



U.S. Department of Energy
~~Office of River Protection~~

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JUN 27 2006

06-TED-047

Mr. Denny Ferrera
Chief Operating Officer
CH2M HILL Hanford Group, Inc.
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Richland, Washington 99354

Dear Mr. Ferrera:

CONTRACT NO. DE-AC27-99RL14047 – ASSESSMENT REPORT A-06-AMTF-TANKFARM-005, TANK FARM CONTRACTOR (TFC) PROJECT W-314 AN/AW EXHAUSTER SKID ASSESSMENT

This letter transmits the results of the U.S. Department of Energy (DOE), Office of River Protection (ORP), assessment of the TFC Project W-314 AN/AW Exhauster Skids. The assessment was completed on June 29, 2006.

The objectives of the assessment are to:

- Identify current exhauster skid status since W-314 ramp down;
- Identify and verify ongoing maintenance activities that prevents system degradation prior to use;
- Verify availability and actions required for exhauster skid tie-in; and
- Perform oversight of TFC Double Shell Tank (DST) Primary Ventilation System Assessment to be performed in June 2006.

The ORP assessment team concluded that there are several weaknesses in the overall care and custody of the W-314 AN/AW exhauster skids. Should the weaknesses be corrected, the corrections would ensure minimal degradation of the skids and not result in irreversible damage. The team identified no Findings and six Observations.

If you have any questions, please contact me, or your staff may contact Mr. Dennis H. Irby, Tank Engineering Division, Assessment Team Lead, (509) 376-5652.

Sincerely,

T. Zack Smith, Assistant Manager
for Tank Farms Project

TED:GLJ

Attachment

cc: See page 2

**U.S. Department of Energy
Office of River Protection**

**Tank Farm Contractor
Project W-314 AN/AW Exhauster Skid
Assessment**

Final Report
A-06-ASTM-TANKFARM-005

July 2006



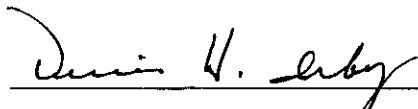
Office of River Protection

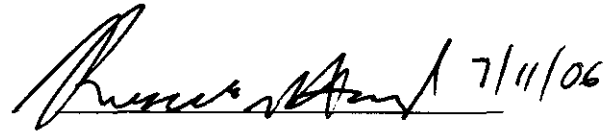
Dennis H. Irby
Team Leader

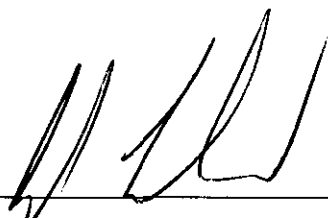
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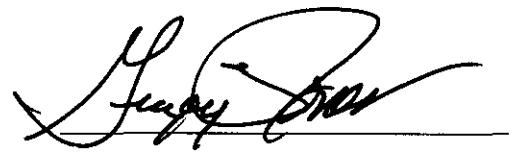
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EXECUTIVE SUMMARY

An assessment of the U.S. Department of Energy (DOE), Office of River Protection (ORP) Tank Farm Contractor (TFC) Project W-314 AN/AW Exhauster (W-314) status was performed by ORP from June 19 through 23, 2006. The objectives of the assessment are to:

- Identify current exhauster skid status since W-314 ramp down;
- Identify and verify ongoing maintenance activities that prevents system degradation prior to use;
- Verify availability and actions required for exhauster skid tie-in; and
- Perform oversight of TFC Double Shell Tank (DST) Primary Ventilation System Assessment to be performed in June 2006.

Conclusion

The assessment team concluded that although there are several weaknesses in the overall care and custody of the W-314 AN/AW exhauster skids, that if the weaknesses are corrected, the corrections would ensure minimal degradation of the skids and not result in irreversible damage. It should be noted that continued testing (operational test) is required prior to startup which should identify any damaged or degraded components. When W-314 was delayed (June 2005), the TFC Project Turnover Process did not cover turnover of the new AN/AW exhauster skids for maintenance care and custody. The current W-314 system status as defined by the TFC is “Interim Care and Custody (ICC).” Lacking this turnover, the ICC of the AN/AW exhauster skids was not formally defined which led to inconsistent maintenance implementation and potential degradation of equipment. The W-314 project draft schedule baseline has operational startup of the AN exhauster skid in Fiscal Year (FY) 2009 and AW exhauster skid in FY2010. Given several years to operational startup, availability of the system was not addressed by this assessment as originally scoped. The assessment team concluded that the TFC Vital Safety System (VSS) assessment of the Double Shell Tank Ventilation Systems performed by the TFC during June 2006 was adequate in addressing the availability of the 241-AN, 241-AW, 241-AY and 241-AZ tank farm primary ventilation systems and ascertaining their ability to operate reliably on a continuing basis for the remaining service life.

This assessment resulted in no Findings and six Observations:

Observations

- **A-06-AMTF-TANKFARM-005-O01** – Existing equipment degradation or potential degradation warrants evaluation prior to system testing
- **A-06-AMTF-TANKFARM-005-O02** – When Project W-314 was delayed, the Project Turnover process did not address turnover of the new AN/AW exhauster skids for Interim Care and Custody.

