We obtain

$$\Delta k = 100 \times 1.32 \times 1.32 \times .83 \times \frac{29.7}{1987} = 2.2\% \text{ per cell}$$

and

$$\frac{\Delta k}{\Delta ih} = \frac{2.2}{4.5} = 0.49\% \text{ per inhour.}$$

Testing Procedure

The procedure for the testing of billet samples has now been sufficiently standardized to merit a brief description.

The metal testing stringer consists of two sections, each section being a complete stringer for the pile. This affords two advantages; first, when making the change between tests the pile intensity remains constant, and second, while the billet samples in one section are being tested, the other section can be loaded with the next Lot. The double length stringer is moved back and forth by means of 1/8" steel cable which runs through the pile, is attached to wooden blocks at each end of the stringer, and is wound on hand operated winches at each end of the platform outside the pile.

The critical position of the control rod is determined by the galvanometer drift method. The pile is operated at an intensity of about 5 watts, corresponding to a galvanometer reading of 200 divs. If the control rod is .1 inhour off the critical position, the pile has a period

$$\tau = 600 \text{ mins.}$$

and the galvanometer will drift

$$(R-R_o) = R_o\,(e^{t/600}-1) \text{ division in}$$

a time t. The drift is measured for three minutes, therefore,

$$(R-R_o) = 200\,(e^{3/600}-1)$$

$$\cong 200\left[1 + \frac{1}{200} - 1\right] = 1 \text{ div.}$$

This corresponds to a drift of 25 divs. on the differential galvanometer which is operated at full sensitivity. Thus a drift measurement of this sort is sufficient to determine the critical position to an accuracy of about .02 inhours, corresponding to approximately 0.4 mm.

The drifts corresponding to two control rod positions are determined for each Lot tested. A complete test, that is from the beginning of one to the beginning of the next, takes 8 to 9 minutes. Since every fourth test is made on the standard Lot, this means that about 5 or 6 Lots of unknown quality can be tested per hour.

In the past month a total of 89 Lots have been tested.