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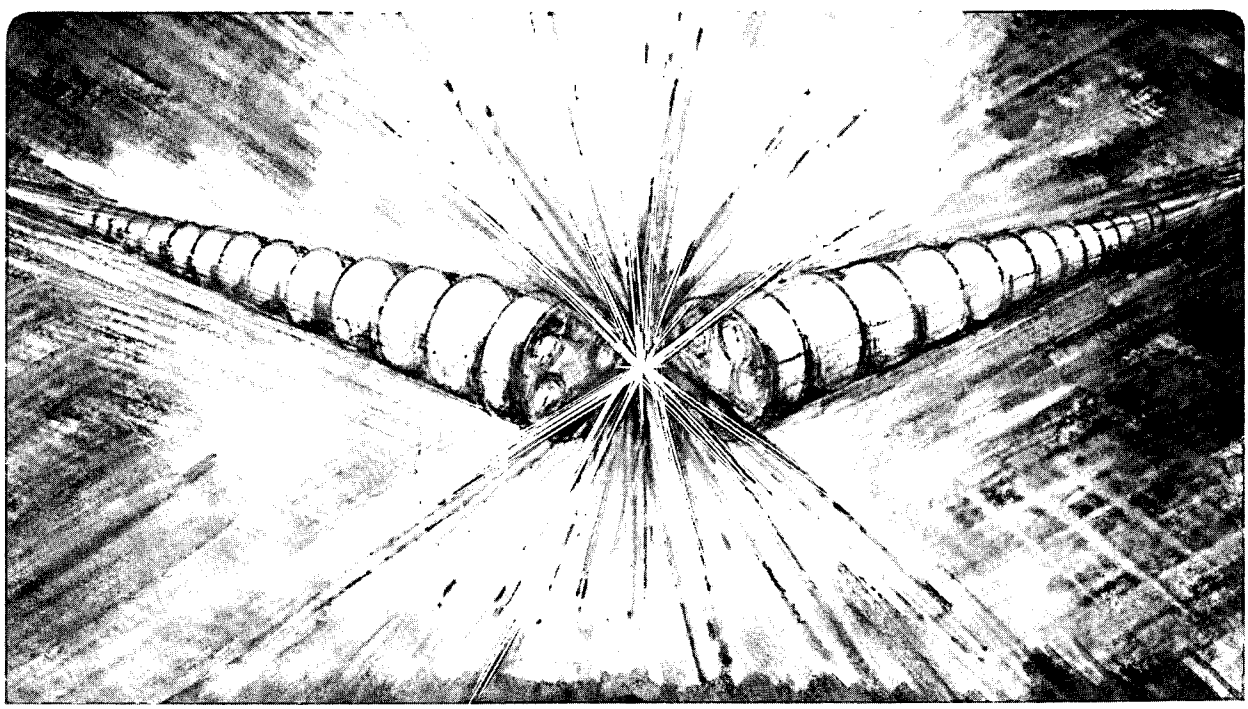

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PEP TECHNICAL MEMO

PTM - 212
LBID- 141

AUTHOR: Richard Sah | DATE: 10-30-79 | REPLACES PTM #

TITLE: Settling of the PEP Accelerator Housing

During the past few months the PEP liquid level system has been completed. It now runs continuously around the PEP accelerator housing except for a single gap at Region 6. During the last two weeks of October, 1979, all the liquid level readouts have been re-calibrated. Since some readouts were previously calibrated when they were installed months ago, the two sets of data can be compared in order to check for the settling of the accelerator housing. Liquid level readout numbers 224, 225 and 226 (located in a tunneled portion of Region 3) were used as reference elevations. The liquid level was installed only recently in Regions 9 and 11, so no data concerning settlement are available for these regions. However, since Regions 9 and 11 were tunneled, little settling is expected.

The enclosed plot shows the vertical distance the accelerator housing has settled (or risen) since the liquid level was first installed and calibrated. These elevation changes are plotted against liquid level readout number, since the readouts are placed at fairly regular intervals (about 22 meters apart) all around PEP. Although the liquid level readouts can easily resolve ± 0.01 mm in elevation, systematic errors reduce the accuracy of the liquid level to about ± 0.10 mm over horizontal distances on the order of a kilometer.

