Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

April 29, 1990

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: LaSalle County Station Units 1 & 2
Supplemental Response to NRC Bulletin 88-04
"Potential Safety-Related Pump Loss"
NRC Docket Nos. 50-373 and 50-374

References: (a) NRC Bulletin No. 88-04 dated May 5, 1988
(b) W.E. Morgan letter to U.S. NRC dated July 11, 1988.

Dear Sir:

Reference (a) requested that licensees investigate and correct as applicable two miniflow design concerns. The first concern involves the potential for the dead-heading of one or more pumps in safety-related systems that have a miniflow line common to two or more pumps or other piping configurations that do not preclude pump-to-pump interaction during miniflow operation. A second concern is whether or not the installed miniflow capacity is adequate for even a single pump in operation.

In Reference (b), when addressing the adequacy of the minimum flow bypass lines for safety-related centrifugal pumps at LaSalle County Station, Commonwealth Edison indicated that further vendor input and engineering evaluation would be necessary to verify that current miniflow rates are sufficient to ensure that there will be no pump damage from low flow operation.

Ingersoll-Rand (IR) the pump manufacturer of the High Pressure Core Spray (HPCS), Low Pressure Core Spray (LPCS), and Residual Heat Removal (RHR) pumps at LaSalle Station, developed and provided Commonwealth Edison (CECo) with an equation to predict remaining pump life as a function of previous pump operating history. Within this equation there were five "constants" with values assigned by IR for the LaSalle HPCS, LPCS, and RHR pumps. Using this information, Commonwealth Edisons Engineering Department estimated the equivalent annual service hours for each pump. It is CECo's opinion that the IR equation represents a very simplified model and that the estimated service hours from the equation are conservative. Ingersoll-Rand concluded that predicting remaining pump life is not an exact criteria, and that the actual service interval must be established from actual running experience versus accumulated operating hours, and should depend primarily on the performance characteristics (vibration, temperatures, leakage rates) being monitored. It is Edison's practice to perform service on pumps based upon detected degradation from surveillance testing and not upon accumulated pump run time.

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LaSalle Station conducts quarterly surveillance tests on its HPCS, LPCS, and RHR pumps to satisfy ASME Section XI pump performance requirements and to ensure the operational readiness of the pumps. Test data is trended and evaluated to detect any pump degradation and to determine if pump maintenance is needed. To this date, no noticeable pump degradation has occurred and no adverse trends have been identified.

Ingersoll-Rand additionally recommended that LaSalle continue to use the minimum flow values originally supplied by General Electric Company. Those values being HPCS-1000 gpm, LPCS-635 gpm, and RHR-550 gpm, which LaSalle's minimum flow lines are designed to provide. IR based their acceptance of the GE specified minimum flow rates on the assumption that the pumps operate for only short durations at the minimum flow rates. IR considers short period operation to be pump operation of 3 hours or less.

Ingersoll-Rand provided CECo with recommended minimum continuous duty flow rates (MCF) of: HPCS-1500 gpm, LPCS-2150 gpm, and RHR-2150 gpm. Ingersoll-Rand considers continuous operation to be any pump operation exceeding a 3 hour duration in a 24 hour period.

At LaSalle Station each pump utilizes a minimum flow and a full flow recirculation line. LaSalle tests each pump by running it on recirculation using the full flow recirculation line. The minimum flow line is used only during pump start-up, between the time the pump is started and until it reaches normal operating speed and discharge pressure. After the pump speed and discharge pressure have stabilized, a valve in the full flow line is opened to allow full flow thru the pump. The estimated time the pump spends on minimum flow is less than one minute during each test. Therefore, the Ingersoll-Rand specified MCF flow rates for LaSalle are only useful as input into IR's service life equation.

A precaution has been added, as a result of the Bulletin, to LaSalle Station's operating procedures which allows an ECCS pump to be secured and restarted as necessary to preclude running the pumps unnecessarily long at minimum flow.

CECo believes that LaSalle's current operating practices and performance monitoring surveillances meet the intent of Ingersoll-Rand's recommendations and assures the acceptable performance of the HPCS, LPCS, and RHR pumps. Based upon the responses from the pump suppliers coupled with the review of pump vibration data previously discussed in Reference (b) assurance is provided that operation of the LaSalle County pumps at low flow conditions will not cause pump damage.

Please address any questions that you or your staff may have concerning this response to this office.

Respectfully,

Wayne E Morgan

W.E. Morgan
Nuclear Licensing Administrator

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