Vice President

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Consolidated Edison Company of New York, Inc.
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August 16, 1971

Dr. Peter A. Morris
Director
Division of Reactor Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Re: Consolidated Edison Company of New York, Inc.
AEC Docket No. 50-247

Dear Dr. Morris

The attachment supplements the document entitled, "Additional Testimony of Applicant Concerning Emergency Core Cooling System Performance", dated July 13, 1971. The attachment responds to questions raised orally by the Division of Reactor Licensing and which were discussed with the staff at a meeting on August 13, 1971.

Items 1 and 2 provide additional details on the reflooding analysis and an analysis of the 0.5 square foot cold leg break. Items 3 and 4 provide clarifying information which demonstrates that the analysis in the above-mentioned document is in accordance with Appendix A, Part 3, of the Commission's interim policy statement. There is also included in the attachment a replacement for Figure 27 to correct a typographical error in identifying the broken hot leg curve.

Sincerely yours

William J. Cahill, Jr.

William J. Cahill, Jr.
Vice President

Attachment:
"Additional Information on Emergency Core Cooling Analysis", 8/16/71

ADDITIONAL INFORMATION ON EMERGENCY CORE COOLING ANALYSIS

This information should be added to the discussion entitled, "Results" appearing on Page 18 of the document entitled, "Additional Testimony of Applicant Concerning Emergency Core Cooling System Performance", dated July 13, 1971.

1. Details of the Reflooding Analysis

   Figure 1 is a plot of both the core flooding rate and the hot spot film heat transfer coefficient as a function of time used in the double-ended cold leg break Loss of Coolant Analysis. The time that the accumulators empty is also indicated on the graph.

2. 0.5 Square Foot Cold Leg Break

   An analysis has been performed for the 0.5 ft^2 cold leg break using the interim criteria. The peak clad temperature was 2185°F. This is greater than the peak clad temperature calculated for the 3.0 ft^2 cold leg break, which is not surprising because a decrease in break size increased the amount of the accumulator water than can be injected before the end of blowdown. In fact, for these smaller breaks the clad temperature rise is stabilized before the end of blowdown, but on the other hand, these smaller breaks define the lower limit of the break size for which accumulator water loss need be considered because of the limit on the maximum amount of water that can be passed through the break and the much lower steam velocities in the system.

Figures 2 through 8 provide details of the 0.5 ft^2 cold leg break transient analysis.

3. <u>Hot Leg Break Loss of Coolant Analysis</u>

The hot leg break analysis was previously performed and presented in the Indian Point Unit No. 2 FSAR, Supplement 12, July 1970, and indicated the following:

a. There is no flow reversal during hot leg break blowdown; the flow just decays smoothly, providing good heat transfer in the core.

b. In a cold leg break analysis, the accumulator and low head injection flow for the broken loop is assumed to spill to the containment. This assumption is not valid for a hot leg break; thus, there is more accumulator water mass and more low head injection flow available for cooling.

c. During the reflood phase of the accident there is no problem with steam binding since the steam generated in the core is vented directly to the containment via the broken hot leg. In addition, there is more accumulator water available, heat transfer during reflood for the hot leg break will be better than for the cold leg break. The peak clad temperature will be less than 2000°F.

4. <u>0.6 DE Cold Leg Break</u>

Sensitivity to break mode for various break sizes has been studied in the past. Results showed that for the double-ended break, the temperature for the guillotine type was approximately 100°F greater than for the split type. For lesser break areas, as seen in results for the 0.8 double-ended break, the split type had a higher temperature than the guillotine. If the 0.6 double-ended area break (which is 4.9 ft^2) were analyzed, the split type would yield a higher peak clad temperature. Instead of analyzing the 0.6 double-ended area break, the 4.5 ft^2 area split type break was used and results were reported. The following table indicates the break mode for each break size.