- **A-06-AMTF-TANKFARM-005-O03**—Electrical panelboard schedules were not issued as facility status drawings and physically installed in the AW (AN was not verified) electrical panels in accordance with TFC-ENG-FAC SUP-C-09, *Control of Electrical Panelboard Schedules*.
- **A-06-AMTF-TANKFARM-005-O04**— No objective evidence was provided to support the position that the Seal Pots were drained and purged
- **A-06-AMTF-TANKFARM-005-O05** – The Winterization Program is not effectively implemented for the AN/AW new ventilation skids.
- **A-06-AMTF-TANKFARM-005-O06** – The surveillance program for the AN/AW new ventilation skids is not comprehensively and effectively implemented.

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ACRONYMS

AC - Air Conditioners.....	3
AN - 241-AN Tank Farm.....	4
AW - 241-AW Tank Farm.....	4
CO - Closure Operations.....	6
CRAD - Criteria Review and Approach Document	1
DEAR - Department of Energy Acquisition Regulation	3
DOE - Department of Energy	1
dP - Differential Pressure.....	30
DST - Double Shell Tank	1
F - Fahrenheit.....	5
FY - Fiscal Year.....	6
ICC - Interim Care and Custody	2
MEL - Master Equipment List.....	7
NEC - National Electric Code.....	7
O/S - Out-Of-Service	9
ORP - Office of River Protection.....	1
PEL - Project Equipment List.....	13
PER - Problem Evaluation Request	4
PM - Preventative Maintenance Data Sheet	5
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1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of River Protection (ORP) performed an assessment of the Tank Farm Contractor (TFC) Project W-314 AN/AW Exhauster (W-314) status from June 19 through 23, 2006. In addition, the assessment team performed an oversight of the TFC performance of a Vital Safety System (VSS) assessment of Double Shell Tank (DST) primary ventilation systems.

2.0 PURPOSE AND SCOPE

The purpose of this assessment is to identify the current status of maintenance, surveillance, tagging/labeling, availability of the 241-AN/AW new exhauster skids since Project W-314 ramp down, and perform an overview of the TFC assessment.

The objectives of the assessment are to:

- Identify current exhauster skid status since W-314 ramp down;
- Identify and verify ongoing maintenance activities that prevents system degradation prior to use;
- Verify availability and actions required for exhauster skid tie-in; and
- Perform oversight of TFC DST Ventilation System Assessment to be performed in June 2006.

3.0 APPROACH AND DELIVERABLES

The assessment team performed the review consistent with ORP M 220.1, "Integrated Assessment Program. (DOE 2006)"

Major assessment activities consisted of:

- Preparation of the Criteria Review and Approach Documents (CRAD);
- Selection of the assessment team;
- Pre-review activities;
- Entrance Meeting with the TFC;
- Fieldwork activities;
- Development of the assessment results;
- Exit Meeting with the TFC; and
- Development of a final report, including a factual accuracy review by the TFC.

The assessment team developed the CRADs from the *Model Assessment Criteria and Guidelines for Performing Phase II Assessments of Safety Systems at Defense Nuclear Facilities* (DOE 2001) and TFC procedures. Appendix A provides the CRADs for this assessment.

The ORP selected the assessment team based on technical expertise and experience. Appendix B provides the biographical summaries for each of the team members.

The assessment team conducted the entrance briefing on June 19, 2006. The assessment team performed fieldwork between June 20 through 23, 2006. Fieldwork consisted of TFC staff interviews and AN/AW new exhauster inspections. Team members discussed assessment activities and results periodically and communicated the issues to the TFC point-of-contact. Communication of program strengths, weaknesses, and TFC feedback related to requested information or resolution of issues occurred in real time. The assessment team held the exit briefing on June 29, 2006.

4.0 ASSESSMENT RESULTS

A summary of the results of the assessment, including observations, by assessment performance objective is provided below. Appendix A provides detailed discussions, references, personnel interviewed, and additional considerations.

4.1 Performance Objective –241-AN/AW New Exhauster Skid Current Status

The purpose of this objective required identifying the current status of maintenance, surveillance and availability of the 241-AN/AW new exhauster skids since Project W-314 ramp down.

The performance criteria for evaluating this objective included:

1. Are applicable 241-AN/AW new exhauster skids maintenance and surveillance requirements identified to preclude system degradation and ensure availability?

Assessment Results

The TFC provided an informal operating status of the AN/AW new exhauster skids. The TFC considers the operating status as Interim Care and Custody (ICC). During this “interim time period,” the TFC has defined ICC as “those reasonable actions:

- As defined in the Project Turnover Document (PTD);
- Based on technical considerations and length of time that the system or component will be in ICC;
 - To protect the system from loss or damage; and

- To prevent system degradation from environmental conditions.”

The TFC evaluated the maintenance actions necessary for ICC. The resultant actions are:

- Place cap on stack that can breathe to prevent pressure build up and pest intrusion
- Seal Pot drain and purge complete for AN/AW
- Winterization has been performed since units were placed in farms (heater and heat trace on)
- Air conditioner on in hot weather
- Rotate shaft monthly
- Continue to utilize Winterization procedure
- Leave power to Air Conditioners (AC) and heaters on and allow to operate appropriately.

