Savannah River Remediation
A URS COMPANY TEAMED WITH BECHTEL | CH2M HILL | B&W | AREVA
SAVANNAH RIVER REMEDIATION LLC
We do the right thing.
Savannah River Site, Aiken, SC, 29808

Tanks 5 and 6
Final Configuration Report Inputs

February 19, 2014

SRR-LWE-2013-00227, Rev. 0

Prepared by: _____ Date: 2/19/14
R. O. Voegtlen, Engineer, Closure Engineering

Reviewed by: _____ Date: 2/19/14
G. M. Grim, Engineer, Closure Engineering

Reviewed by: _____ Date: 2/19/14
J. B. McCord, Engineer, URS-PS

WWW.SRREMEDIATION.COM
TEL 803.208.2877
FAX 803.208.8194

Purpose:

The purpose of this document is to gather and record important data from the grouting of Tanks 5 & 6 for future reference. As-found grouting-related deviations from the configuration described in the Closure Module are also included.

Waste Tank System Isolation

The Tanks 5 and 6 were isolated from the F Tank Farm (FTF) Waste Transfer System (WTS) and the FTF support systems.

The Mechanical Isolation is documented in M-TRT-F-00031, Revision 0, "Engineering Report – Tank 5F Closure Mechanical Isolation Matrix" (Reference 28) and M-TRT-F-00032, Revision 0, "Engineering Report – Tank 6F Closure Mechanical Isolation Matrix" (Reference 29). The Electrical Isolation is documented for Tank 5 in E-DCP-F-10009 (Reference 30) and for Tank 6 in E-DCP-F-10010 (Reference 31) as well as other multiple design change documents. For a complete list of electrical isolation designs see Attachment 1 "Tank 5 Electrical Isolation Design Changes" and Attachment 2 "Tank 6 Electrical Isolation Design Changes".

Isolation was performed in accordance with SRR-CWDA-2012-00071, Revision 1, "Industrial Wastewater Closure Module for Liquid Waste Tanks 5F and 6F" (Reference 6), with the exception of the deviations noted later in this report.

Grouting Results Summary

Important Grouting Dates

Grouting of Tanks 5 and 6 began and ended in 2013, with the first in-tank concrete being poured on August 16, 2013 and the final riser completing on December 18, 2013. The important dates associated with this process are included in the Table 1.

Table 1: Tank Grouting Events		
Tank	Event	Date
5	Tank bulk fill begins	8/16/2013
	Tank bulk fill ends	10/29/2013
	Annulus bulk fill begins	8/21/2013
	Annulus bulk fill ends	11/18/2013
	Failed Cooling Coils begins	8/22/2013
	Failed Cooling Coils ends	8/23/2013
	Intact Cooling Coil begins	11/4/2013
	Intact Cooling Coil ends	11/19/2013
	Riser fill begins	12/10/2013
	Riser fill ends	12/12/2013
6	Tank bulk fill begins	8/19/2013
	Tank bulk fill ends	11/13/2013
	Annulus bulk fill begins	8/21/2013
	Annulus bulk fill ends	11/20/2103
	Intact Cooling Coil begins	11/25/2013
	Failed Cooling Coils begins	8/27/2013
	Failed Cooling Coils ends	9/5/2013
	Intact Cooling Coil ends	12/5/2013
	Riser fill begins	12/11/2013
	Riser fill ends	12/18/2013
Source: Operations grouting logs		

Test Cylinders

During grouting, sets of test cylinders were pulled periodically from the concrete being poured into tanks and risers. The requirements for grout sampling and testing can be found in C-SPP-F-00055 "Furnishing and Delivery of Tank Closure Grout" (Reference 3). Test cylinders were required to be pulled on the first batch of the day and one random set from the second 100 cubic yards (CY) delivered. These cylinders would be taken back to labs for curing and testing to determine the compressive strength of the grout used. Seventy-six sets of seven test cylinders were taken during the grouting of Tanks 5 and 6, yielding a total of 532 test cylinders pulled. Of the seven cylinders, two cylinders were tested at seven days, three were tested at twenty-eight days and the remaining two cylinders were placed on "hold" to be tested if requested by SRR. All test cylinders have now been tested. With the average 28-day compressive strength of 2966 psi, all tested cylinders had a

compressive strength greater than the design 28-day compressive strength of 2000 psi.

