

November 4, 1980

NEUTRON ABSORBER SAMPLING PLAN - IN POOL

A sampling plan to verify the integrity of the neutron absorber material employed in the high density fuel racks in the long-term environment is described.

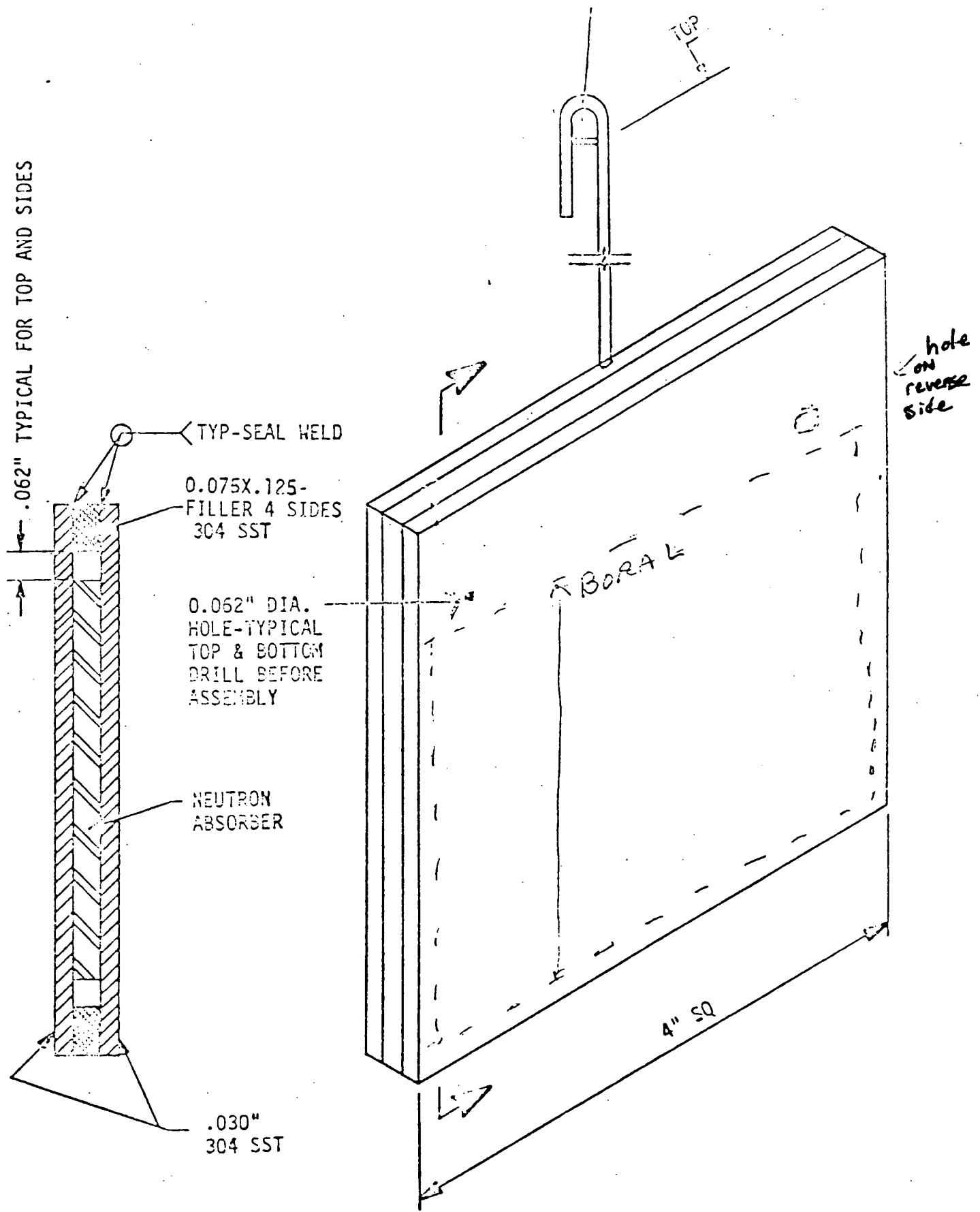
The test conditions represent the vented conditions of the spent fuel tubes. The samples will be located adjacent to the fuel racks and suspended from the spent fuel pool wall. Eighteen (18) test samples are to be fabricated in accordance with Figure 1 and installed in each pool when the racks are installed. The selection of Boral for the samples should be representative of what is used in the tubes.

The procedure for fabrication and testing of samples shall be as follows:

1. Samples shall be cut to size and dried in an oven for five hours at 170°F, followed by a cycle at 600°F for three hours.
2. Samples shall be weighed immediately following removal from the oven and weight in milligrams recorded for each sample.
3. Samples shall be fabricated in accordance with Figure 1 and installed in the pools.
4. Two samples shall be removed per schedule shown in Table 1.

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5. Carefully cut samples apart at the weld without damaging the neutron absorber. Wash with a soft brush in a mild abrasive and detergent solution, immerse in nitric acid to remove surface products, followed by a rinse of clean water and alcohol. Dry in a 170°F oven for five hours, followed by a cycle at 600°F for three hours.
6. Weigh the samples and evaluate the weight change in the neutron absorber material in milligrams per square centimeter per year.
7. Visually examine the clad surface for pitting. Take micrographs of the edge surface and any other suspect areas.
8. If pitting is present, the depth of the four major pits are to be recorded and the average pit penetration in mils of an inch per year determined.
9. Prepare report of sample test results and observations.
10. Should any adverse conditions be detected, the samples may be subject to a B<sup>10</sup> loading analysis.
11. Additionally, two full length vented fuel storage tubes will be suspended in each pool and be examined should the sample program indicate any loss of absorber material below .02gm/cm<sup>2</sup>, Boron<sup>10</sup>.
12. Retain samples.



hole on reverse side

BORAX

4" SQ

18 SAMPLES

Figure 1.

TABLE 1

SAMPLE NO.	SCHEDULE	Date Installed			
		INITIAL WEIGHT (mg/Cm <sup>2</sup> -Yr)	FINAL WEIGHT (mg/Cm <sup>2</sup> -Yr)	WEIGHT CHANGE (mg/Cm <sup>2</sup> -Yr)	PIT PENETRATION mil/Yr
1					
2	90 day				
3					
4	180 day				
5					
6	1 year				
7					
8	5 year				
9					
10	10 year				
11					
12	15 year				
13					
14	20 year				
15					
16	30 year				
17					
18	40 year				