TU ELECTRIC

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William J. Cahill, Jr.
Group Vice President

August 7, 1992

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES) - UNIT 2
DOCKET NO. 50-446
PRESSURIZER SURGE LINE LEAK-BEFORE-BREAK ANALYSIS

REF: NRC letter dated July 10, 1992, to William J. Cahill, Jr., "Request for Additional Information - Comanche Peak Steam Electric Station Unit 2, Pressurizer Surge Line Leak-Before-Break Analysis (TAC No. M82947)"

Gentlemen:

In response to your request for additional information referenced above, we are providing responses to your request in Attachment 1. To assure clarity, each request is repeated and then responded to in the attachment.

If there are any questions, please call Mr. Chris E. Jensen at (214) 812-8826.

Sincerely,

William J. Cahill, Jr.

By: D R Woodlan
D. R. Woodlan
Docket Licensing Manager

CEJ/tg
Attachment

c - Mr. J. L. Milhoan, Region IV
Mr. B. E. Holian, NRR
Resident Inspectors, CPSES (2)

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RESPONSES TO NRC "REQUEST FOR ADDITIONAL INFORMATION - CPSES, UNIT 2, PRESSURIZER SURGE LINE LEAK-BEFORE-BREAK ANALYSIS," NRC LETTER OF JULY 10, 1992

1. Determination of Leakage Flaw Size

Request:

Supply a copy of actual data input to the computer program and the corresponding computer output for limit load analysis and leakage flaw size calculation for Case B/G of Table 7-1.

Response:

Leakage flaw size, as reported in Table 5-1 and subsequently carried over to Table 7-1, is determined from "Leak Rate vs. Crack Length" graphs. A graph is developed for the governing location (node 1020) for each of the three normal, stratification, and heat-up/cool-down load cases, which are defined in Table 4-2 of WCAP-13100, and labeled as Load Cases A, B, and C.

The graphs used to determine crack length in Table 5-1 for Load Cases A, B, and C are attached as Figures 1, 2 and 3, respectively. As can be seen from the graphs, a leak rate of 10 GPM is conservatively selected from which the applicable crack length is determined. The crack lengths found which would produce a 10 GPM leak rate are 4.52 inches for Case A, 3.70 inches for Case B, and 2.50 inches for Case C.

Critical flaw size, as reported in Table 5-2 and subsequently carried over to Table 7-1, is determined from Limit Moment tables which are included in the WCAP as Figures 5-6, 5-7, 5-8 and 5-9. The critical flaw size is extracted from these tables, and decreases as the limit moment increases.

The margins as reported in Table 7-1 are the quotients of critical flaw size (for Load Cases A, B or C) divided by leakage flaw size (for Load Cases D, E, F or G), as appropriate. For Case B/G, this margin is calculated as 7.27 divided by 3.70, which equals 1.965 $\approx$ 2.0. Appropriate conservatisms are included in the calculations to assure an acceptable factor of safety exists (see Table 7-2 of WCAP-13100).

2. Determination of Governing Locations

Request:

Provide a table similar to Table 4-4, which shows the worst stress of all shielded metal arc weld locations along the line for each load case (Cases A through G).

Response:

The Comanche Peak Unit 2 pressurizer surge line contains only one (1) shielded metal arc weld (SMAW). This location is the shop weld located at node point 1100. All remaining welds are gas-tungsten arc weids at the field weld locations (refer to Figure 3-1 of WCAP-13100).

For the SMAW at node part 1100, a table similar to Table 4-4 has been developed, and is included herein as Table 1. Note that although axial force and axial stress are slightly higher at node 1100, moment and bending stress are considerably lower, and hence total stress is lower. Correction of calculated loads in Table 1 by the applicable Z-factor still leads to the conclusion that node 1020 is, overall, the governing location.