Grout Placement Sequence

A structural analysis of the stresses anticipated from placement of grout in the primary steels tank was performed (Reference 1). As a result a grout sequence was developed which recommended cycling grouting at specific heights between the tank primary vessel and tank annulus. See Figure 1 for grout sequence.

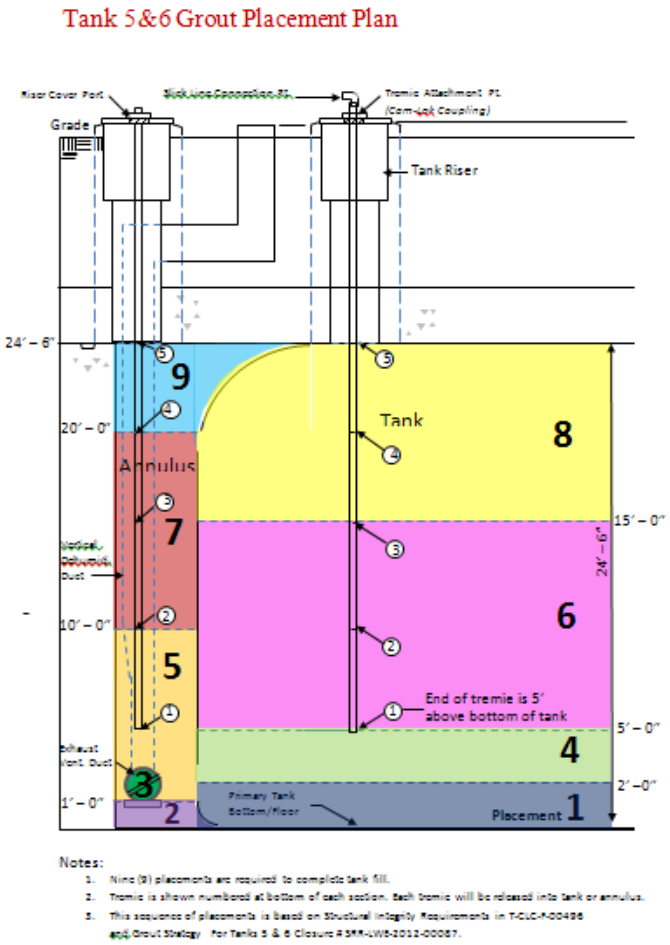

Figure 1: Grout Sequence

Visual Inspections

With regard to primary and annulus grouting, visual inspections for grout characteristics during pour operations and daily pre-operations video inspections were performed in accordance with the video inspection plan (Reference 2). These inspections were performed using video cameras positioned daily in the anticipated

optimal locations to observe the pouring (e.g. nearest riser opening to pouring location). Observed grout characteristics were evaluated against known or anticipated grout attributes. The fresh grout properties (such as flowability, self-leveling, aggregate separation, etc.) were evaluated and observed throughout the grout placement process. Additionally, a comprehensive visual inspection of the grout area was performed prior to placement of grout, midday, and at the conclusion of daily grout activities. The inspections included attributes such as the examination for the presence of large cracks in the dried grout, shrinkage of the dried grout, non-self-leveling of the grout, and the presence of voids. There were no abnormalities or irregularities against the anticipated grout characteristics identified.

