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FILE

~~AB Gensinger~~

SUBJECT Pile Technology Division Technical
Activities Report - Materials Testing
Group - March, April, 1950

9-25-56

FROM JB Lambert

COPY NO. 1A

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June 28, 1950

SUBJECT: FILE TECHNOLOGY DIVISION TECHNICAL ACTIVITIES REPORT

COPY 1 OF 1, SERIES 10

MATERIALS TESTING GROUP

This document consists of

3 pages. No. 1 of 1

MARCH - APRIL, 1950

HIGH PRESSURE WATER CHANNEL (ANL-140) - D. F. Snoeberger

Status of installation: 3000 psi hydrostatic testing of the external equipment is in progress. Leaks, and plugged instrument lines are being corrected as discovered. Assembly of the pile tube mockup is continuing; shielding and the step plug assembly have yet to be added.

Revision of Dwg. P-3537 has been requested to add the provision of automatic pile shutdown as a result of low system pressure, in addition to those already planned.

The principle items of equipment not yet received from ANL are:

1. Oil cooling system for the primary system heat exchanger.
2. Bailey (Pressure-Temperature comparator) scram instrument.
3. G. E. Reactrol for controlling the surge tank heaters.

Installation of these items is desirable but not absolutely necessary before the "cold run" for equipment run-in and operational training of operators.

Work was recently reappraised to see if the charging schedule could be moved forward. It still appears, however, that the pressure tube can not be put in the pile before June.

KAPL FUEL ELEMENT TESTS - (SR-79, Beta Experiment) - W. E. Welch

R-4 (depleted natural uranium foil) was discharged from 1077 F on April 5 after irradiation for 27 days at rated power of 305 MW and transferred to 100-D for cooling.

J-4 (spun Ti pin) had been in 0865-F (80%) for the equivalent of 105 days at 275 MW through April 30. It is expected that discharge of this unit can be effected during the second shutdown in May.

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The unit F-1 (UO_2 in s.s. pin) charged into 1071-F during March for 10% burn up had been irradiated for 50.8 days at rated power.

Slug assemblies R-2 (U-238 foil), and R-3 (natural uranium wire and a 3/4" s.s. holder) have been received from Schenectady and will be charged into 100-F pile as conditions permit.

The Co Integrator in cask C-3 was transferred to 300 Area for checking.

A cask for dry storage of the previously discharged units B-6 and B-9 was completed. These units are to be so stored until further required.

UNDERWATER FACILITY FOR OPENING SR SLUGS - W. M. Haussler

This facility consisting of an adjustable depth working tray contained in a tank to isolate any contamination, will be installed in the vessel pit in the 100-H storage basin. The 101 shops estimated the fabricating cost for the facility at \$1,325 and were given a work order for the job. The completion date will be about May 19th.

100-H Maintenance estimates 60 man-hours for the installation of the facility in the basin. Since draining the basin breaks the water seal on the ventilating system of the 105 Building the underwater portions of the facility will be installed when the unit shuts down for the Navy Rig thimble installation.

STRENGTH OF MASONITE AT ELEVATED TEMPERATURES - W. M. Haussler

Experiments on the strength of masonite at elevated temperatures have been completed and report No. HW-17630 issued. In this test, samples of masonite similar to that used in the B blocks were exposed to temperatures up to 210°C for periods up to 200 hours in air, to determine the effect of degree of decomposition on the breaking strength. It was observed that 130°C was a critical temperature, above which the rate of decomposition was rapid, but below which negligible decomposition was discovered in the 200-hour test.

CONTROLLED TEMPERATURE OF GRAPHITE - W. M. Haussler

In this test, graphite samples will be irradiated at controlled temperatures in an "annular process tube", which consists of an inner tube in a process tube with water flowing in the annulus.

The design of the heater coils surrounding the samples has presented some difficulties in the selection of a suitable insulating material which will stand up under irradiation in the pile. The original plan was for an aluminum coil form with an anodized surface forming an electrical insulator for the spiral of nichrome heater wire. Attempts at anodizing by both the Instrument Shop and myself failed to produce either a continuous coating or one with sufficient thickness to stand the required voltage. The present design will use a steel coil form with heater wire sandwiched between built-up layers of Alundum cement

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which is the only known ceramic able to withstand continued irradiation. As a last resort, an alumina thermocouple well will be used, although it will not be as good a heat distributor as the metal-lined, alumina-insulated type described above. Other aspects of the slug design have been worked out satisfactorily and the "inner tube" installation and shielding problems are currently being considered.

J. S. Lambert
PILE TECHNOLOGY DIVISION

JB Lambert/wj

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