Break Size	Mode
Double-ended	Guillotine
0.8 Double-ended	Split
4.5 ft^2	Split
3.0 ft^2	Split
0.5 ft^2	Split

FIGURE 1

DOUBLE ENDED COLD LEG BREAK REFLOODING PARAMETERS

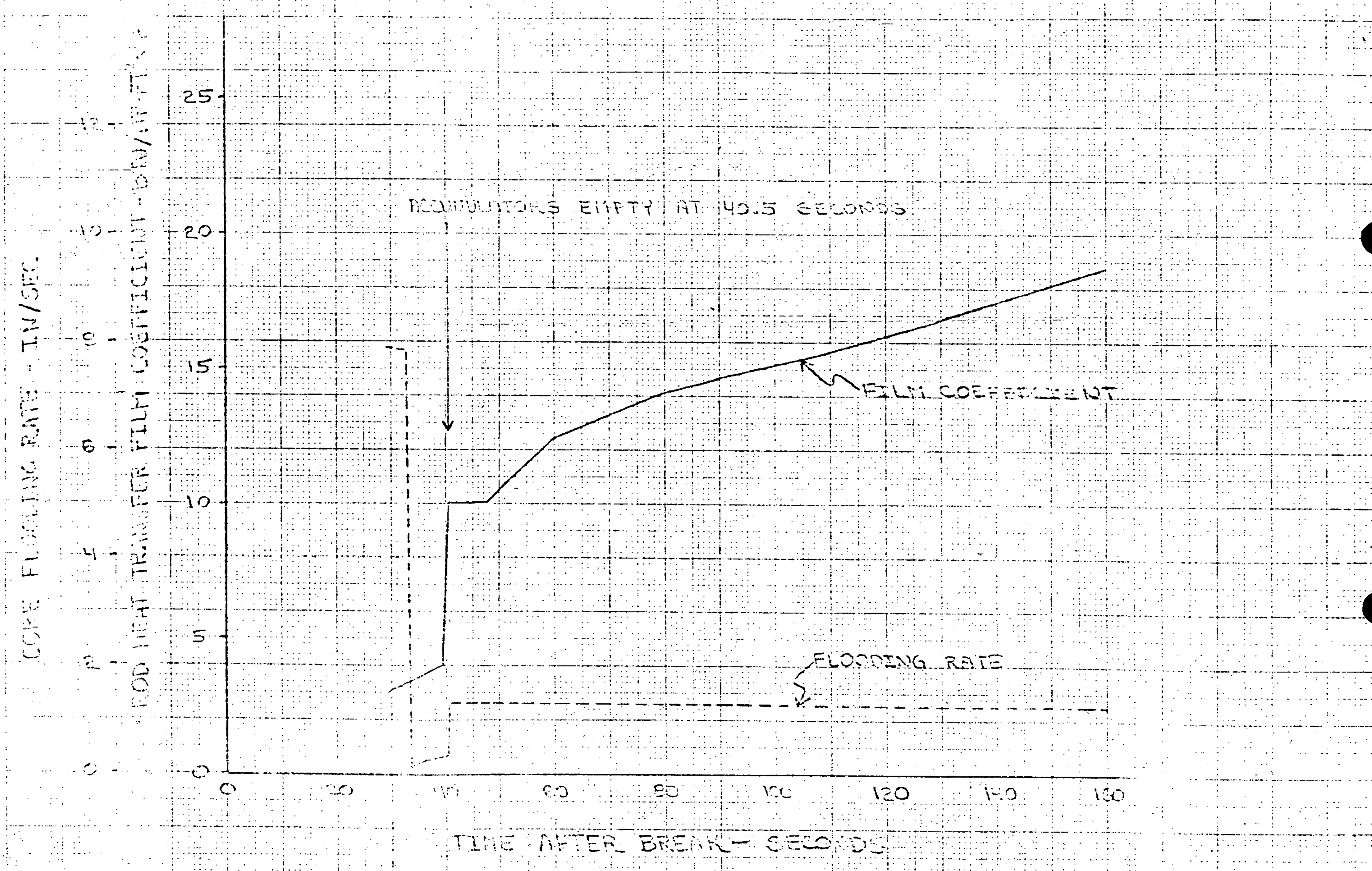
