



Interoffice Memorandum

SRR-LWE-2012-00030, Revision 1
Page 1 of 7

November 28, 2012

TO: M. D. Buxton, 241-284H

FROM: S. J. Worthy, 241-162H *SJ Worthy*
J. R. Tihey, 241-162H *JR Tihey*

TANK 12 COOLING COIL FLUSHING STRATEGY**Revision Note:**

1. Changed the occurrence of cooling coil flushing from immediately after the second Oxalic Acid (OA) / sludge slurry solution transfer to Tank 51 to prior to the final Oxalic Acid (OA) / sludge slurry solution transfer.

Background:

As designated in the Liquid Waste System Plan, Revision 17 and to support the Federal Facilities Agreement (FFA), Tank 12 is scheduled to close by the end of Fiscal Year 2015. Tanks at the site are being closed in accordance with a formal agreement among DOE, Region IV of the U.S. Environmental Protection Agency (EPA), and the South Carolina Department of Health and Environmental Control (SCDHEC) expressed in the SRS Federal Facility Agreement (FFA). DOE intends to remove from service and operationally close (fill with grout) Tank 12 and other High Level Waste (HLW) tanks that do not meet containment standards established in the FFA. In order to proceed with closing Tank 12, DOE must first demonstrate that the closed tank will comply with Section 3116 of the National Defense Authorization Act (Public Law 108-375, 2004). Section 3116 criterion for closure includes the removal of highly radioactive radio nuclides to the maximum extent practical. Additionally, the closed tank must meet certain concentration limits and performance objectives for low-level waste.

During the closure process of this tank, exterior contamination will be removed from the coiling coils during mechanical mixing, oxalic acid cleaning, and water wash campaigns. Cooling coils with guillotine breaks and failed coils (27 vertical cooling coils and 1 horizontal cooling coil)

will be flushed with facility well water to remove any waste that has migrated to the interior of the coils.

Cooling coils that are “In Service” (3 vertical cooling coils and 1 horizontal cooling coil) and “Standby” (4 vertical cooling coils) will be addressed during the grouting phase. Full scale cooling coil grout fill demonstrations were performed and analyzed in WSRC-STI-2008-00298.

Discussion:

During the Chemical Cleaning Process for Tank 12, Oxalic Acid will be added to the remaining sludge in three (3) stages. The acid will be agitated via the existing Standard Slurry Pumps (SLPs) and then transferred to Tank 51 for further processing. Prior to the final Oxalic Acid (OA) / sludge slurry solution transfer to Tank 51, the tank’s guillotined coils and broken coils [Figure 1] will be flushed with H-Tank Farm facility Well Water (engineering will determine actual volume based on type of coil failure). If sufficient flow cannot be achieved, the cooling coil(s) will be flushed and grouted using the same methodology presented in WSRC-STI-2008-00298. The conceptual plan for flushing will be performed by utilizing existing NPT fittings located on the supply and return piping of the tank top cooling coil system [Figure 2].

Due to aging isolation valves within the Chromate Cooling Water (CCW) System, there are no reliable operational mechanical isolation points. In addition, the CCW system must allow the continued use of chromate water supply to the waste tank ventilation system condenser.

To resolve the Chromate System isolation issue, the recommendation is to avoid actuating the supply and return valves for both the tank and each individual cooling coil. Well water feed to both the supply and return for each cooling coil will utilize existing taps located in the valve house. Flushing will occur when the well water discharges from the guillotine break or leak site back into the tank.

Operational Information/requirements:

The Tank 12 Slurry Pumps and Submersible Transfer Pump will not be in operation during these flushing activities.

It is estimated that the full volume of a single vertical and a single horizontal cooling coil is approximately 120 and 165 gallons, respectively. A total of twenty-seven (27) designated vertical coils and one (1) designated horizontal coil are to be flushed. The statuses of the cooling coils are given on the following page in Table 1.

