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RECIP.NAME RECIPIENT AFFILIATION
CRUTCHFIELD,D. Operating Reactors Branch 5

SUBJECT: Describes leak rate calculation in response to NRC request for addl info re eddy current insp results & summary of leak rate calculations,per 840323 request for approval to install no more than 10 addl tubesheet sleeves.

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ROGER W. KOBER
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April 23, 1984

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Steam Generator Tubesheet Sleeves
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

By letter dated March 23, 1984 Rochester Gas and Electric requested approval to install no more than ten (10) additional tubesheet sleeves. In a subsequent telephone conversation with George Dick, Herb Conrad and Cy Cheng, RG&E committed to sending the Nuclear Regulatory Commission additional information regarding eddy current inspection results and a summary of leak rate calculations. Eddy current inspection results were sent by letter dated March 30, 1984. The leak rate calculation is described below.

The following conditions were assumed for the leak rate calculations:

- Primary side pressure is 2500 PSIA and secondary side pressure is 15 PSIA. The condition is associated with a main steam line break situation.
- Primary side water temperature is 600°F.
- Non-equilibrium conditions are assumed to exist due to the short leakage path and high velocities. No flashing of fluid to steam is assumed until downstream of the leakage path.
- The tube is assumed to be severed 360° circumferentially and pressure loadings are calculated to cause the tube to pull apart 0.2 inches.

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Based on these assumptions, the expected leakage flow was calculated for break elevations from 0.4 inches to 7.0 inches below the secondary side of the tubesheet for both maximum and minimum annular gaps between the tube and tubesheet. These curves are given on Figure 2. It should be noted that the leakage rate would drop dramatically if the break elevation exceeds 1.75 inches from the secondary face of the tubesheet. This is because the flow path then involves two annuli; sleeve/tube and tube/ tubesheet.

The area of the tube with mimimum inspectability extends from the top of the sleeve to approximately 0.75 inches above the top of the sleeve. At this point, as detailed in our letter of March 23, 1984, a defect can be detected but not sized. Because of this, a leak is postulated at this point as shown on Figure 1. Assuming 0.2 inches of pullout due to pressure loading on the tube, the leakage path is 0.8 inches. As shown on Figure 2 the resultant maximum leakage flow rate can then be determined as 23 GPM. This leakage value is conservative considering the assumption of non-equilibrium conditions. The actual leakage value would be expected to be lower.

