Commonwealth Edison Company
1400 Opus Place
Downers Grove, IL 60515

November 30, 1995

ComEd

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

Subject: Dresden Nuclear Power Station Units 2 and 3
Third Ten-Year Interval Inservice Testing (IST)
Plan, Revision 3.
NRC Docket Nos. 50-237 and 50-249

References: (a) T.P. Joyce letter to NRC dated August 31, 1995

Reference (a) submitted Revision 3 to the Dresden Station Third Ten Year Interval Inservice Testing Plan. At that time, ComEd requested NRC staff review and approval within 90 days of receipt.

During a telephone conference with the staff on November 16, several questions were raised regarding Relief Request No. RP-11B. This relief request deals with limits on the frequency response range for vibration monitoring equipment for the Standby Liquid Control (SBLC) pumps. After taking in consideration those questions and further discussions with the SBLC pump vendor, ComEd has decided to revise Relief Request RP-11B.

Attached is the revised relief request (RP-11C). No other changes in the IST program are requested at this time. The revised relief request meets the requirements of ASME/ANSI OM (Part 6) as well as the proposed IST program and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants". If there are any questions concerning this letter please contact this office at (708) 663-7292.

Sincerely,

Bob Rybak
Nuclear Licensing Administrator

Attachment: Relief Request No. RP-11C

cc: H. Miller, Regional Administrator - RIII
J. Stang, Project Manager - NRR
C. Vanderniet, Senior Resident Inspector - Dresden
Office of Nuclear Facility Safety - IDNS

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RELIEF REQUEST NUMBER RP-11C

DESCRIPTION

Frequency response range of vibration monitoring equipment for the Standby Liquid Control (SBLC) pumps.

COMPONENT IDENTIFICATION/FUNCTION

PUMP	CLASS	P&ID CORD	FUNCTION
2A-1102	2	33/D7	Standby Liquid Control Pump
2B-1102	2	33/E7	Standby Liquid Control Pump
3A-1102	2	364/D7	Standby Liquid Control Pump
3B-1102	2	364/E7	Standby Liquid Control Pump

CODE REQUIREMENT(S)

ANSI/ASME OMa-1988, Part 6, Paragraph 4.6.1.6, Frequency Response Range: The frequency response range of the vibration measuring transducers and their readout system shall be from one-third minimum pump shaft rotational speed to at least 1000 Hz.

BASIS FOR RELIEF

The SBLC pumps are Model No. TD-60 triplex reciprocating positive displacement pumps which were supplied by Union Pump Company. The crankshaft bearings are tapered roller bearings. Reduction gears attached to the motor reduce the SBLC pump speed to 420 rpm, which corresponds to a frequency of 7 Hz.

The frequency response range required by the OMa-1988, Part 6, for these pumps is 2.3 Hz to 1000 Hz. Dresden Station has 2 vibration measurement systems. The very low frequency (VLF) system has a calibrated response range of 1 Hz to 500 Hz. The other vibration measurement system has a calibrated response range of 5 Hz to 10K Hz. Neither system satisfies the Code frequency response range requirement for the SBLC pumps.

Vibration measurements taken with two instruments with different frequency response ranges cannot be combined to provide a single number for comparison to the acceptance criteria of Part 6. The IRD FFT dataloggers in use at Dresden Station integrate measured vibrations over specific frequency ranges, or "bins", to obtain an overall (RMS) vibration levels. The datalogger then multiplies the RMS vibration values of each frequency bin by the square root of 2, sums the vibration values from all bins, and

displays the measured vibration as a single overall peak value. Therefore, the indicated value is dependent not only on the amplitude of the measured vibrations, but also on the frequency range and the datalogger's analysis parameters (i.e. - lines of resolution, maximum frequency of interest, types of averaging, number of averages, etc.). Commonwealth Edison has determined that vibration analysis below pump running speed would not provide any additional insight regarding degradation of the slow speed SBLC pumps. Commonwealth Edison has also consulted with technical experts from the Union Pump Company and they concur with this determination. The primary vibration response peaks for a triplex reciprocating pump would be at 1 times and 3 times pump running speed. Peaks would also be expected at 2 times and 6 times running speed due to the natural unbalance of the 3 connecting rods on the crankshaft. Higher frequency responses would be expected at gear mesh and bearing ball pass frequencies, and multiples thereof. In general, rubbing of mechanical components could be indicated at multiples of 1/2 times running speed. However, Union Pump Company stated that it is doubtful that the energy generated by rubs (at the connecting rod bushings or plunger seals) would be sufficient to provide indications at frequencies less than running speed because of the slow speed of the SBLC pumps. There are no other known pump degradation mechanisms that would be detected at frequencies less than running speed for the SBLC pumps. Since these pumps do not have journal bearings, oil whip (which would be indicated at slightly less than 1/2 running speed) is not a consideration.

Dresden Station has one VLF transducer and datalogger. However, additional VLF vibration equipment would have to be procured in case the current components break or require calibration. Additional VLF components would cost approximately $15,000 plus additional costs for calibration. It may be possible to procure a transducer that could be calibrated from 2 to 1000 Hz. However, the use of such a sensor with the Dresden IRD vibration measurement equipment would require the addition of a signal conditioner in the instrument loop; would require a special calibration procedure to be developed, and would unnecessarily complicate the taking of vibration readings. The cost of this alternative would be well in excess of $15,000.

Measurement of SBLC pump vibration with a frequency response range from minimum pump speed to at least 1000 Hz would provide reasonable assurance of operational readiness because no useful indications of degradation would be detected by measurement of vibration at frequencies less than pump running speed. The costs to procure, maintain and calibrate the components needed to comply with the frequency response range requirements of Part 6 would be a burden for the utility without a compensating increase in quality or safety.

PROPOSED ALTERNATIVE

The calibrated frequency response range of the transducers and readout system for vibration measurements of the SBLC pumps will be from minimum pump running speed to at least 1000 Hz.