Grout Flowability

The ability of the grout to flow was demonstrated during the grouting of Tanks 18 and 19. However, internal tank obstructions and interferences in Tanks 5 and 6 increased the risk of uneven grout distribution. To reduce this risk, a bulk fill grout with a higher slump value was used. The slump flow working range was increased from 24-28 inches to 26-30 inches (see Reference 3). It was visually confirmed that the Tank 5 and 6 obstructions and interferences did not hinder the flow of grout and the entire volume of Tanks 5 and 6 primary and annulus tanks was filled with bulk fill reducing grout.

Tank Bulk Fill Grout Estimates and Results

The actual grout volumes placed (tank, annulus, and risers) are based on the volumes from the batch ticket provided by each grout truck installed (typically 8 CYs per truck).

Tank 5

The estimated volume to fill a Type I tank was calculated as part of U-CLC-G-00001 (Reference 4). The calculation predicts 793,411 gallons (3928.3 cubic yards) per tank and at the top of the tank accounts for the curvature of the tank by estimating the volume using a chamfer estimate. To better represent the tank and more accurately predict the volume, the top chamfer was replaced with the estimate of the top and bottom knuckle curvatures. The volume of residual material in Tank 5 is estimated to be 1,900 gallons (source: References 5 and 6). The resulting estimated volume to fill Tank 5 is 793,182 gallons (3927 cubic yards).

According to Operations logs (confirmed with WO 01199252-30, Reference 7), 3871 cubic yards of actual grout were required for the bulk filling of Tank 5.

Tank 6
The estimated volume to fill a Type I tank was calculated as part of U-CLC-G-00001 (Reference 4). The calculation predicts 793,411 gallons (3928.3 cubic yards) per tank and at the top of the tank accounts for the curvature of the tank by estimating the volume using a chamfer estimate. To better represent the tank and more accurately predict the volume, the top chamfer was replaced with the estimate of the top and bottom knuckle curvatures. The volume of residual material in Tank 6 is estimated to be 3,000 gallons (References 6 and 8). The resulting estimated volume to fill Tank 6 is 792,082 gallons (3922 cubic yards).

According to Operations logs (confirmed with WO 01199254-18, Reference 9), 3849 cubic yards of actual grout were required for the bulk filling of Tank 6.

Annulus Bulk Fill Grout Estimates and Results
The estimated volume to fill a Type I tank annulus was calculated as part of U-CLC-G-00001 (Reference 4). The calculation predicts an annulus volume of 111,549 gallons. To refine this value, the volume of top and bottom knuckles (tank curvature) of 6,104 gallons was included. This volume was estimated based on a dimensional drawing (Reference 10). This resulted in 117,653 gallons (583 cubic yards) to fill a Type I tank annulus. (Note: this total excludes the risers and is intended to be conservative on the high side)

According to Operations logs (confirmed with WO 01199252-30 (Reference 7) and WO 01199254-18(Reference 9)), 123,608 gallons (612 cubic yards) of actual grout were required for the annulus bulk filling of Tank 5, while 121,386 gallons (601 cubic yards) were used for the annulus bulk filling of Tank 6.

Through the annulus air inlet riser, grout was introduced to annulus ventilation duct with the intent to minimize air pockets. Through visual observation of the annulus duct registers at multiple locations, grout was observed internally filling the annulus duct. Camera inspections also showed annulus bulk fill grout flowing into some duct registers.

Riser Bulk Fill Grout Estimates and Results
All risers were successfully filled with bulk grout to the bottom of the top riser cover/plate, above the grade level.

The estimated volume to fill the risers is 8685 gallons (43 cubic yards) per tank. The volume was based on dimensional drawings (See References 11 and 12).

According to Operations logs, 7,271 gallons (36 cubic yards) of actual grout were required for the bulk filling of Tank 5 risers, while 6160 gallons (30.5 cubic yards) were used for the bulk filling of Tank 6 risers.