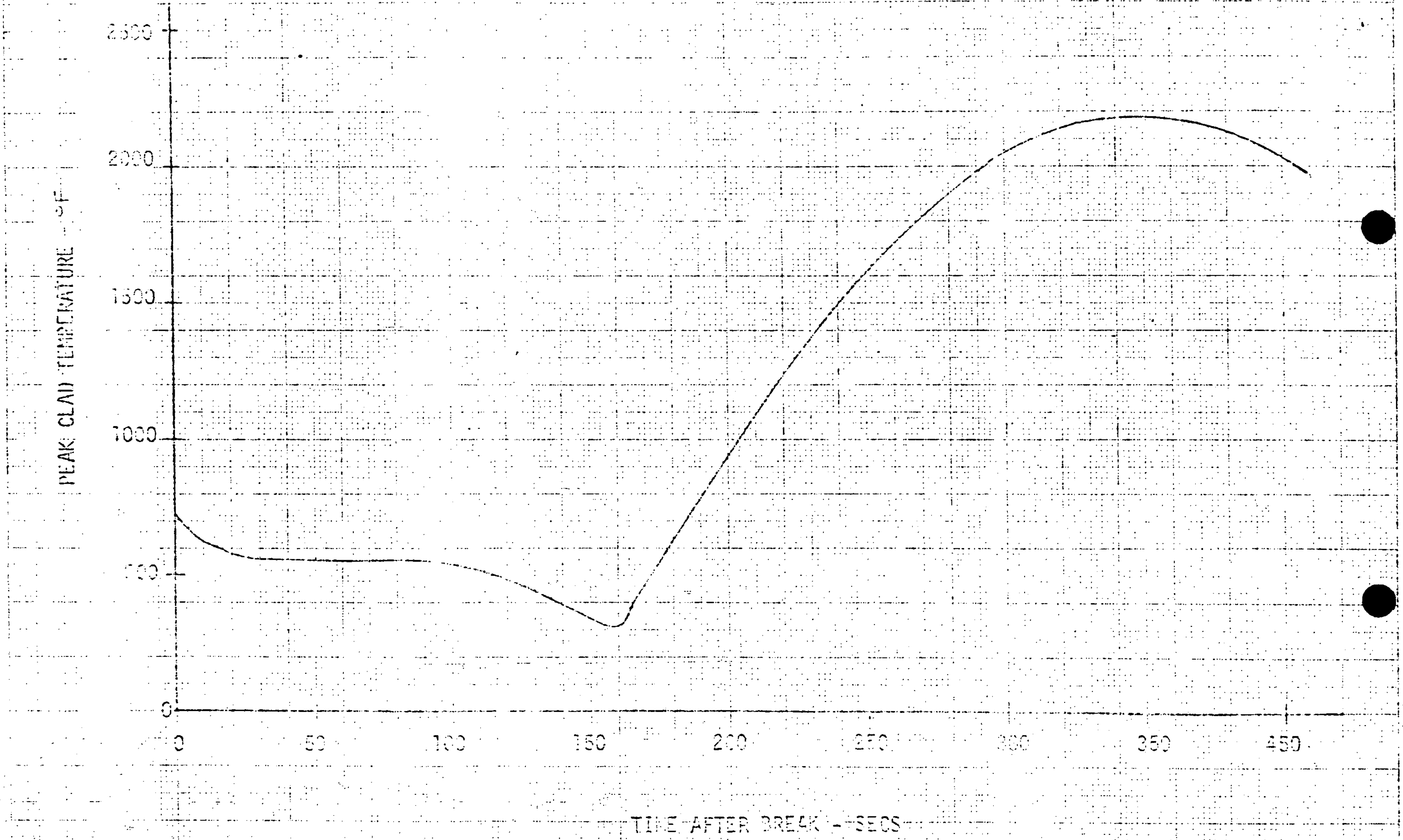
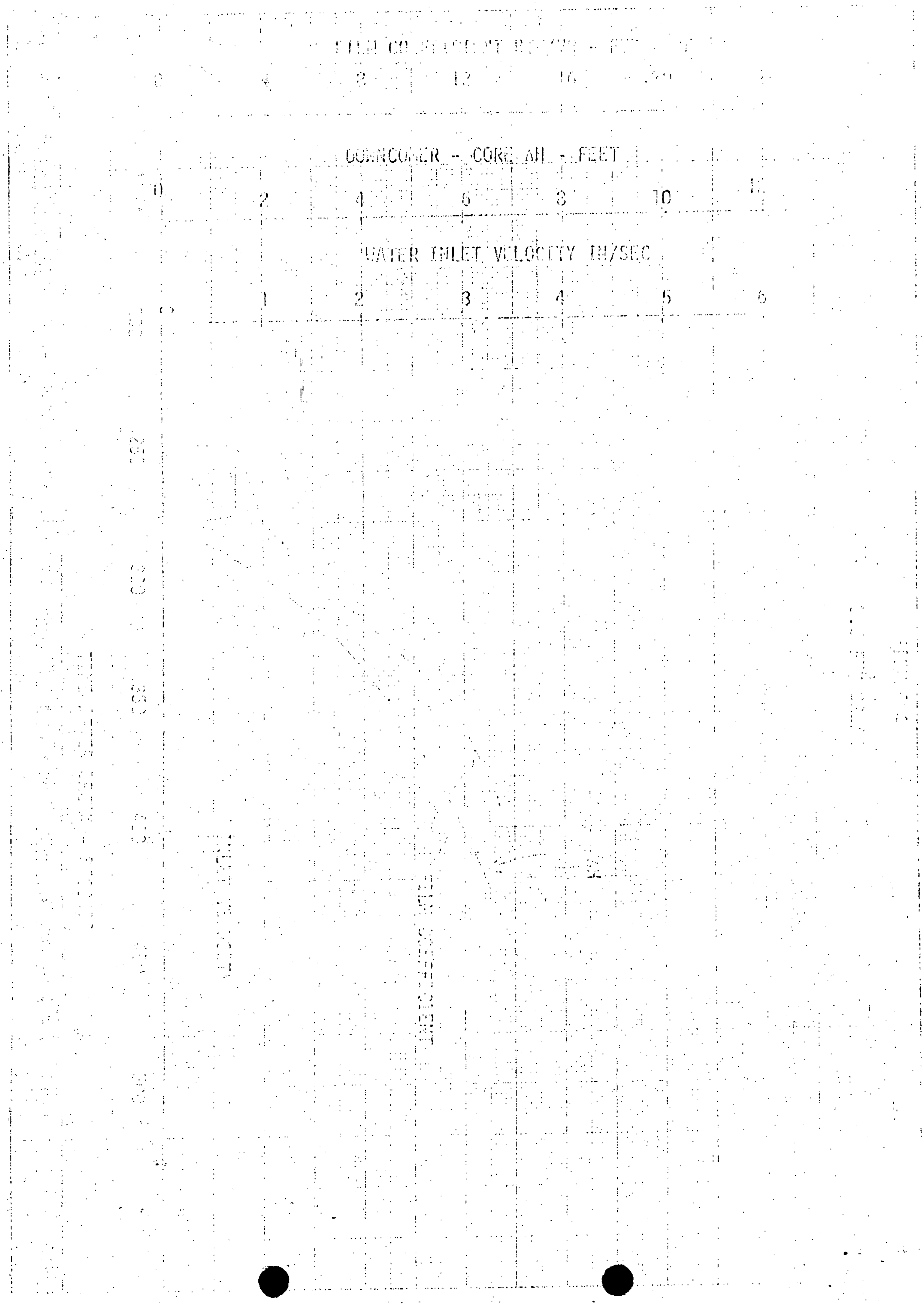


