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Explosives Department
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1. *ADD* *1/23/89*
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2. *ADD CO* *2/4/89*
Name Title Date

TO: J. B. TINKER (IN
W. C. KAY TURN)
B. H. MACKAY
L. SQUIRES
S. A. McNEIGHT

FROM: H. W. BELLAS

#2. H. Worthington - D. F. Babcock
#3. M. H. Wahl - C. W. J. Wende - SRL
#4. D. A. Miller - W. S. Church - SRP
#5. A. A. Johnson - SRP
#6. H. W. Bellas
#7. W FILE
#8. SP FILE

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WEEKLY REPORT - 100 AREAS - JANUARY 20, 1955.

Assembly Area

Alcoa can supply complete Q-foils to SRP by undertaking procurement and inspection of all parts, thereby relieving SRP of current responsibility for supplying these to Alcoa for assembly. However, the cost to us would be approximately \$20 more per Q-foil; for example, \$140 versus approximately \$120 now for Q-foils with flow guides. At approximately 1500 tubes per month, the \$30,000 additional cost certainly does not appear justified.

Harvey Machine Company's Q-foils (2) have arrived at SRP and will be given an inspection tomorrow.

Anti-cross-flow sleeves of aluminum, 2-1/2" long, are on order for inclusion in future Q-foil production pending satisfactory completion of current tests at CMX and "C" dummy run. Data from these tests will be available about January 31.

Fairchild has quoted a price of \$1.12 each to clean up the stainless steel sleeves to which they added aluminum end rings for welding. We believe we are not justified in paying Fairchild to bring these sleeves within specification and plan to hold the sleeves at their plant pending clarification of this point and all test results of the above sleeve tests. (Aluminum sleeves cost \$0.12 each).

New fuel elements are being reviewed in Design with SRL personnel. We have submitted suggestions to SRL on end fittings and to Design Division on crane modifications for their handling. In the latter connection, we have asked Design to modify the design of the A mast inner chuck and seal sleeve to permit handling the new type of top end fitting. We would prefer to do this with the A mast rather than with the B mast, which would otherwise require provisions for cooling and for sleeve removal. Unless major changes are to be made to the structure of B mast or C mast, we would prefer to handle all fuel and target elements with the A mast. Drawings of other proposed end fittings are awaited from SRL, and closer liaison with SRL on such matters is desired.

The safety brake on the latch hoist is now complete and in operation in Building 105-C.

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Reviewing
Official
J. B. Tinker 2/4/89

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1/20/55

Spiral drum actuators for safety rods are to be tested by the Instrument Assistance Group of Works Technical within the near future. Three units had been built for this purpose by SRL. The next step proposed, to purchase six from an outside vendor and test them in Building 105, will not be undertaken unless there appears to be more justification for replacement of the existing actuators. There have been very few occasions of unsnubbed fall of safety rods, and most of these could have been prevented by currently proposed changes in the snubbing circuit.

An injection test in the cooling water gamma monitor system has indicated that in the L, K and C arrangement of instruments a leak of 10 - 15 gallons per day of moderator into the cooling water can be detected. It is now planned to have the instruments in R and P relocated to a position similar to those in L, K and C.

The automatic reactor controller, connected to a Westinghouse compensation chamber, is being wired into the 105-C Building circuits and may be ready for functional testing next week.

Reactor Complex

Larger moderator pumps, being studied by Design Division, are in the stage of preparation of specifications to be submitted to several vendors. Recent progress has been delayed an annular shield problems in 105-C.

The annular shield tanks in 105-C are well along in replacement of staybolts in Tanks 1 and 2. Nine of the 20 bolts being worked on have been completed and five are in various stages of welding in new bolts. Five are being dressed for welding and the remaining one is in the process of arc cutting. All trepanning having been completed, steps will soon be taken to re-install the upflow piping.

Recent tests of staybolts at the University of Delaware have included the following: (a) a fatigue test of the original design of staybolt weld but with only 1/2" depth of weld, which resulted in failure at 268,000 cycles. The last 46,000 cycles stressed (bending) the bolt at 60,000 psi. Failure occurred in the bolt which incidentally was not tightly bound in the collar. (b) A fatigue test of the repair design at 60,000 psi (bending) resulted in failure in the bolt at 163,000 cycles. (c) A pull test on a welded staybolt removed from No. 2 tank resulted in failure in the weld at 64,000 lbs. tensile force. Failure appeared similar to those of the first two leaks in No. 1 and No. 2 tanks. A visual inspection before sectioning shows that the weld was about 3/8" deep except for certain shallower sections in the threads. The diameter of the bolt in the root of the threads was about 15/16" so that the shearing stress at failure was 54,000 psi and tensile stress in the bolt reached a maximum of 93,000 psi. Another "dimpled" staybolt weld was found at the inner end of position 15 from which one can make the interesting observation that all four bolts in the third row from the top were in either the initial or final stages of failure. Neither leaks nor "dimpling" have appeared elsewhere. The remaining tests to be performed on staybolts include (a) a cycling test in tension, using a 3/4" deep weld, (b) a bending fatigue test, using a fully effective 3/8" deep weld, and (c) a pull test on a typically unfailed bolt from No. 1 tank. Testing to be performed on the completed tanks 1, 2 and 3 consists of a one-hour hydrostatic at 12 psig with

measurements with strain gages and motion measuring equipment. Instruments to be installed in the completed shield include some additional thermocouples on the outer wall, a device to be inserted in the top instrument hole for measuring relative motion of the inner and outer walls and remove reading instruments for measuring relative expansion of staybolts at the outer tank wall.

Disassembly

Some prototype buckets for LMF shipments to Arco have been received and sent to Callahan at ORNL for criticality measurements.

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