Summary of Estimated Verses Actual Grout Placed Volumes

Table 3: Estimated vs. Actual Grout Volumes for Tank 5		
Tank 5	Estimated (CY)	Actual (CY)
Total Tank 5 w/o Risers	3927	3871
Total Tank 5 Annulus w/o Risers	583	612
Total Tank 5 Risers	43	36
Total Tank 5	4553	4519

Table 4: Estimated vs. Actual Grout Volumes for Tank 6		
Tank 6	Estimated (CY)	Actual (CY)
Total Tank 6 w/o Risers	3922	3849
Total Tank 6 Annulus w/o Risers	583	601
Total Tank 6 Risers	43	30.5
Total Tank 6	4548	4480.5

Failed Cooling Coil Grouting

Failed cooling coils, coils with a guillotine failure, were grouted successfully from each end (inlet and outlet) as per the requirements of the Grout Strategy (See Reference 13). Tank 5 had seven failed coils, while Tank 6 had nine failed coils. See Reference 18 for further details.

Intact Cooling Coil Fill Grout Estimates and Results

The actual grout volumes placed in the intact cooling coils are based on readings obtained from an in-line flow meter located on the grout addition line.

Tank 5

The estimated volume to fill the intact cooling coils in Tank 5 was 3,151 gallons (15.6 cubic yards) per WO 01199252-53 (Reference 14).

According to Operations logs (confirmed with WO 01199252-53(Reference 14)), 2,949 gallons (14.6 cubic yards) of actual grout was used for the bulk filling of Tank 5 intact cooling coils.

Tank 6
The estimated volume to fill the intact cooling coils in Tank 6 was 2,969 gallons (14.7 cubic yards) per WO 01199254-62 (Reference 15).

According to Operations logs (confirmed with WO 01199254-62 (Reference 15)), 2,706 gallons (13.4 cubic yards) of actual grout was used for the bulk filling of Tank 6 intact cooling coils.

Equipment Fill Grout Estimates and Results
Grout was supplied to the equipment in a slow deliberate manner allowing the equipment to self-vent, with the intent to reduce the likelihood of the formation of air pockets. When required, special tools (such as angled grout addition lines and a hand-pump) were used to meet the unique challenges associated with equipment grouting. The equipment grout was placed using buckets of a known volume. The actual grout volumes placed in the equipment are based on the total volume of the buckets poured.

Engineering estimated the volume of remaining in-tank equipment. The volumes were based on dimensional drawings referenced below. Table 5 summarizes both these initial estimates as well as the actual grouting results as recorded in the equipment fill work packages WO 01199252-46 (Reference 16) (Tank 5) and WO 01199254-58 (Reference 17) (Tank 6).

Table 5: Estimated vs. Actual Grout Volumes for Tanks 5 & 6 In-Tank Equipment							
Tank	Riser	Equipment	In Closure Module?	Estimated Grout Volume (Gallons)	Reference	Actual Grout Volume (Gallons)	Reference
5	6	Submersible Transfer Pump (STP)	Y	13.4	P-PA-F-3480 (Ref. 19)	11 Note 3	WO 01199252-46 Step 4.13
5	6	Thermowell	Y	1.6	P-PA-F-3481 (Ref. 20)	2 Note 3	WO 01199252-46 Step 4.13
6	6	Submersible Transfer Pump (STP)	Y	13.4	P-PA-F-3546 (Ref. 21)	11 Note 3	WO 01199254-58 Step 4.13
6	6	Thermowell	Y	1.6	P-PA-F-3547 (Ref. 22)	2 Note 3	WO 01199254-58 Step 4.13
6	4	Transfer Jet – Steam Inlet	Y – Note 1	1.5	S5-2-4861 S5-2-7227 (Refs. 23 & 24)	2	WO 01199254-58 Step 4.26
6	4	Transfer Jet - Discharge	Y – Note 1	8	S5-2-4861 S5-2-7227 (Refs. 23 & 24)	10	WO 01199254-58 Step 4.27
6	4	Thermowell	N	1.5	Note 2	1.5	WO 01199254-58 Step 4.25
Note 1 – Initially, the transfer jet was not to be grouted. See Reference 18 for details.							
Note 2- Conservatively estimated to be 35 feet long, 1 inch diameter pipe – cut into two pieces.							
Note 3- Work Orders 01199252-46 Step 4.13 and 01199254-58 Step 4.13 lists 13 gallons. Based on field interviews eleven was placed in the STP and 2 gallons in the thermowell.							

