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AGENCY UPDATE–SAVANNAH RIVER PLANT

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AGENCY UPDATE

SAVANNAH RIVER PLANT

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PERSONNEL

The personnel associated with tritium work has been relatively stable since our Spring meeting. Two new mechanical engineers have reported to Equipment Engineering while Mark Devoe has transferred to the Tritium Dept. where he will be the Senior Supervisor of the Bldg. 238-H Reclamation Facility. Ed Franco-Ferreira, whom some of you know, has joined us as a welding engineer. Until he gets his clearance he will be working on reactor repair techniques. R. H. Tait has transferred to Du Pont Commercial and R. L. Cook has moved over from EED to assume the responsibilities for Tritium Department operations.

PROGRAM ACTIVITIES

W84 / MC3443 - The pinch welding procedure for loading these bottles has been developed, but the procedure, coupled with the production fixtures, has not been tested in the production facility. In the meantime test bottles and simulated bottles have been loaded and welded by the Equipment Engineering Department (EED) in Bldg. 723-A. The confined-tube welding procedure uses 3/32" cyl rad electrodes and no bottom end restraint.

The production welding fixtures were fabricated of Ampco™ -18 bronze. After the fixtures were assembled and accepted, our production people told us that the material was not acceptable and that 17-4 would have to be used. Consequently, there will be a delay in getting the production fixtures delivered to the Tritium Department.

Reclamation of 3T Reservoirs - Progress on the reclamation of the 3T reservoir is proceeding slowly. A test fixture has been built that will help to answer a number of questions regarding the feasibility of reclaiming these bottles. The reclamation scheme being proposed involves laser unloading followed by evacuation, backfilling, and welding a cap over the laser-pierced hole. This process would be

repeated for each deployment cycle. Demonstrations of this process are being made using a special fixture that adapts to our pinch welders and allows the operations to be carried out in a tritium atmosphere.

Reclamation of SP 1030/1031 Reservoirs - We have not reclaimed any of these reservoirs on a production basis yet although the TMS has been satisfactorily conducted. During the production check out of the fixturing and during the TMS, it was noticed that the welds were slightly hotter on one side . This was attributed to slight cocking of the replacement tube relative to the reservoir during welding. Although the welds were satisfactory, it was decided to modify the fixture to prevent the apparent cocking that occurs when the off-axis welding force is applied. The modification has been made but testing has not begun.

Pinch-Weld Procedure Standardization - Work continues on the standardization of pinch-weld procedures. Present efforts are the universal pinch-weld fixture, elimination of bottom end restraint, and standardization of the electrode.

The universal fixture has been fabricated and tested satisfactorily, and the required adapters have been designed for about 80% of the reservoir types that will use the fixture. The plan is to use this fixture in Bldg. 234-H production to work out the bugs and to demonstrate its acceptability before the Replacement Tritium Facility (RTF) is completed. Ultimately the fixture will be the fixture used in the RTF.

It has been shown that bottom end restraint can in fact be eliminated for all confined-tube welds. This will make the fixturing much less cumbersome and should result in a considerable cost savings in the RTF. It is not yet clear whether bottom end restraint can be eliminated for all non-confined pinch welds.

Work has just started on the standardization of the electrode radius. Currently we use two sizes of electrodes, 3/32" cyl rad and 3/16" cyl rad. There is much debate right now as to which of four alternatives offers the best solution:

- 3/32" cyl rad electrodes
- 3/16" cyl rad electrodes
- Try to live with the intermediate 9/64" cyl rad electrode
- Accept the fact that two sizes are required

Reactor Repair Techniques - Gas Metal Arc Welding is being investigated as a means of effecting a structural repair to reactor vessels subject to helium embrittlement. The process offers a means of applying a deposit onto the tank wall with minimal heat input. Such tricks as magnetic oscillation in the spray transfer mode and mechanical oscillation in the short arc mode are being investigated to further minimize the heat input to the base metal. Another approach is to preheat the weld wire in a fashion analogous to hot-wire TIG welding. This is a process that has been developed by Westinghouse.

Assuming that we still have weld toe cracks after taking these measures, techniques for sealing the cracks are being developed. Colloidal suspensions of glass are being applied to intentionally cracked welds and then the weld heated to 200-300 °F with a hair dryer. It has been shown that sizable cracks, much larger than anticipated in the weld toe cracks, can be sealed to 15 psig air pressure using this technique.

EQUIPMENT

No new equipment acquisitions have been made since the spring meeting. The Equipment Engineering Weld Development Laboratory is partially functioning. The reclamation welder is finally hooked up and is undergoing tests.

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