AUG 1 8 1976

Distribution
Docket
NRC PDR
Local PDR
ORB #3 File
KGoller/TJCarter
CParrish
JShea
OELD
OI&E (3) 5
GLear
DEisenhut
TBAbernathy, DTIE
JRBuchanan
ACRS (16)
DRoss

Docket No. 50-331

Iowa Electric Light & Power Company
ATTN: Mr. Duane Arnold, President
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52406

Gentlemen:

Please provide responses to the enclosed request for additional information within 30 days so that we can continue our evaluation of your June 18, 1976 submittal related to potential RHR (LPCI) pump runout conditions following a postulated LOCA.

Sincerely,

Original signed by

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosure:
Request for Additional
Information

cc: See next page

OFFICE ➤	ORB #3	ORB #3				
SURNAME ➤	JShea JS	GLear G				
DATE ➤	8/18/76	8/18/76				

Form AEC-318 (Rev. 9-53) AECM 0240 ☆ U. S. GOVERNMENT PRINTING OFFICE: 1974-526-166 cc:

Jack R. Newman, Esquire
Harold F. Reis, Esquire
Lowenstein, Newman, Reis and Axelrad
1025 Connecticut Avenue, N. W.
Washington, D. C. 20036

Office for Planning and Programming
523 East 12th Street
Des Moines, Iowa 50319

Mr. Dudley Henderson
Chairman, Linn County
Board of Supervisors
Cedar Rapids, Iowa 52406

Iowa Electric Light & Power Company
ATTN: Mr. G. G. Hunt
Chief Engineer
Duane Arnold Energy Center
Palo, Iowa 52324

Cedar Rapids Public Library
426 Third Avenue, S. E.
Cedar Rapids, Iowa 52401

ADDITIONAL INFORMATION REQUIREMENTS
LPCI PUMP RUNOUT
DUANE ARNOLD

1) What break location was assumed when evaluating the maximum flow possible from a LPCI pump or pumps pumping directly to a break? Describe how the system losses were calculated, including a sketch of the system assumed and a tabulation of the head loss in feet for each component in the system (valves, orifices, heat exchangers, etc.).

2) Describe the NPSH available to the LPCI pump for the worst pump configuration (single failure resulting in highest pump flow) as a function of time, both short-term and long-term, in the event of a postulated loss-of-coolant accident. Suppression pool temperatures versus time should be indicated and the effect of pool temperature should be included in the calculation.

3) Provide a complete description of any tests performed by you or the pump manufacturer to demonstrate that the RHR pumps can operate at less than recommended design NPSH conditions without sustaining damage. The description should include the test procedures, the test points, and data taken at each point, i.e. pump flow, pump suction pressure, pump discharge pressure, vibration, water temperature, etc. Give operating times (estimated if not recorded) over which the pumps operated at less than design NPSH. Include observations concerning pump vibration, noise, and cavitation during the tests.

4) Provide the required NPSH vs time for a postulated LOCA with the worst pump configuration (single failure resulting in highest pump flow) for both short and long-term cooling.

5) Following a LOCA, what indication of RHR pump flows would the operator have in the control room? What indications would the operator have to know that the RHR pumps were cavitating? What action could be taken to alleviate such operation, and how long would such action take?

6) Assuming the most limiting single failure, what is the minimum number of LPCI pumps that may be pumping directly to the break? Be sure to consider diesel failure and valve failures. For this most limiting condition, show that the pump(s) will not sustain significant damage while pumping directly to the break.

7) Define the term "runout" as used in your response.

8) For the DBA-LOCA assuming the single failure which results in maximum LPCI pump flow, provide a plot or table of the pump motor current requirements and horsepower vs. time, and compare these to the motor's recommended limits which you should also supply. Also, calculate the diesel generator load for the generator supplying this current, and compare with the generator's recommended limits.

This detail is needed to evaluate the acceptability of your response C, in your June 18, 1976 letter.

9) Specify the number of pumps assumed to be available in your ECCS Appendix K Long-Term Cooling analysis.