Table 1: Tank 12 CRW Cooling Coil Status

Coil #	Supply Valves	Supply Blank Installed	Return Valve	Return Blank Installed	Spool Piece Removed	Status
1	Closed	Yes	Closed	Yes	No	Failed
2	Closed	Yes	Closed	Yes	Yes	Failed
3	Closed	No	Closed	No	No	Failed
4	Open	No	Open	No	No	In Service
5	Closed	No	Closed	No	No	Failed
6	Closed	Yes	Closed	Yes	No	Failed
7	Closed	Yes	Closed	Yes	No	Failed
8	Closed	Yes	Closed	Yes	Yes	Failed
9	Closed	Yes	Closed	Yes	Yes	Failed
10	Closed	No	Closed	No	No	Failed
11	Closed	Yes	Closed	Yes	Yes	Failed
12	Closed	Yes	Closed	Yes	Yes	Failed
13	Closed	Yes	Closed	Yes	Yes	Failed
14	Closed	Yes	Closed	Yes	No	Failed
15	Closed	No	Closed	No	No	Failed
16	Closed	No	Closed	No	No	Failed
17	Open	No	Closed	No	No	Standby
18 (Horizontal)	Open	No	Open	No	No	In Service
19	Closed	Yes	Closed	Yes	No	Failed
20	Closed	Yes	Closed	Yes	Yes	Failed
21	Closed	No	Closed	No	No	Failed
22	Open	No	Closed	No	No	Standby
23	Open	No	Open	No	No	In Service
24	Closed	No	Closed	No	No	Failed
25	Closed	Yes	Closed	Yes	Yes	Failed
26	Closed	Yes	Closed	Yes	Yes	Failed
27	Closed	No	Closed	No	No	Failed
28	Closed	Yes	Closed	Yes	No	Failed
29	Closed	Yes	Closed	Yes	Yes	Failed
30	Open	No	Closed	No	No	Standby
31	Open	No	Open	No	No	In Service
32	Open	No	Closed	No	No	Standby
33	Closed	Yes	Closed	Yes	No	Failed
34	Closed	No	Closed	No	No	Failed
35	Closed	No	Closed	No	No	Failed
36 (Horizontal)	Closed	Yes	Closed	Yes	Yes	Failed

The designated failed (cut/broken) cooling coils shall be flushed and/or drained from both sides (supply and return) simultaneously into the primary tank.

The hoses and connections will be flushed into the primary tank after completion of flushing activities of designated cooling coils.

Tank 12 Inspection and Monitoring Requirements:

Video inspection is recommended during the flushing activities to document the evolution and record failed coil locations relative to the level of the waste.

Tank level should be monitored by the Riser 4 reel tape to ensure the liquid level in waste storage tanks shall be less than or equal to the fill limits stated in the ERD (N-ESR-G-00001).

The total gallons of service well water added to the primary tank during the flushing activities will be evaluated in the Data Management Tracking (DMT) system. It is estimated that the total volume of service well water added into the primary tank due to flushing of designated cooling coils and hoses/connections will exceed 3000 gallons.

References:

- 1) LWO-PIT-2007-00021, Revision 0, Defining Technology Attributes Leading To Successful Closure of F-Tank Farm Cooling Coils, May 2007
- 2) M-M6-H-8831, Revision 3, H Area Old Hill TK 12 Chromate Cooling Water System PPG (U), 04/01/2011
- 3) S-TSR-G-00001, Revision 33, Technical Safety Requirements Savannah River Site Concentration, Storage, and Transfer Facilities, LCO 3.8.4, November 2011
- 4) U-ESR-H-00062, Revision 4, Tank 12 Waste Removal Operating Plan, 10/06/2009
- 5) SW9.1-CW(13H)-5.20, Revision 9, Tank 12 Cooling Coil Positioning For Tank Temperature Control, 11/17/2011
- 6) D116001, Revision 10, 200 Area Bldg 241-F&H Bottom Cooling Coils for Waste Storage Tank, 07/21/1955
- 7) D116048, Revision 37, Bldg 241-F&H Vertical Cooling Coils for Waste Storage Tank, 09/08/1955
- 8) WSRC-STI-2008-00298, Revision 0, Closure of HLW Tanks - Phase 2, Full Scale Cooling Coils Grout Fill Demonstrations, 06/23/2008
- 9) S-TSR-G-00001, Revision 38, Concentration, Storage, and Transfer Facilities Technical Safety Requirements, September 2012
- 10) N-ESR-G-00001, Revision 621, High Level Waste Emergency Response Data and Waste Tank Data, 11/12/2012

Contact Information:

<u>Name</u>	<u>Site Phone</u>	<u>Offsite Phone</u>	<u>Pager</u>
S. Jason Worthy	8-1529	(864) 238-0044	21345
Jason. L. Clark	8-0011	(205) 229-1384	12774
John R. Tihey	8-2898	(803) 646-6175	18095
Marybeth Buxton	8-3566	(803) 645-5215	

Distribution:

J. E. Burgin, 241-102F
J. L. Clark, 241-162H
S. R. Faison, 241-156H
W. Hall, Jr., 241-284H
D. G. Harris, 241-162H
D. V. Hicks, 241-162H
M. J. Mahoney, 705-1C
B. A. Stephens, 705-1C
A. J. Tisler, 241-284H



Figure 1: Tank 12 Guillotined and Broken CCW Coils



CCW Supply
NPT Fitting
(Typical)

CCW Return
NPT Fitting
(Typical)

Figure 2: Tank 12 CCW Valve House