TABLE 1

REVIEW OF WCAP-13100

TABLE SIMILAR TO TABLE 4-4 FOR THE GOVERNING SMAW

NODE	CASE	AXIAL FORCE F(lb)	MOMENT M(in-lb)	AXIAL STRESS σ_a(psi)	BENDING STRESS σ_b(psi)	TOTAL STRESS σ_t(psi)
1100	A	227,267	870,436	4,085	5,457	9,542
1100	B	227,754	940,972	4,094	5,899	9,993
1100	C	49,717	1,805,347	894	11,318	12,212
1100	D	248,637	1,756,909	4,470	11,014	15,484
1100	E	249,124	1,8[illegible],223	4,479	11,410	15,889
1100	F	48,774	1,447,381	879	9,074	9,953
1100	G	71,087	2,527,457	1,278	15,844	17,122

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ATTACHMENT 1
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FIGURE 1

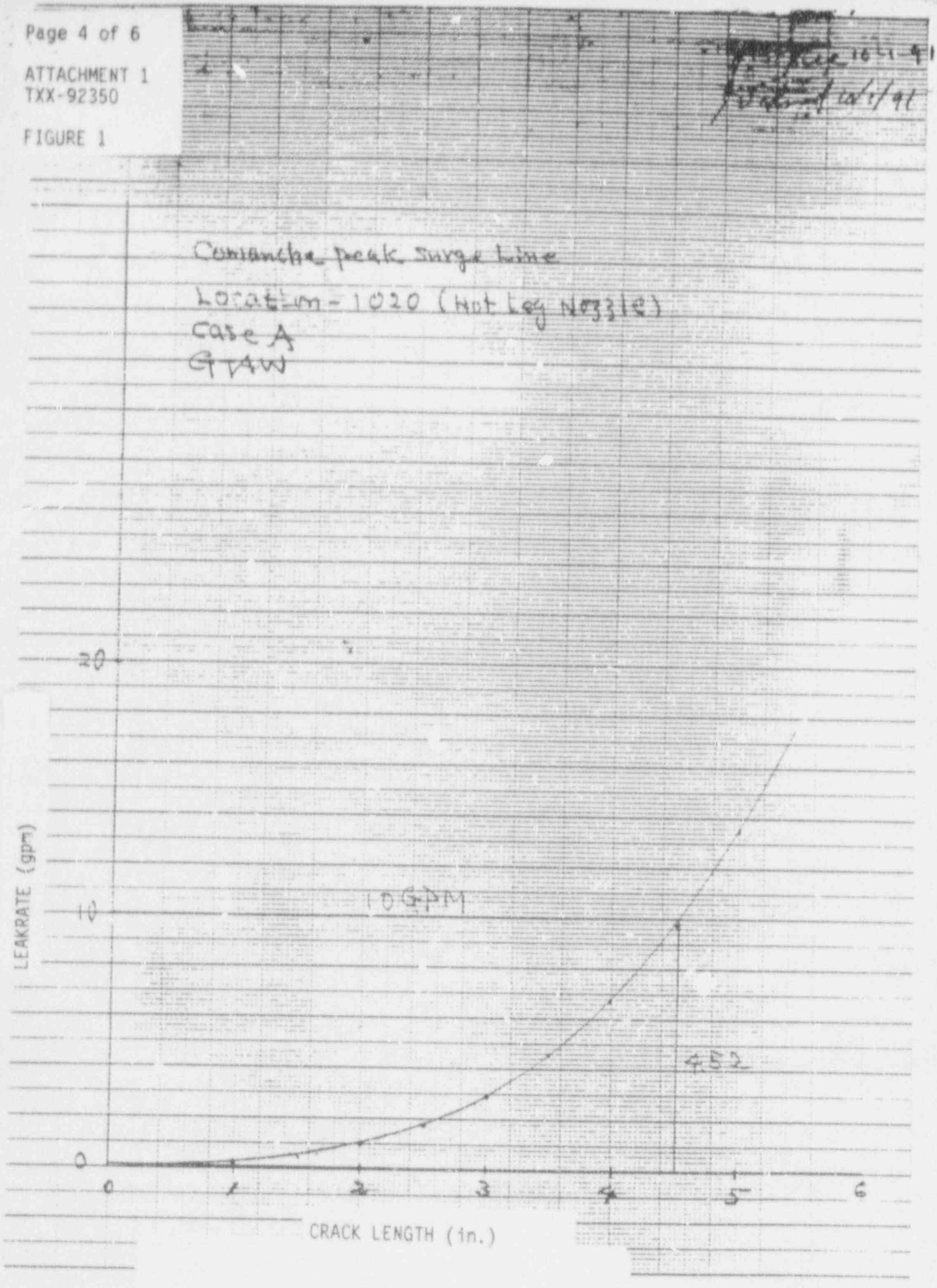

FIGURE 1

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FIGURE 2

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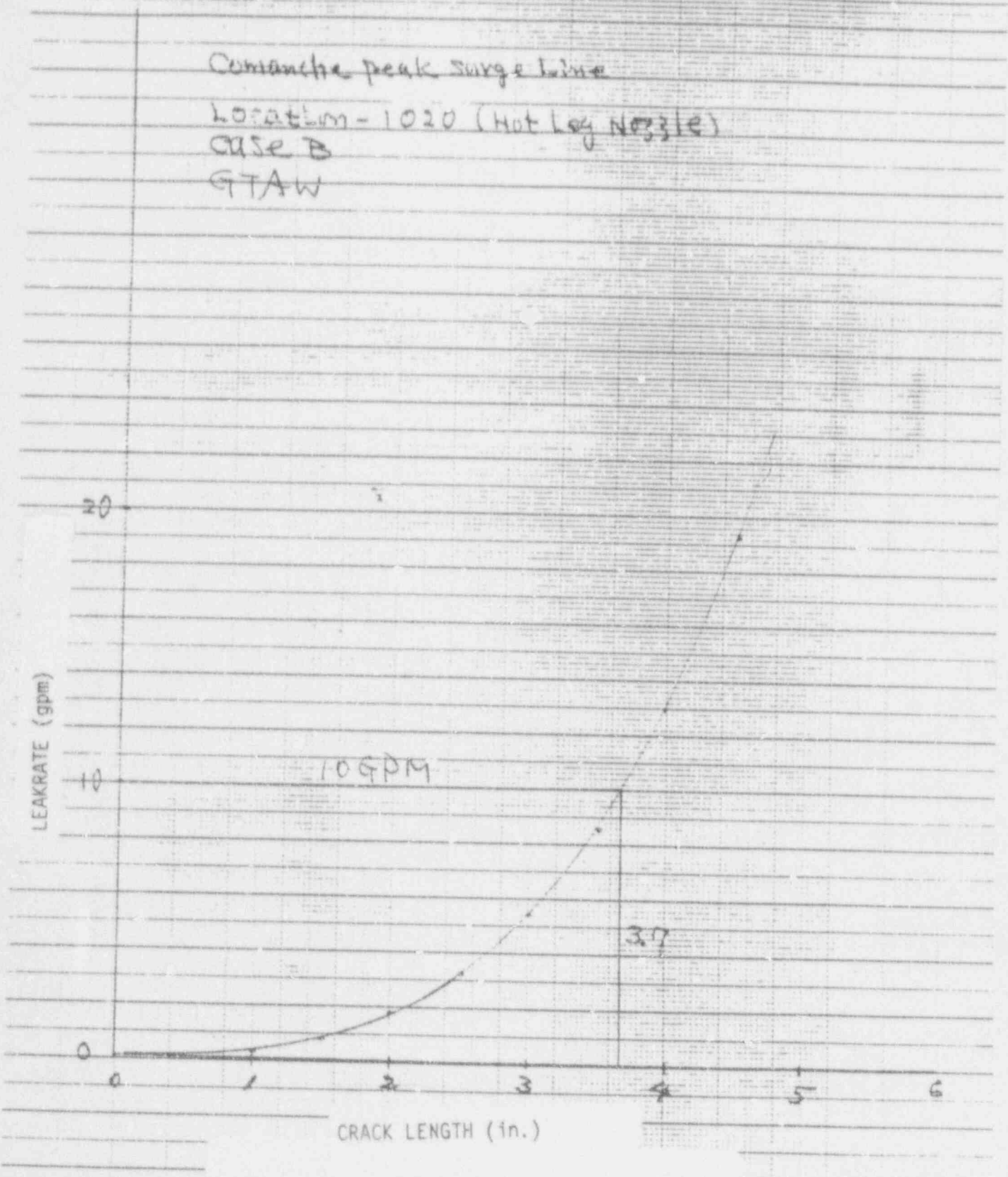

