

the water was removed to inspect the exterior of the tank for corrosion, and give it a protective coating of epoxy paint. The water was replaced after run 39 and will remain in place for the foreseeable life time of the experiment. Measurements of the fast neutron background effect from the surrounding rock (amphibolite and rhyolite containing 0.1 to 5 ppm U and 1.3 to 24 ppm Th) and concrete floor were made with a calcium radiochemical neutron detector that depends upon the $^{40}\text{Ca}(n,\alpha)^{37}\text{Ar}$ reaction. We estimated from these measurements that the background ^{37}Ar production rate by neutrons in the bare tank is approximately 0.04 per day. This rate is too small to measure directly by water-on versus water-off experiments with the 3.8×10^5 liter tank.

A sample was extracted from the tank on a somewhat irregular schedule because in the course of the experiments there was a continual effort to improve our sensitivity by reducing counter backgrounds and on occasion an experiment was delayed until a lower background counter was available. On the other hand some experiments had a short period of exposure because of the occurrence of an astronomical event of special significance.

Results

The counts observed in the ^{37}Ar energy-rise-time region are listed in Table 1 for a series of counting periods of approximately 35 days duration. Table 2 lists the initial and final date of the exposure, and the calculated number of ^{37}Ar atoms present in the tank at the time of purging. In these calculations the normal corrections for decay of ^{37}Ar , counting efficiency, and argon recovery efficiency were made. The counter background was determined using the recorded counting rates for the periods of time after the ^{37}Ar decayed, periods III or whenever possible. later/ The errors noted are derived from the square roots of the number of recorded counts. The combined error in recovery efficiency, counter efficiency and decay corrections is less than 10 percent. This table contains all experimental da