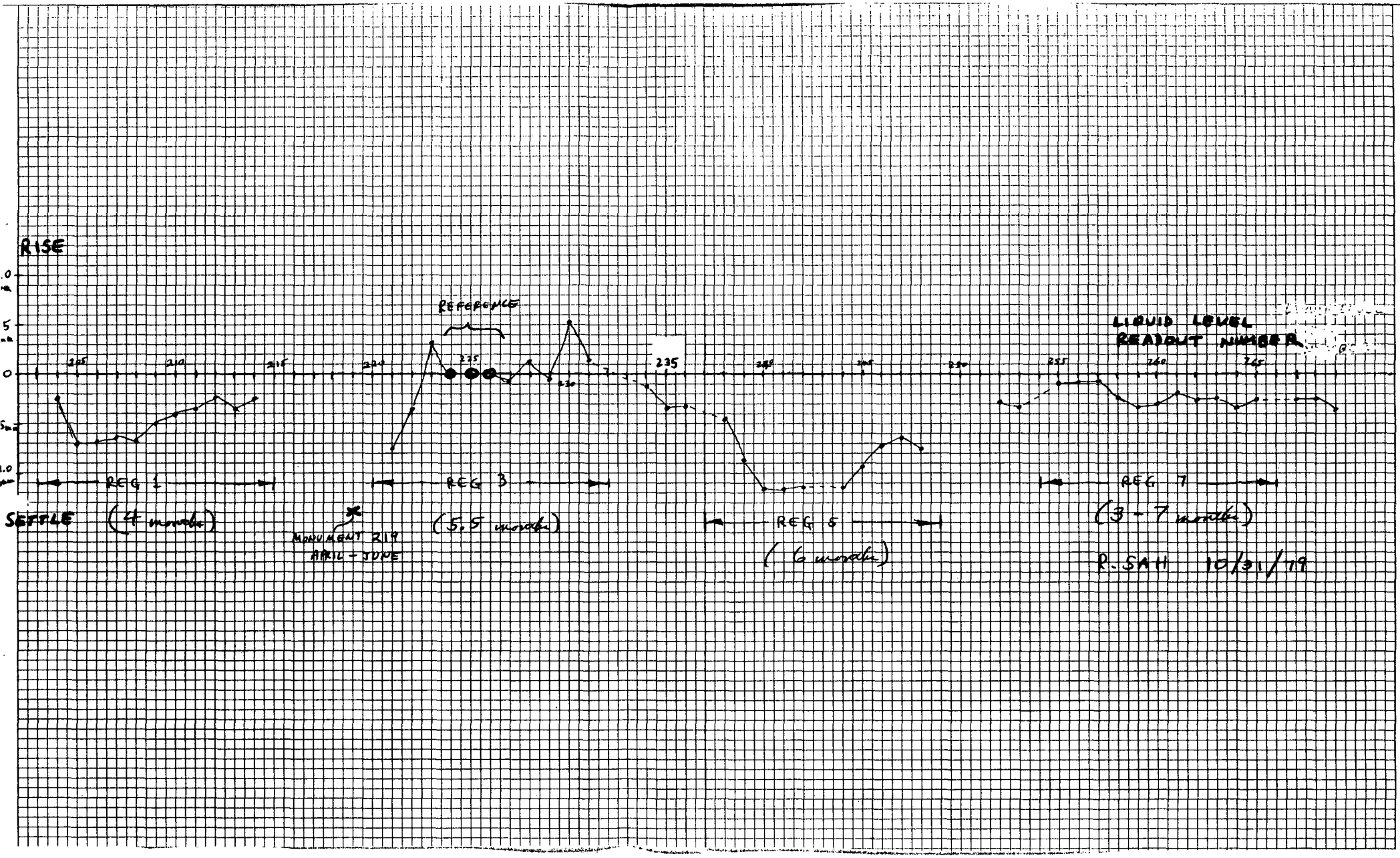
The results of this analysis are quite easy to interpret. First of all, the tunneled part of Region 3 shows no apparent settling, and the choice of readouts 224, 225 and 226 for reference elevations appears reasonable. Of course, the liquid level can be used only to measure relative elevations, so it is possible that Region 3 did settle, but did so less than the other regions.

Region	Settling	Time Interval
1	0.5 mm	4 months
3	0.0 mm (defined)	5.5 months
5	1.0 mm	6 months
7	0.3 mm	3-7 months
9	No data	
11	No data	

The worst settling was seen in Region 5, which was built on the least stable fill. Regions 1 and 7 are somewhat better.

Liquid level readout number 219 is located in the straight section at 2B. This area showed 1.38 mm of settlement from April to June of 1979. This was the fastest settlement seen at PEP and is probably related to some geologic irregularities which were noted in the area during the construction of the accelerator housing. Liquid level readout number 219 had to be moved recently, so no data concerning subsequent settling is available.

Generally speaking, the settling appears to be relatively minor over the past six months. Since the settling has occurred over very long sections of PEP, it is not likely to cause very serious closed orbit distortions.



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