Deviations from Closure Module

The following deviations or differences between the final configuration of Tanks 5 and 6 and those identified in the Closure Module (SRR-CWDA-2012-00071, Reference 6) were noted. All Section and Table numbers refer to where in the Closure Module the comparison information can be found.

General

- SRR-CWDA-2012-00071 (Reference 6) Section 7.1.1 "Tank 5F System Isolation" states "Additional details on the isolation plans for Tank 5F systems from the FTF WTS and support systems can be found in the Tank 5F closure isolation strategy. [M-CTP-F-00005]." (See Reference 26) Likewise,

for Tank 6 SRR-CWDA-2012-00071 (Reference 6) Section 7.1.2 "Tank 6F System Isolation" states "Additional details on the isolation plans for Tank 6F systems from the FTF WTS and support systems can be found in the Tank 6F closure isolation strategy. [M-CTP-F-00006]." (See Reference 27) There are three places where the aforementioned Isolation Strategies are not fully met.

a) The Isolation Strategies (References 26 and 27) Section 3.0 "Strategy", "Configuration Management", "Isolation Points" states "Isolation Points: A mechanical and electrical isolation matrix was developed (and is maintained in SRS Document Control), the …". However, only a stand-alone the Mechanical Isolation Matrix was developed (See References 28 and 29). The electrical isolation was performed under a Design Change Package (DCP) or a Design Change Form (DCF) per the requirements of the plan; however a consolidated electrical isolation matrix was not developed. See Attachment 1 and 2 for a list of isolation DCPs and DCFs associated with Tanks 5 and 6.

b) Per the Isolation Strategies (References 26 and 27) Attachment 1: "Isolation", "Heating and Ventilation (H&V) System:" "The second phase will remove all tank top H&V equipment including instrumentation and roll-back of all associated electrical and instrument lines." However, contrary to this, not all tank top H&V equipment has been removed. For example, though disconnected from the tank and isolated, the Tank 5 annulus inlet HEPA housing remains on the tank top. While not complying with the exact requirement, the intent to isolate the H&V equipment was met.

c) Per the Isolation Strategies (References 26 and 27) Attachment 1: "Isolation", several system isolations identify isolation points at specific valves. However, contrary to this isolation was performed downstream of the specified valve. For example, the isolation strategy for Tank 5 (Reference 26) states isolation of the Bearing Water System will be performed by "cutting and capping the header at valve BW-V-36." The Tank 5 Mechanical Isolation Matrix (Reference 28) states the actual isolation was performed "Downstream of valve FL-241905-BW-V-36 in Line 2"-BW-12602-P53A." Though not fully compliant, this meets the intent of the strategy.

- SRR-CWDA-2012-00071 (Reference 6) Section 7.3.4 "Cooling Coil Grouting" states "The two horizontal cooling coils and all remaining vertical cooling coils will be grouted after …" - This is in reference to remaining intact coils and infers fully grouted to the extent practical. Fifty-six of the seventy-two were designated as intact. Of the fifty-six, fifty-one were fully grouted, with

the remaining five partially filled due to complications encountered during the coil grouting evolution. See Reference 18 for further details.

Risers

- SRR-CWDA-2012-00071 (Reference 6); states "Riser capping will be performed to isolate risers and structures protruding from a riser." Since there were no structures extending from a riser, capping of any riser beyond the grade level was not required and therefore not performed. All the risers were filled to the grade level (i.e. filled to the bottom of the top riser cover/plate, above the grade level) which was sufficient to meet the intent of this requirement.

