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DPW-56-371

(SR/H--785)

Explosives Department
Wilmington, Delaware

- #1. J. B. Tinker - R. J. Christl
- #2. H. Worthington - V. R. Thayer
- #3. L. S. Danser - J. K. Lower - SRP
- #4-5 L. S. Danser - S. D. Smiley - SRP (2)
- #6-7 L. C. Peery - E. T. Cook, Jr. - SRP (2)
- #8-9 M. H. Wahl - J. W. Morris - SRL (2)
- #10. A. E. Daking - Eng.
- #11. J. E. Crawley, Jr.
- #12. W FILE
- #13. SP FILE

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MEMORANDUM
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TO: FILE

October 9, 1956.

FROM: JOHN E. CRAWLEY, JR.

REPORT OF TRIP TO LOS ALAMOS, ALBUQUERQUE OPERATIONS OFFICE, AND ACF INDUSTRIES, SEPTEMBER 17 - 19, 1956.

The following people visited Los Alamos Scientific Laboratory September 17 and 18, ALOO and ACF Industries, Inc., Albuquerque, September 19:

- J. B. Tinker - Wilmington
- R. J. Christl - Wilmington
- J. E. Crawley, Jr. - Wilmington
- W. E. Egan - Savannah River Plant
- R. M. Girdler - Savannah River Plant

At Los Alamos the principal subjects discussed were reservoir design, and reservoir shipping specifications. In Albuquerque a meeting was held with Albuquerque Operations Office personnel to discuss design and procurement of shipping containers, followed by discussions with ACF of reservoir fabrication and testing.

Reservoir Design

Engineering Department comments on reservoir design, presented in letter Wilson-Shafranek to Tinker-Christl, 9/13/56, were discussed with L.A.S.L. and A.C.F. representatives. These comments were resolved satisfactorily. It was pointed out, however, that the general specifications should be more specific with respect to means of checking for incipient failure, and methods of cleaning and verification of cleanliness of the finished reservoirs. We agreed to send copies of the cleaning specifications for equipment in Building 232-H and 234-H to aid L.A.S.L. in writing a similar specification for reservoirs.

The transverse tube closure designed by L.A.S.L. to effect temporary sealing of the reservoir prior to welding has been tested on about thirty reservoirs. This closure has not been entirely satisfactory so far, and has many inherent problems in fabrication, inspection and testing. We again presented our alternate closure for consideration. Over 2,500 "pinch-weld" closures have been made successfully, with helium pressure inside the tube in the range of 10,000 to 15,000 psi. The only failure occurred when a tube was not properly placed between the electrodes, and about half the tube cross section was pinched. Based on the evidence presented, L.A.S.L. agreed to

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have several test reservoirs equipped with tubes for "pinch-weld" closing. This will demonstrate feasibility of adapting the "pinch-weld" closure to the present reservoir design, without changing overall dimensions. We agreed to carry out the following program:

1. Make a number of closures using hydrogen as the pressurizing gas.
2. Make several (four) closures using a jig to hold rigidly the ends of the tube, simulating the condition that would exist if the tube were installed in a reservoir.
3. Make ten closures using hydrogen, and send them to L.A.S.L. together with ten made using helium. These tubes are to have high pressure fittings on the open end. L.A.S.L. will pressure the samples to failure, to determine any difference that may exist. The effect of hydrogen will have to be quite marked if significant conclusions are to be drawn from these tests. In the tests we have made the welds ruptured generally in the range of 30,000 to 40,000 psi, but one failed at 21,000 and one at 46,000 psi, all having been made with helium inside.

Shipping Containers

ACF Industries, Inc. is interested in supplying reservoir shipping containers, and prepared a preliminary design for our review and comments. We approved the general arrangement as proposed, with relatively minor comments, and requested that detailed design be submitted for our review when available.

The proposal that ALOO purchase shipping containers from ACF Industries was discussed with representatives of both groups on September 19. ALOO seemed to be in favor of assuming responsibility for procurement of the containers, which previously had been understood to be a Du Pont responsibility. A final decision will be made after ALOO receives the formal proposal from ACF.

Test Reservoirs

Forgings for 50 1-A and 50 2-A reservoirs were ordered by ACF, with delivery expected early in October, 1956. Shipment of the first completed units will be early in November if material is received as scheduled. Placement of a formal order for the 100 test reservoirs is still awaiting (10/9/56) receipt of a quotation from ACF.

Laboratory inspection of the test reservoirs will be the same as that proposed for the production units. This will include X-ray examination of the girth weld, volume check and adjustment using the liquid filling technique, proof test at 10,000 psi, and leak test at 5,000 psi to a specification of 10^{-9} atm cc/sec, maximum. No commitment was made as to the type of closure to be incorporated in the test reservoirs.

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Shipping Specifications

A preliminary shipping specification for the filled reservoirs, prepared by L.A.S.L., was reviewed. This specification requires accuracy of loading which seems unrealistic with the instrumentation and control now commercially available. The product purity requirement may also be difficult to achieve. We requested that L.A.S.L. reconsider the specification in the light of the comments offered, and submit it to us for detailed review and comment.

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