FIGURE 2

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FIGURE 3

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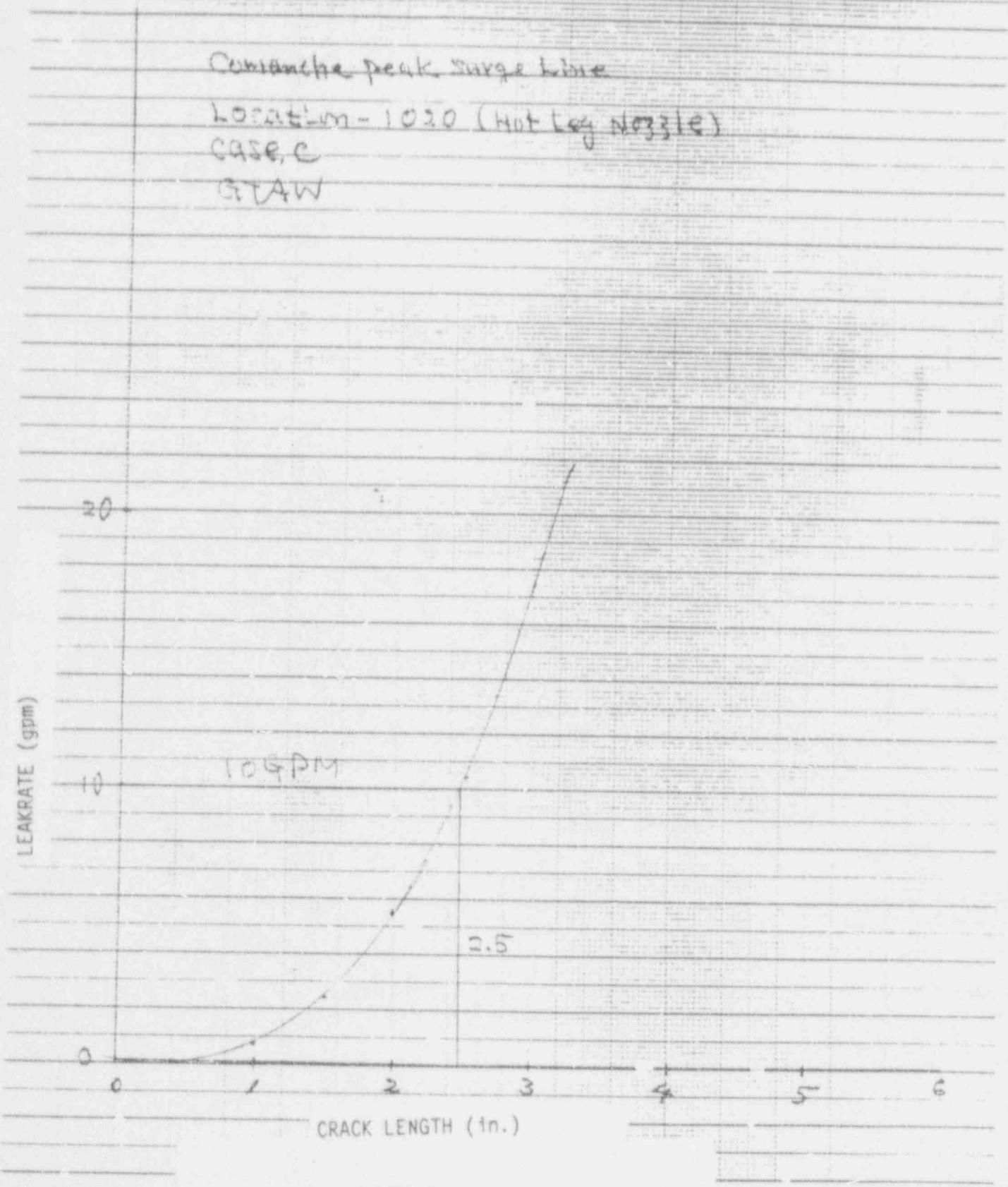

FIGURE 3