Very truly yours,

Roger W. Kober

Roger W. Kober

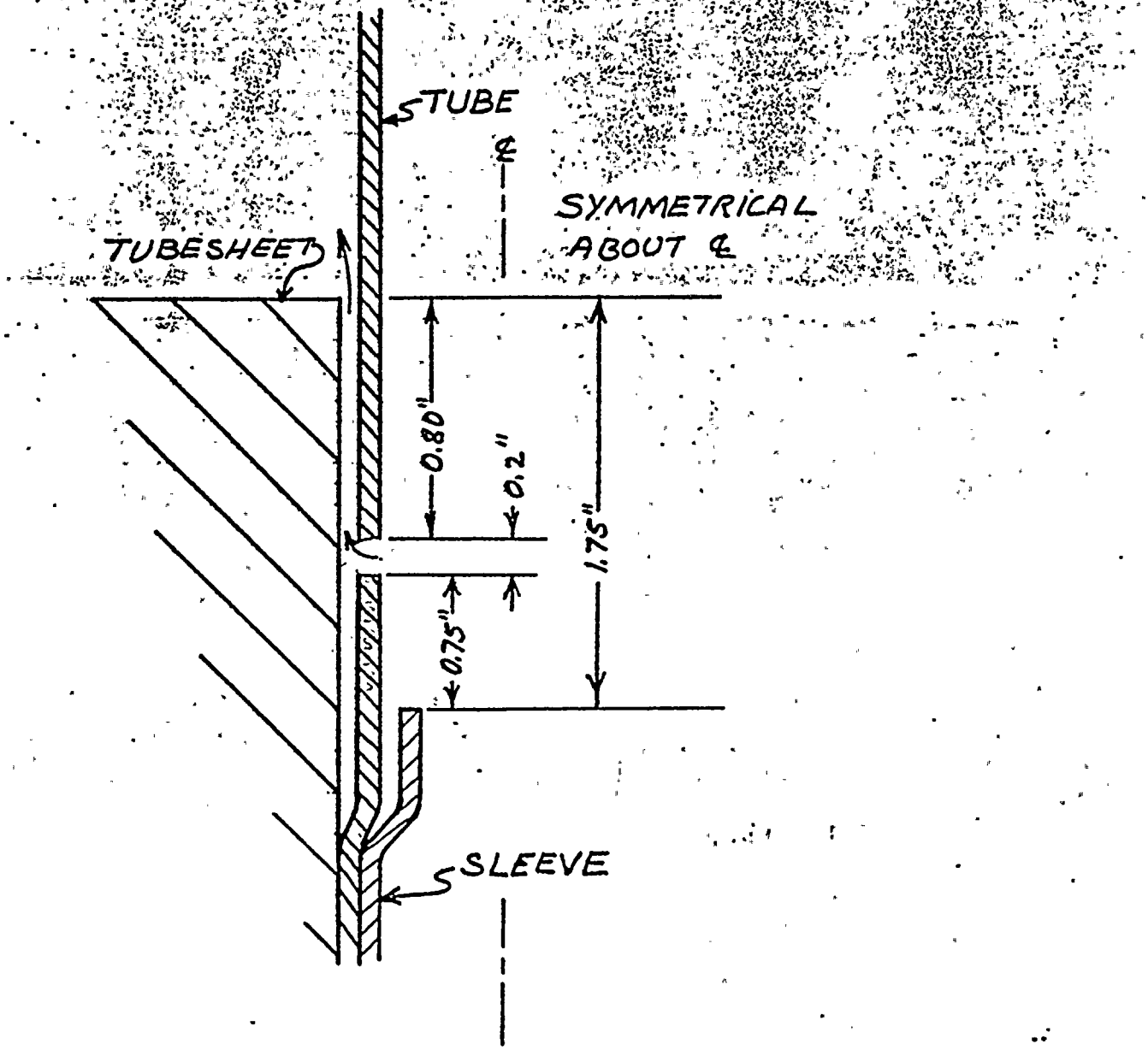
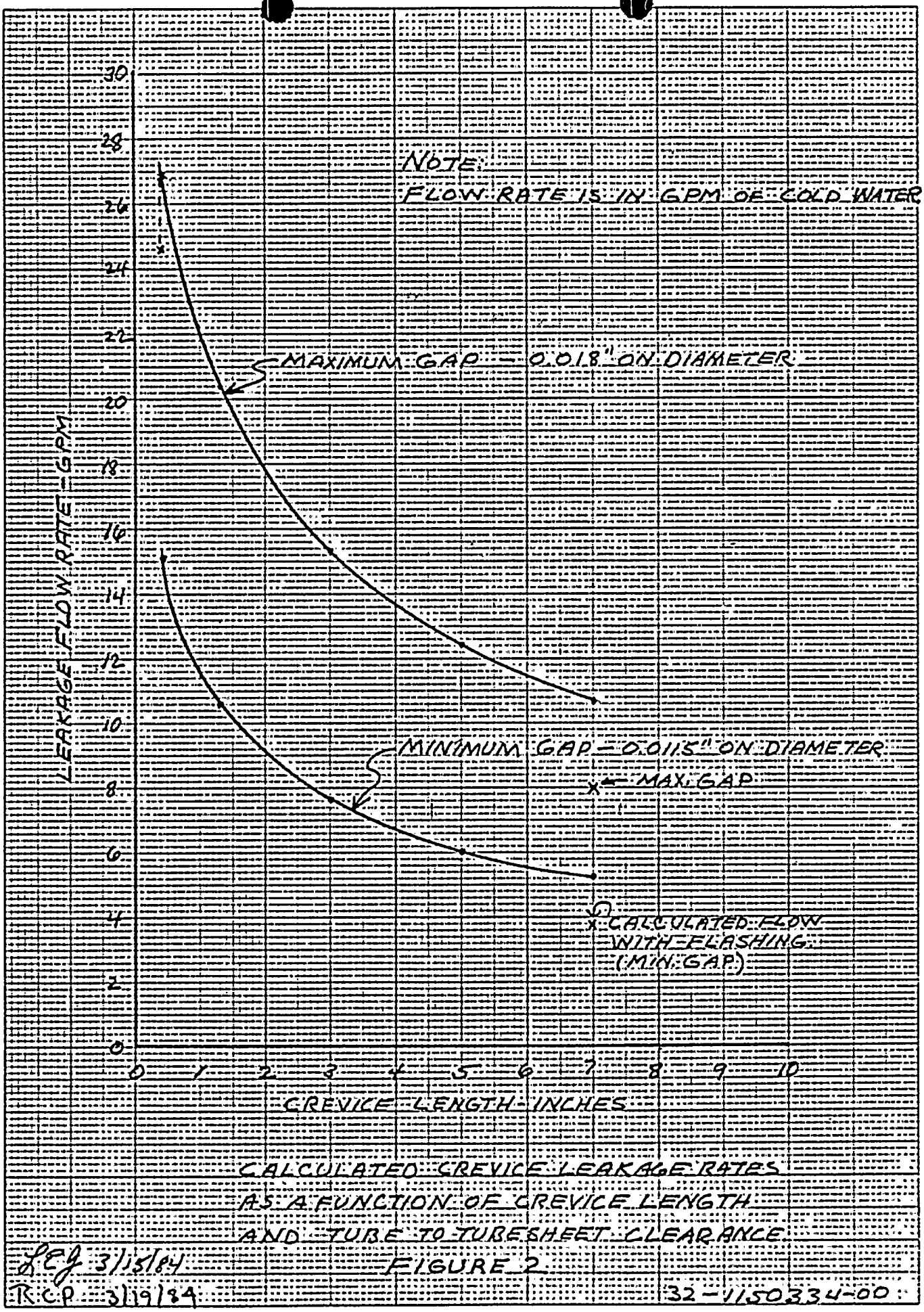


FIGURE 1



CALCULATED CREVICE LEAKAGE RATES
AS A FUNCTION OF CREVICE LENGTH
AND TUBE TO TUBESHEET CLEARANCE

LCJ 3/15/84 — FIGURE 2.

RCP 3/19/84 — 32-1150334-00

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