IA-E-104

Step I Go to Natural Circulation-with Pressurizer Solid

A. Float core flood tanks at B&W set pressure, but with tanks solid and pressure coming from N_2 tanks outside containment. This is to expedite conversion to Step II if and when deemed desirable.

B. All valves from primary system to Auxiliary Building closed except for occasional use of core flood tank fill line to make up losses.

Step II Conversion to Benign Building

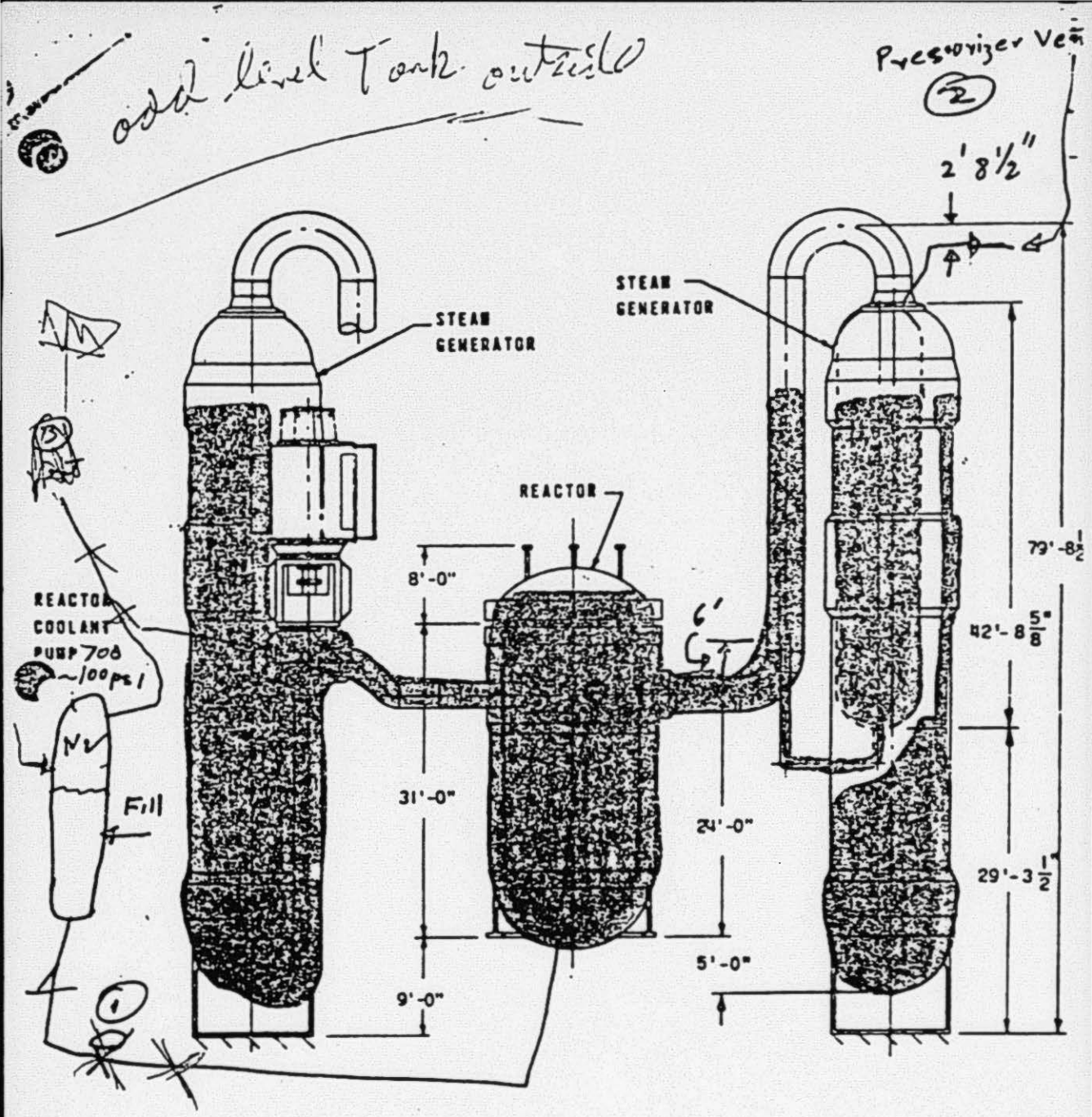
A. Remove high pressure N_2 supply from core flood tanks.

