the plant configuration cutoff date of 1985 and because of methodology differences, CECo feels that reanalysis would show that the dominant contributors to core damage would change and that sequences that are currently important would be significantly less important or eliminated. Specifically, the contribution from the dominant RMIEP sequences (representing 95% of the internal events core damage frequency) would be significantly reduced by the procedure change and operator training addressing the RCIC "sneak circuit" ~~modification~~, a more realistic model of the common cause failures of diesel generator cooling, and credit for the ECCS pumps operability under low NPSH conditions.

Although CECo identified several technical concerns with the RMIEP analysis process, the principal purpose of the LaSalle County Station RMIEP IPE/IPEEE was to develop an understanding of the severe accident behavior of LaSalle and of the severe accidents postulated by the analysis. It accomplished this purpose. CECo has gained a better understanding of the probability of core damage at the LaSalle County Station as a result of this review. The numerous insights developed during the LaSalle RMIEP IPE/IPEEE process will be provided to the station for disposition. Those insights dealing with accident management will form the basis for future development and implementation of the LaSalle County Station Accident Management program.

5.3 Dominant Cutset Analysis

Sequence T100

The top sixteen cutsets contributing to sequence T100 account for 80.6% of the T100 frequency, with the top two cutsets alone accounting for 61.7%. The most significant component failures and failure modes contributing to this sequence are represented by the basic events described in Table 5-5.

The first two basic events associated with T100 were linked to a RCIC "sneak circuit" issue. This issue is addressed in NUREG/CR 4832 Vol 3, Part 1, Section 7.2 and in NUREG/CR 4832 Vol 4, Section 2.6.2. This "sneak circuit" would cause the isolation of RCIC each time a loss of offsite power occurred (found during simulator exercises). Under these conditions a false, loss-of-power induced high RCIC room temperature signal was generated and the in-board AC-powered isolation valve received a signal to close. However, the valve could not close because it had no AC power. When AC was restored to the valve, a relay race ensued, and the relay associated with room high temperature was energized before the loss of power contact opened. The valve would shut isolating RCIC because it "sensed" RCIC room high temperature before it "sensed" a loss of power. This event could occur during station blackout, loss of offsite power or due to a loss of a train of AC power. The "sneak circuit" problem has been corrected by a plant procedure change and operator training~~modification~~.

Our analysis of the procedure change, operator training, and the current hardware configuration indicates that the likelihood of the failure of RCIC due to the "sneak circuit" has been reduced by at least a factor of 20,~~If both of the events associated with the "sneak circuit" were eliminated from the quantification, the overall~~ reducing the core damage frequency contribution reported in RMIEP due to both "sneak circuit" events from ~~would be reduced by~~ about 21% to less than 1%. The third basic event is the common cause beta factor used to consider the likelihood of common cause failure of the CSCS pumps. The fourth basic event is the random failure of a CSCS pump.

Sequence T62

For sequence T62, the top 100 cutsets account for 79.8% of the T62 frequency and the top 10 cutsets account for 65.62%. The most significant component failures and failure modes contributing to this sequence are described in Table 5-6. The first basic event is the common cause beta factor used to consider the likelihood of common cause failure of the CSCS pumps. The second basic event is the random failure of a CSCS pump. These two basic events are the same as discussed in relation to T100. The third and fourth basic events are random failures of the diesel generators to start or to continue to run after starting.

Sequence T18, T20, and T22

The top 100 cutsets for T18, T20, or T22 are similar. The most significant component failures and failure modes contributing to these sequences are described in Table 5-7. It can be seen that the survivability of components and the containment leak location are the major contributors to the cutsets; these are even more important than the RHR components and the various supporting equipment.

Summary

Because of the plant configuration cutoff date of 1985 and because of methodology differences, CECo feels that reanalysis would show that the dominant contributors to core damage would change and that sequences that are currently important would be significantly less important or eliminated. Specifically, the contribution from the dominant RMIEP sequences (representing 95% of the internal events core damage frequency) would be significantly reduced by the procedure change and operator training addressing the RCIC "sneak circuit" ~~modification~~, a more realistic model of the common cause failures of diesel generator cooling, and credit for the ECCS pumps operability under low NPSH conditions.

8.0 Conclusions

The LaSalle County Station RMIEP project resulted in a very comprehensive PRA. It has provided CECo with a new level of understanding of the plant and its behavior under a variety of potential accident scenarios.

The LaSalle mean core damage frequency due to internal events was determined to be 4.4E-05 per year. Of the total core damage frequency, over 64% is due to one sequence in which a transient is followed by failure of all high and low pressure injection. The next most likely sequence (contributing 15% to CDF) is a transient in which all high pressure and low pressure injection systems (except RCIC) fail. The next three sequences collectively contribute approximately 16% to the total CDF. These sequences are similar and are due to failures of the ability to remove heat from the containment.

The contribution to core damage due to external events is composed of contributions for fire, seismic and for internal flooding. The mean core damage frequency for fire events is 3.21E-05 per year. The mean core damage frequency for internally initiated flood events is 3.39E-06 per year. The mean core damage frequency for seismic events is 7.58E-07 per year.

Commonwealth Edison's RMEIP analysis team has performed the review of the RMIEP study for applicability as CECo's response to the objectives of Generic Letter 88-20 for LaSalle County Station. They have, therefore, been intimately involved in the LaSalle RMIEP IPE/IPEEE process. As a result of this program, CECo personnel have developed a unique understanding of the behavior of the LaSalle plant under accident conditions and of the total plant capabilities to respond to accidents.

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Although there are several technical concerns noted in this summary document, the principal purpose of the LaSalle County Station RMIEP IPE/IPEEE was to develop an understanding of the severe accident behavior of LaSalle and of the severe accidents postulated by the analysis. It accomplished this purpose. CECo has gained a better understanding of the probability of core damage at the LaSalle County Station as a result of this review. The numerous insights developed during the LaSalle RMIEP IPE/IPEEE process will be provided to the station for disposition. Those insights dealing with accident management will form the basis for future development and implementation of the LaSalle County Station Accident Management program.

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