1. Introduction

1.1 Problem

![Diagram of siphon breaker simulation program]

IDAH0: Main pipe 4inch
Height 16m

POSTECH: Main pipe 16inch
Height 16m

HGU: Main pipe 2inch
Height 2m

1.2 Research Objective

- IDAH0
- POSTECH
- HGU

2. Experimental Facility

2.1 Schematic Diagram

- Total height: 2.5m
- Upper tank height: 0.65m
- Main pipe size: 2"
- SBL size: 1/4", 3/8", 1/2"
- LOCA size: 1", 2"

2.2 Experiment Facility

3. Research Result

3.1 Flow rate

- Figures 3.1 to 3.4 show the data of every 0.2 seconds.
- Figure 3.1 shows the flow rates over time calculated by measuring the weight of efflux water.
- Figure 3.2 shows the water level changes measured by the absolute pressure transmitter at the bottom of the upper tank.
- Figure 3.3 shows the absolute pressures at the point 2 where the SBL meets the apex of the main pipe.
- Figure 3.4 shows the results of the differential pressure between the point 2 and the point 3.
- Results of L1S1/4 and L2S1/4 show full sweep-out.

3.2 Absolute pressure of upper tank

3.3 Absolute pressure of point 2

3.4 Differential pressure between point 2 and point 3

4. Discussion & Conclusion

4.1 Results of undershooting

- The experiments for the SBL sizes of 1/2 and 3/8 are within the range of Kang et al. [4][5] considering C factor and Chisholm B coefficient. However, the SBL size of 1/4 is out of the range.
- In the SBL sizes of 1/2 and 3/8, the undershooting heights were less than 10cm and the SBSP predicted well the data.
- However, the SBL size of 1/4 which had full sweep-out mode during about 5 to 15 seconds showed higher undershooting height, and the SBSP didn’t predict the data. But, the conditions with big undershooting height are not considered in designing the actual research reactors.

4.2 Results of C factor & Chisholm B graph

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- So, the SBSP can be useful to design the siphon breaker of research reactors with various main pipe sizes.

Reference