B. Open Pressurizer Vent valve. Leave open. Pressurizer Sample Line should have been rigged in reentrant mode back to containment so that if the vent block valve cannot be opened, the sample line is a fall back.

C. Eventual steady state may result in occasional bubbles rising through flooded pressurizer.

1. Water (plus additives such as H_2O_2 if desired) can be added via core flood tank fill line.

D. Eventual state may permit isolation of steam generator secondaries and use of hot drain coolers as heat sinks--needs to be looked at.

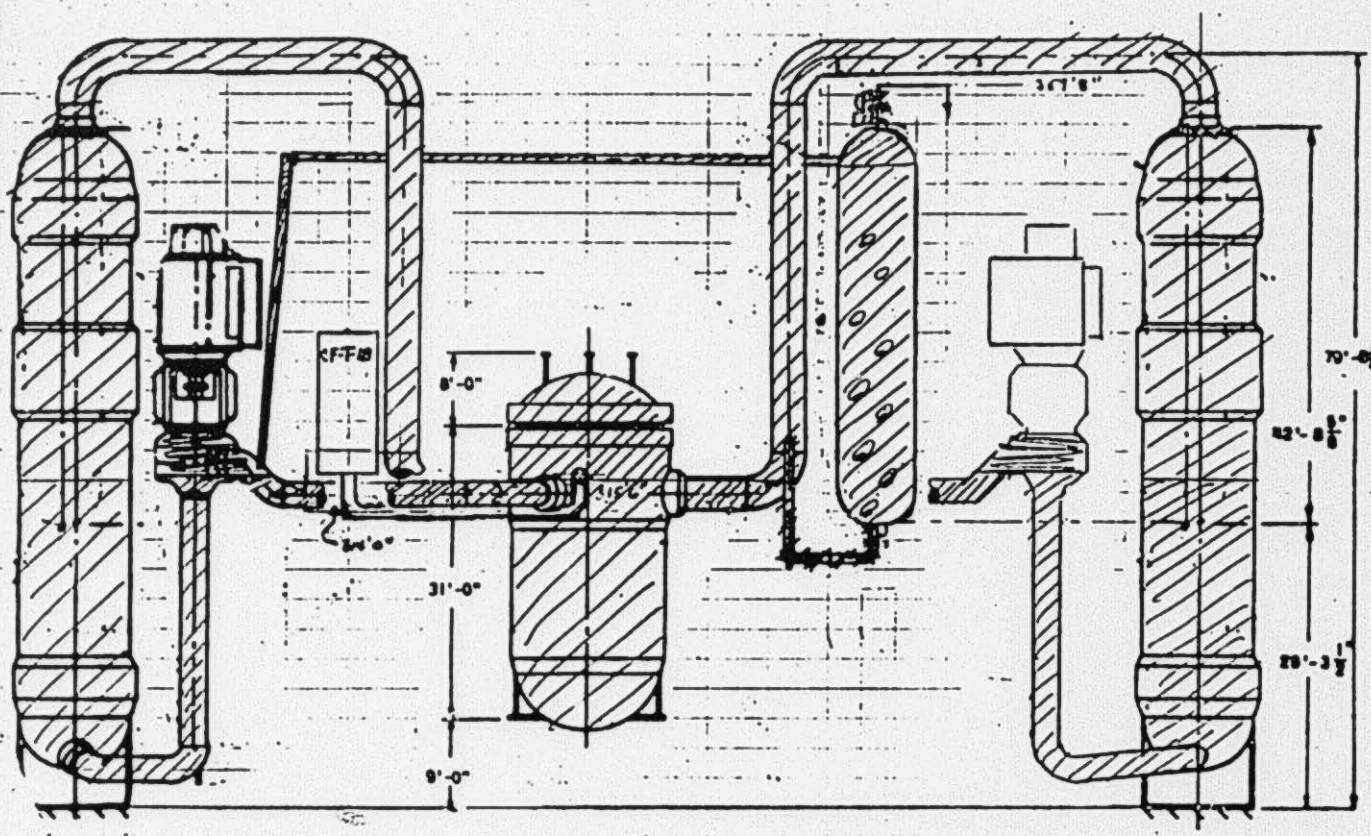


REACTOR COOLANT SYSTEM ARRANGEMENT – ELEVATION

THREE MILE ISLAND NUCLEAR STATION UNIT 2

FIGURE 5.1-5

Equalizing



TMI-2

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Under Milt Levenson's proposed cooling mode, the pressure in the PV will start at zero psig and then start to increase slowly as the gas bubble above the core grows until this pressure is high enough to drive water out of the pressurizer at the rate required to balance the rate of bubble formation.

When the bubble reaches the top of the core-flood nozzle of the PV, gas will begin to accumulate in the line to the accumulator. This may interfere with trying to measure the water level in the PV via the core flood tank.