Tank 6

- SRR-CWDA-2012-00071 (Reference 6) Figure 7.1-2 "Tank 6F Risers and Transfer Line Location" and Table 7.2-2 "Equipment to Remain in Tank 6F" identified the transfer jet in Tank 6 Riser 4 as disassembled and suspended in the riser. Contrary to this the jet was discovered intact. C&WDA was notified and subsequently the transfer jet assemblies were grouted. See Reference 18 for further details.

- SRR-CWDA-2012-00071 (Reference 6) Figure 7.1-2 "Tank 6F Risers and Transfer Line Location" and Table 7.2-2 "Equipment to Remain in Tank 6F" did not list a thermocouple well (thermowell) assembly in the Tank 6 Riser 4. Contrary to this, a disassembled thermocouple well was identified. C&WDA was notified and subsequently the disassembled thermocouple well assemblies were grouted. See Reference 18 for further details.

Unreviewed Waste Management Question (UWMQ)
The implementation of Manual S4, Procedure ENG.46 "LW Unreviewed Waste Management Question (UWMQ)" (See Reference 25) resulted in five Unreviewed Waste Management Question Evaluations (UWMQE):

1. TRC-FTF-2012-00009 "Proposed Activity – Approval and Use of ETGS Invisible Blue Contamination Encapsulation Agent in Waste Tanks after Residual Sampling has begun" (See Reference 32)

2. TRC-FTF-2012-00013 "Proposed Activity – Approval and Use of Spartan Chemical Company Product SC-200 During the Removal of the Submersible

Mixer Pumps in Tank 6 after Residual Sampling has occurred" (See Reference 33)

3. TRC-FTF-2013-00001 "Proposed Activity - Chromate Cooling Water Entering Tanks 5 and 6 During the Process of Flushing the Cooling Coils" (See Reference 34)

4. USQ-FTF-2013-00317 "New Data - Failure to Meet the Requirements of Grout Fill Formulation Specification Water Volume" See Reference 35)

5. USQ-FTF-2013-00320 "New Data – Failure to Meet the Requirements of Grout Fill Formulation Specification on Several Grout Test Cylinders" See Reference 36)

These evaluations concluded that the activities were consistent with the existing Waste Determination (WD).

References:

1. T-CLC-F-00496, Revision 0, "Closure Grouting for Type I Tanks 5 and 6"
2. SRR-LWE-2013-00008, Revision 0, "Video Inspection Plan for Tanks 5 and 6 During Tank Grouting Activities"
3. C-SPP-F-00055, Revision 4, "Furnishing and Delivery of Tank Closure Grout"
4. U-CLC-G-00001, Revision 1, "Total Fill Volumes of High Level Waste Tanks"
5. U-ESR-F-00048, Revision 0, "Tank 5 Final Volume Determination and Uncertainty Estimate Report"
6. SRR-CWDA-2012-00071, Revision 1, "Industrial Wastewater Closure Module for the Liquid Waste Tanks 5F and 6F"
7. Work Order 01199252-30 "Tank 5 Grout Placement"
8. SRR-LWE-2011-00245, Revision 2, "Tank 6 Final Volume Determination and Uncertainty Estimate"
9. Work Order 01199254-18 "Tank 6 Grout Placement"
10. W145379 Revision 4, "Waste Storage Tanks 241 F & H 75'-0" Dia. Steel Tank Details Steel (U)"
11. W149522, Revision 92, "200 Area Waste Storage Tanks, Riser & Plug Details Concrete & Steel Process (U)"
12. W146593, Revision 49, "Dehumidification System Heating and Ventilation (U)"
13. SRR-LWE-2012-00087, Revision 2, "Grout Strategy for Tanks 5 and 6 Closure"
14. Work Order 01199252-53 "Tank 5 Grout Operable Cooling Coils in Valve House"
15. Work Order 01199254-62 "Tank 6 Grout Operable Cooling Coils in Tank 6 Valve House"
16. Work Order 01199252-46 "Tank 5 Grout Placement STP Equipment"
17. Work Order 01199254-58 "Tank 6 Grout Placement STP Equipment"
18. SRR-LWE-2013-00214, Revision 0, "Engineering Path Forward – Tanks 5 & 6: Record of Additional Grouting Actions"
19. P-PA-F-3480, Revision 1, "Tank 5 Transfer Pump Installation Details, Sheet 1 of 3"
20. P-PA-F-3481, Revision 1, "Tank 5 Transfer Pump Installation Details, Sheet 2 of 3"
21. P-PA-F-3546, Revision 0, "Tank 6 Transfer Pump Installation Details, Sheet 1 of 3"
22. P-PA-F-3547, Revision 0, "Tank 6 Transfer Pump Installation Details, Sheet 2 of 3"
23. S5-2-4861, Revision 3, "Waste Storage Tank No. 6 Supernate Transfer Jet Sections and Details (U)"
24. S5-2-7227, Revision 7, "Steam Line Installation, Jet and Plug Details, Sheet 1"
25. S4-ENG.46, Revision 2, "LW Unreviewed Waste Management Question (UWMQ)"

