December 17, 1979

Note to: George Frampton

From: Bob Bernero

In response to your questions, I offer the following:

Question 1 - When did Region I learn hot leg temperatures above saturation?

Answer - The first clear record that Region I knew of superheated steam conditions was Gallina's report at 2:55 p.m. (IMF-C-17) where it was reported that:

$$P = 450 \text{ psig}$$

$$T_h = 550$$

which means there were 90-100 degrees F of superheat.

Question 2 - When did Bethesda learn of hot leg temperatures above saturation?

Answer - At 12:34 p.m. the HQ Field Communicator recorded:

$$P = 1100 \text{ psi}$$

$$T_h = 560^{\circ}F$$

$$T_c = 560^{\circ}F$$

which would be about $3^{\circ}F$ of superheat. A reasonable man would call these saturation conditions, not superheat.

At 2:15 p.m. the HQ Field Communicator recorded:

$$P = 500 \text{ psi}$$

$$T_h = 600^{\circ}F$$

which would be about $125^{\circ}F$ of superheat.

Question 3 - When did NRC learn about supersaturation conditions?

Answer - Supersaturation means superheat.

(cont'd)

Question 4 - Is it true that there is no way to get temperatures above the saturation point without the core being uncovered?

Answer - Yes, the core is the only heat source in the RCS. It is therefore the heat source to boil the water and the heat source to further heat the steam produced. Substantial superheat means a substantial length of fuel in the top of the core is covered only by steam.

Bob Bernero

cc: R. DeYoung
R. Haynes
W. Ballaine

OFFICE ▶						
SURNAME ▶						
DATE ▶						