When the bubble reaches down to the top of the hot leg, gas begins to bubble up to the top of the candy cane. I believe that some of the P.S. water in the steam generator will flow out through the cold leg to replace the gas from the bubble (above the core) that goes to the candy cane. The PV level rises slightly. Again the pressure of the bubble will rise to uncover the top of the hot leg port of the PV and more gas will go to the top of the candy cane. This process will continue until the PV level and the pressurizer surge line level reaches point A in figure on Page 2. (See below for sketch of the uncovering of top of hot leg port as discussed above.

There will be a period of time when the flow through the core and to the pressurizer will stop. This will occur while the gas is building up enough pressure to drive the water level in the pressurizer surge line from point A to point B. This requires that the pressure in the PV gets high enough to overcome the static head in the pressurizer above point B plus any ΔP across the vent valve or about 20 psig. (See figure on next page)

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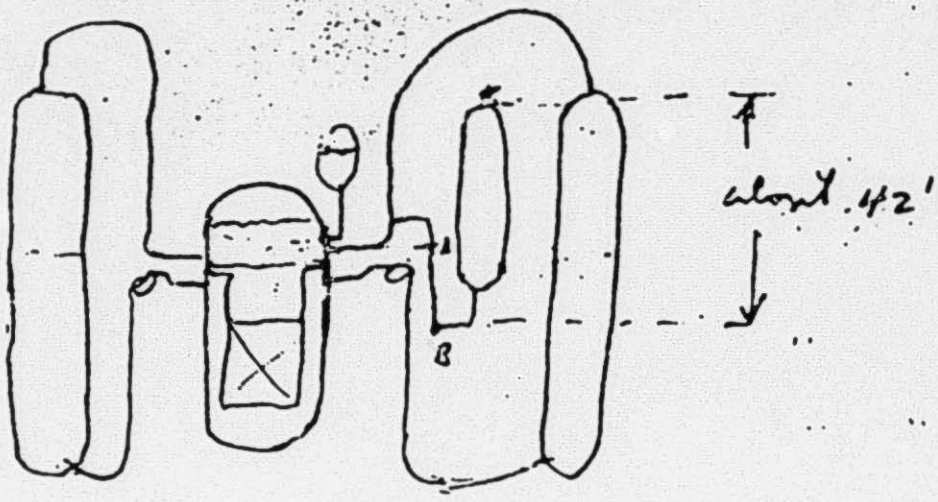
4/8/79



When the level in the surge line reaches point B, the gas will perculate up through the pressurizer water.

During this period of time, the core will continue to both give off gas and to heat up and then boil at this higher pressure. The boiling will help increase the PV pressure faster and speed up the change in level from points A to B.