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INTERIM REPORT

Monthly Highlights

for

June 1979*

Light Water Reactor Thermal Hydraulic Development Division

Budget Activity 60-19-10-01

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*Work carried out under the auspices of the United States Nuclear Regulatory Commission.

1.1 Analytical Modeling (B.J.C. Wu and N. Abuaf)

Evaluation of our experimental data using the computer program developed recently continued. Typical values of the net vapor generation rate Γ_v are shown in Fig. 1c. In addition, the measured pressure and void distributions and least squares fits are also displayed (Figs. 1a, 1b).

The modeling of the isentropic homogeneous expansion in the nozzle was also pursued. Since this modeling can not predict any nonequilibrium in the flow, a second approach consisting of a three step process is being tried. In this approach, first the liquid is assumed to go through an isentropic flow in the converging section down to the nozzle throat; second, the shock jump conditions are applied at the throat; and third, the two phase mixture is assumed to follow an isentropic expansion in the diverging section.

From the TRAC calculations performed, the local vapor generation rates, Γ_v, were also calculated and are being compared to the results obtained from the computer calculations of the experimental data.

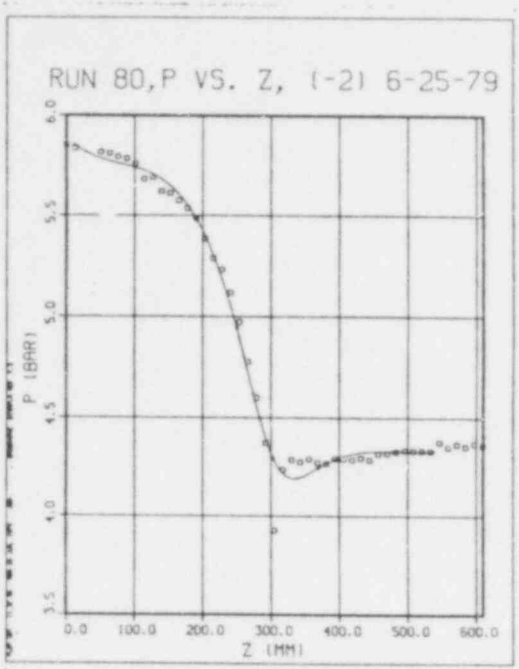
1.2 Flashing Experiments (N. Abuaf, B.J.C. Wu,, G. A. Zimmer, and J. H. Klein)

The electronic parts of the five beam gamma densitometer are debugged and ready for operation.

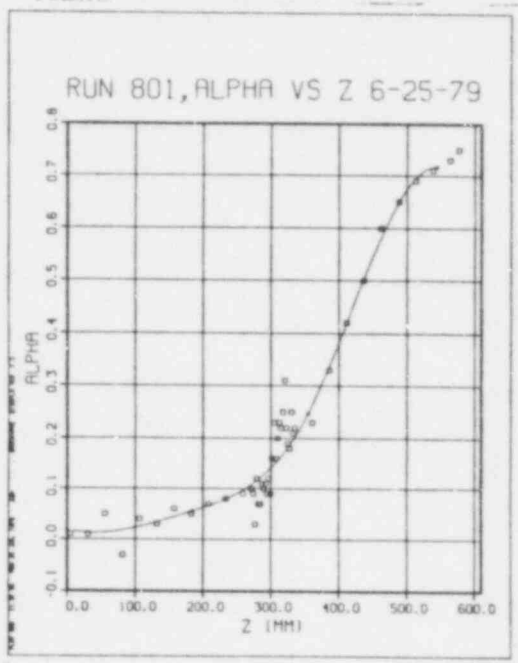
Four of the Thulium ^{170} sources purchased from Amersham Incorporated were irradiated at the HFBR at BNL for a five day period. This activation would push the total activity of each source to the level of curies.

Part of this month was spent in preparation of the facilities for the Brookhaven Laboratory's free weekend tours which are open to the general public. The tour of Reactor Safety Programs experimental facilities took place on June 30 and July 1, 1979. Approximately 450 people visited the

facilities during the two days. The visitors were given a description of the BNL Reactor Safety activities and how the information derived from the program assists NRC in their reactor licensing decisions.



(a)



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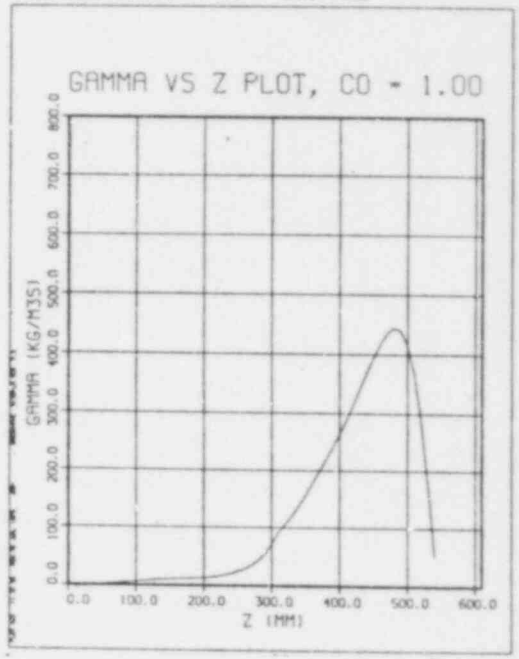

(c)

Figure 1 - Results of Vapor Generation Rate Calculation on Runs 80/801. (a) Measured Pressure (Squares) and Curve Fit (b) Measured Void Fraction (Squares) and Curve Fit (c) Vapor Generation Rate Γ_v.

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