FIGURE 2

0.5 FT² BREAK





0 4 8 12 16
DOWNCOMER - CORE ΔH - FEET
0 2 4 6 8 10
WATER INLET VELOCITY IN/SEC
1 2 3 4 5 6

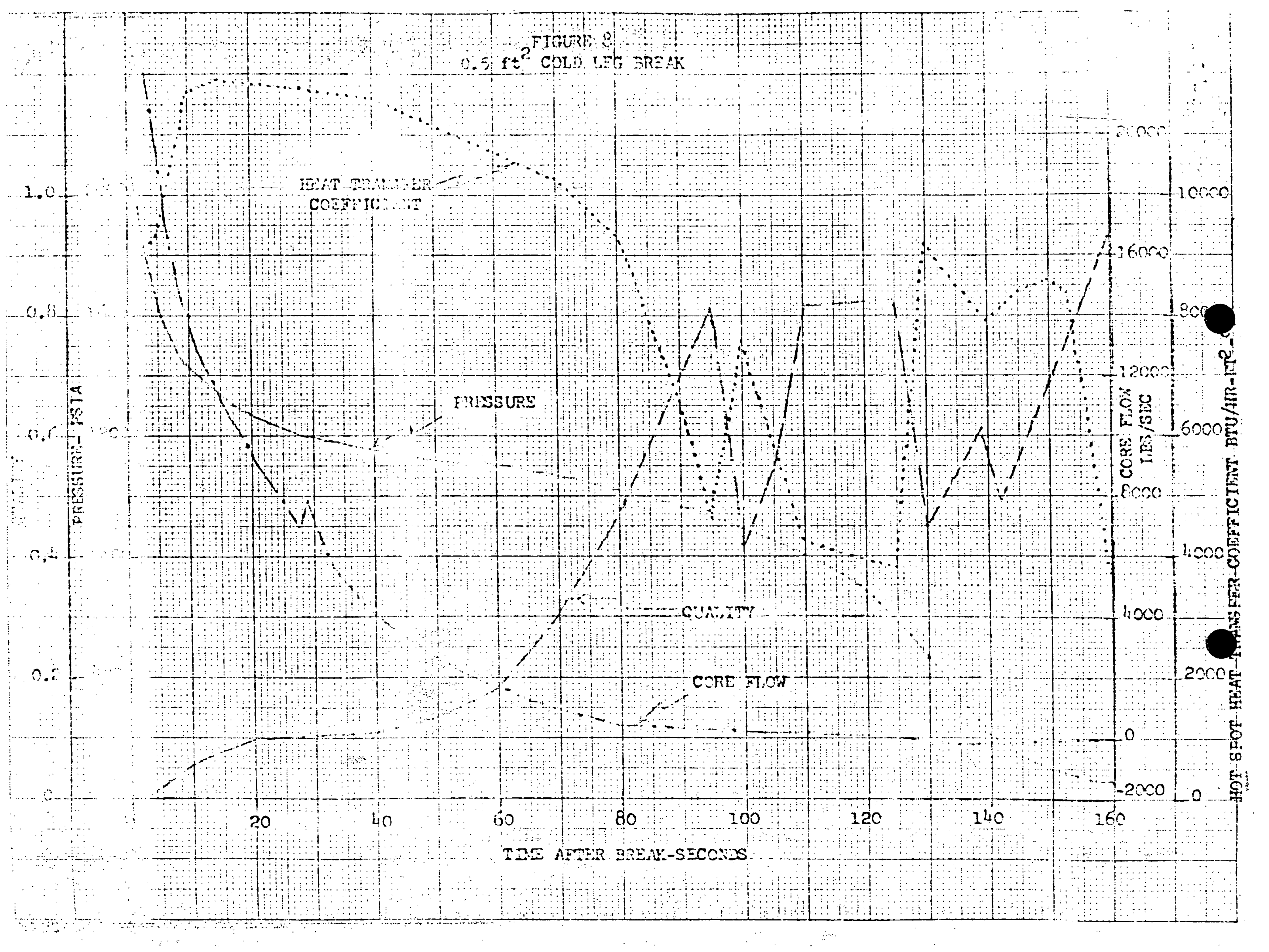


FIGURE 8
0.5 ft² COLD LEG BREAK

FIGURE 27
.8 DE Break