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FROM: M. S. BLOOMSBURG *MS*

WEEKLY REPORT - NOVEMBER 11-17, 1955
300-M AREA - SAVANNAH RIVER PLANT

1. ITEMS REQUESTED OF ENGINEERING

Increased Productivity Program

Design work on location and layout of the Mark III and Mark VI fuel production facilities is proceeding in preparation for the second design meeting scheduled for November 22nd. Preliminary design money committed to the Mark III facility now totals \$95,000 (WR-50026) and to the Mark VI fuel facility totals \$75,000 (WR-50007).

II. ITEMS OF INTEREST

Hollow Uranium Slugs

Current estimates indicate that about 320 each or a total of about 640 hot-press-bonded and AlSi dipped hollow uranium slugs will be available for loading in R-8. Charging of the load has been delayed 10 days beyond the original dead line of November 15th to enable processing of these pieces.

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Sylvania is scheduled to complete canning of LMF material for SRP on 11/19 and to start Mark VII canning again on 11/21 to furnish 1050 acceptable pieces for R-9 loading. Aluminum cans and spires are now on hand at SEP. Fernald expects to ship about 100 bare cores to SEP by air express Friday afternoon, followed by 100-200 more on Monday afternoon (11/21). Continued flow of material from Fernald thereafter is in some question and it is probable that SEP canning may be delayed initially because of lack of cores.

Preliminary design of a revised finished product shipping tray for Mark VII slugs has been prepared by Engineering. Several sample trays to the new dimensions are currently being prepared by a vendor for evaluation.

DWB/ms

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5/19/55

Reactor Complex

A gear reducer will be necessary to drive larger moderator pumps which require a lower speed than the present pumps. Discussions with three manufacturers of gear reducers indicate agreement that the application will require "precision" gearing as opposed to "commercial" gearing. However, as a "precision" gearing application, the speed, load, etc., are well within normal ranges, and the gear reducer should be no problem to manufacture, and should be very reliable in operation.

LaboratoryNFE Program

A substantial shipment of B-process tubes has been made to SRL and will permit a full scale CMI test program on Mark III components. Tests will be continued (1) to demonstrate methods of preventing destructive vibration, and (2) to explore the ability to monitor flow and temperature in this configuration of fuel element. Development of this Mark III component is within striking distance of a plant process.

Shipment of spiral rib tubes for Mark IV components are much improved in dimensional tolerance and will facilitate further test work on this program. Preliminary examination of a dimpled housing that had been in flow test for one month appeared extremely promising. Tools of the latest design to accomplish this dimpling will be used on test specimens for the first time during the coming week.

LMF ShipmentsOperational Physics Sub-Committee Meeting on 5/18

Xenon override procedures are being prepared based upon curves to be issued showing times (at various power levels) during which the reactor cannot go critical, or to full power levels. The control rods would not be withdrawn during the period for which the curves indicate criticality to be impossible, if, however, criticality is not achieved, the rods would be left out provided there is a signal on the log N system and the flux is increasing. When reactivity is above critical and increasing, it is calculated that the rods would have to be inserted less than 100 V.U. in 10 minutes to hold the reactor at its existing level. This leads to the conclusion that it is permissible to withdraw rods completely to override the xenon transient and to leave them out as long as the period is measurable and the reactivity is increasing. The recommendation was made that power be raised as rapidly as possible under present procedures in order to burn out xenon.

In start-up after partial discharge, the standard start-up procedure appears safe. With a ring source in the reactor, the specified multiplication of 10 is believed adequate to give a good picture of increase in flux and provide a good test of radiation instruments before reaching critical, even though in this case the rods may be within 40 - 50 V.U. of critical.

Perturbations in C Area at 200% power are 3 MW (peak to trough) median and 25 MW maximum. In P at 177%, with hot upflow supply to the septifoils, the median is 1.6 MW and the maximum is about 5 MW.

5/19/55

In the Nuclear Physics Sub-Committee meeting, the conclusions of rod oscillation tests in the PDP were described. Along with some anomalous results, it was observed that in running such tests in a reactor, the rods oscillated should be across the reactor from the flux-measuring chamber. Proximity effects were minimized in this way. The question was raised as to what exposure should be adopted for the R-6 core-mixed charge because the expected exposure of the 38 would exceed 25 ngs for the uranium.

Slugs removed in P-5 discharge are being inspected. About 10% show "birch-bark" shaped pimples about 2 mils high. Further observation is being made, along with correlation versus position in reactor and source of slug.

Instrumentation

The principal subject at the Nuclear Instrumentation Sub-Committee meeting on 5/17 was analysis of the injection test results and discussion of future program. Tentative recommendations include:

1. installing a delayed neutron monitor in each area
2. converting all PWGM's to single channel, 2 to 3 mev.
3. installing a gross activity meter in each area, with ten minute delay
4. simplifying the PWGM circuits like the trial unit in C Area if this continues to be satisfactory.

Injection test results to date involve many apparent discrepancies. The requirements of a further test to answer some of the questions are under study.

Disassembly

If, as indicated recently, the LM program is to be limited to partial loads in R-6 and R-7, plus relatively small test quantities after that, the only facilities justified for disassembly appear to be buckets, yokes, and casks for shipment. Discussion with the Reactor Department confirmed that loading slugs into the special buckets (or tote boxes) can be done with present equipment. A high spot study is being made of the economics of different cask designs for this limited amount of shipment.

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