26. M-CTP-F-00005, Revision 0, "Tank 5F Isolation Strategy"
27. M-CTP-F-00006, Revision 1, "Tank 6F Isolation Strategy"
28. M-TRT-F-00031, Revision 0, "Engineering Report - Tank 5F Closure Mechanical Isolation Matrix"
29. M-TRT-F-00032, Revision 0, "Engineering Report - Tank 6F Closure Mechanical Isolation Matrix"
30. E-DCP-F-10009, Revision 0, "Tank 5 Electrical Isolation"
31. E-DCP-F-10010, Revision 0, "Tank 06 Electrical Isolation"
32. TRC-FTF-2012-00009, Revision 0, "Approval and Use of ETGS Invisible Blue Contamination Encapsulation Agent in Waste Tanks after the Residual Sampling has begun"
33. TRC-FTF-2012-00013, Revision 0, "Approval and Use of Spartan Chemical Company Product SC-200 During the Removal of the Submersible Mixer Pumps in Tank 6 after Residual Sampling has occurred"
34. TRC-FTF-2013-00001, Revision 0, "Proposed Activity – UWMQE Approval of Chromate Cooling Water entering Tanks 5 and 6 During the Process of Flushing Cooling Coils"
35. USQ-FTF-2013-00317, Revision 0, "New Data – Use-As-Is Disposition of the Non-Conformance Report (NCR) 2013-NCR-15-WFC-0006 "F Tank Farm Grout – Tank 6" Non-Conformance Tank 6 Grout Water Content Higher than Allowed per C-SPP-F-00055, Rev. 4 "Furnishing and Delivery of Tank Closure Grout"
36. USQ-FTF-2013-00320, Revision 0, "New Data – Use-As-Is Disposition of the Non-Conformance Report (NCR) 2013-NCR-15-WFC-0007 "F-Tank Farm Grout – Tank 5 and 6". Non-Conformance Tanks 5 and 6 Grout Test Cylinders Deviation from Requirements of C-SPP-F-00055, Rev. 4 "Furnishing and Delivery of Tank Closure Grout"

Attachment 1:

Tank 5 Electrical Isolation Design Changes

DCP Number	Status	Title	Electrical Scope
E-DCP-F-10009	Field Installed 4/26/2011	TK-5 Electrical Isolation	Covers the miscellaneous electrical isolation of Tank 5 for items not covered by other scope identified below. Pages 8-10 of the DCP provide a listing of the specific scope and equipment de-energized.
M-DCP-F-10017	Field Installed 4/21/2011	Tank 5F Closure Mechanical Isolation	Heat trace on process lines.
E-DCF-F-03015	Field Installed 2/15/2011	Tank 5 STP Motor Remove From Service	Tank 5 STP Motor Isolation
E-DCF-F-03048	Field Installed 10/8/2012	Tank 5F HVAC Electrical Isolation	Disconnect and remove annulus and purge ventilation electrical equipment and conductors as applicable. Specific equipment is listed on pages 2-3 of the DCF.
J-DCF-F-01152	Field Installed 10/18/2012	Tank 5F HVAC I&C Electrical Isolation	Electrical instrumentation isolation for Tank 5F HV purge system for purge and annulus inlet and exhaust systems. The impacted CLIs are listed on page 4 of the DCF and the scope is listed on pages 2-3.
E-DCF-F-03122	Field Installed 2/22/2012	Tank 5 "As Built" Isolation Update	Miscellaneous drawing updates to reflect "As Found" field conditions. The cover page of the DCP lists the impacts drawings and equipment.
E-DCF-F-03159	Field Installed 2/26/2013	Removal Of Tank 5 Steel Wall Temperature Loops	Impacted equipment includes the Tank 5 temperature loop panel, instrument power and thermocouples. See page 2 of the DCF for further information.
J-DCP-F-12002	Field Installed 5/14/2013	Tank 5 HLLCP Removal	Isolation of the Tank 5 HLLCP.
J-DCF-F-01193	Field Installed 5/30/2012	As-Built Terminal Block Installation: Control Room 1F PANEL 480.4A	Identification of previously unidentified power source.

Attachment 2:

Tank 6 Electrical Isolation Design Changes

DCP Number	Status	Title	Electrical Scope
E-DCP-F-10010	Field Installed 4/26/2011	Tank 06 Electrical Isolation	Covers the miscellaneous electrical isolation of Tank 6 for items not covered by other scope identified below. Pages 8-10 of the DCP provide a listing of the specific scope and equipment de-energized.
E-DCF-F-03186	Field Installed 4/1/2013	Tank 6 Annulus Fan Electrical Isolation	Isolation of Annulus Fan, Annulus High/Low Differential Pressure Loop, and Annulus High Differential Pressure Indicator/Switch. Impacted CLIs and isolation points are identified on page 5 of the DCP.
E-DCF-F-03123	Field Installed 2/22/2012	Tank 6 "As Built" Isolation Update	Miscellaneous drawing updates to reflect "As Found" field conditions. The cover page of the DCP lists the impacts drawings and equipment.
J-DCF-F-01154	Field Installed 2/20/2013	Tank 6 Isolation Set Point Update	Revises drawings to reflect removal of LE-8506 and LE-8507. Additional miscellaneous alarm diagram changes based on as found conditions.
E-DCF-F-03046	Field Installed 8/25/2011	Tank 6 MWRCC Electrical Isolation	D&R unnecessary/unused cabling, instrumentation, and Junction Boxes affiliated with MWRCC equipment located in Tank 6 Risers 1, 3, 6, and 8. Specific impacted equipment is identified on pages 2-4 of the DCF.
M-DCP-F-10020	Field Installed 4/21/2011	Tank 6F Closure Mechanical Isolation	Bearing water and Inhibited water heat trace isolation.
E-DCF-F-03018	Field Installed 2/15/2011	Tank 6 STP Electrical Isolation Matrix Remove From Service (RFS)	Tank 6 STP Motor Isolation. Specific impacted equipment and isolation points are identified on pages 14-15 of the DCF.
E-DCF-F-03160	Field Installed 2/27/2013	Isolate Tank 6 Thermocouples	This DCF removes the Tank 6 Steel Wall and Riser 5 Temperature Instruments/Alarms. Impacted equipment and isolation points can be found on page 5 of the DCF.
J-DCP-F-12003	Field Installed 5/1/2013	Tank 6 HLLCP Removal	Tank 6 HLLCP Removal. Impacted equipment and isolation points can be found on page 4 of the DCP.
J-DCF-F-01132	Field Installed 4/7/2011	D&R Tank 6 Riser 5	Removal of Tank 6 Reel Tape and supporting equipment.