The assessment team agreed the proposed actions are sufficient to protect the AN/AW exhausters from overall damage. During equipment walk-downs some equipment degradation was noticed (e.g., torn insulation, rusted bolts, dust in cabinets, vinyl conduit was blistered). The equipment will not be utilized for several years. Based on draft schedules and budgets, surveillance is only being performed on selected components, the operational condition of the remainder of the equipment is unknown. During interviews it was recognized that the TFC was assuming that replacement of certain equipment (e.g., Variable Frequency Drive, Programmable Logic Controller system software upgrades, etc.) may be required as functional testing during the ICC period was not practical or technically recommended.

2. Are the 241-AN/AW new exhauster skids procedures implemented and documented to ensure the surveillance and maintenance requirements?

Assessment Results

Given the definition of ICC above, and the maintenance actions necessary for ICC, which is not a formally recognized condition of equipment status, the following lines of inquiry are applicable.

- Who is the custodian for the new AN/AW ventilation skids during ICC?

The skids are physically located within the boundaries of AN and AW farms. Therefore, the custodian is Waste Feed Operations (WFO).

- What is the operating condition and status of the AN/AW ventilation skids?

The defined maintenance actions for ICC and status are provided below:

- Place cap on stack that can breathe to prevent pressure build up and pest intrusion

Work Packages WFO-WO-06-001302 for AN farm and WFO-WO-05-002006 for AW farm are “Ready for Planning” to cap stacks. The required due dates are 6/21/06 and 8/29/06 respectively.

- Seal Pot drain and purge complete for AN/AW

Interviews with personnel indicate that construction performed the drain and purge and that the valves are closed and locked. The two work packages for the acceptance tests are 2E-03-01608 for AW and 2E-03-00989 for AN. The acceptance reports do not document whether the seal pots were drained and purged. Walkdown identified the seal pot valves to be in the closed position. However documented evidence of draining and purging could not be produced for this assessment.

- Winterization has been performed since units were placed in farms (heater and heat trace on)

The winterization program for the AN/AW new exhauster is defined in 3-MISC-126, *Tank Farms Weekly Check of Heater and Heat Trace* as implemented by preventative maintenance ET-07384 (AN) and ET-07939 (AW). Operating procedure TO-040-740, *Perform Routine Surveillance of Winterized Buildings and Equipment for East Tank Farms* performs duplicative surveillances of the heaters on the AN/AW skids. These are all weekly surveillances. In addition, procedure 3-MISC-363, *Winterization/De-Winterization Tank Farms*, implemented by ET-07940, performs a once a year check that the heaters are off and the AC are on. The process requires that any deficiencies noted in the surveillances be documented and corrected. The assessment team identified several issues based on review of these procedures and data sheets. The issues include:

- Problem Evaluation Request (PER)-2005-4184 originated December 15, 2005 identified similar ineffective implementation and captured the issues very well. However, there continue to be issues associated with the implementation from October 2005 through March 2006.

- There are inconsistent acceptance criteria given in the three procedures (e.g., “ensure operable and on or >32 degrees Fahrenheit (F),”)
- The time of day for the heater/heat tape surveillances may potentially not determine operability of the heaters/heat tape (if the heat tape is showing > 5 degrees F over ambient and ambient is -20 degrees F then the heat tape is below freezing.)
- There are inconsistent responses for the same weekly check of the same equipment (e.g., one data sheet says “Y” another says “N” and yet another says “n/a” or “O/S”)
- There are over 110 individual pieces of equipment listed in work package 2E-04-02105 that captures several “years” of deficiencies from winterization surveillances. To date this package is “In Planning” and has not been worked.
- Air conditioner on in hot weather

There is only one check each March (per procedure 3-MISC-363) to ensure the air conditioners for the AN/AW new ventilation skids are operable/operating. There are no other surveillances for the rest of the summer months and no acceptance criteria to determine operable/operating.
- Rotate shaft monthly

The assessment team requested documented evidence of rotating the shaft monthly. The TFC did not have a monthly preventative maintenance package to rotate the shaft monthly. As a result of the assessment, an update to Preventative Maintenance Data Sheet (PM) ET-05488, General Monthly Exhaust Fan Inspection was issued for the AN/AW exhauster skids on 6/26/06.
- Continue to utilize Winterization procedure

The assessment team reviewed the root cause analysis of PER-2005-4184. Although the root cause dealt with exposed transfer lines during freezing weather, one of the contributing causes was the identification of a weakness in the overall winterization program. From the root cause analysis the TFC identified the following contributing cause:

 - “Contributing Cause 01: Winterization Plan weaknesses inhibited the effective implementation of the winterization program. The assessment of the winterization program noted several concerns with how WFO implemented the

program, but also noted several weaknesses with the design and effectiveness of the plan.

An End Point Effectiveness Assessment will be performed in late October 2006 with the results presented to the TFC Executive Safety Review Board that addresses the following:

- Verification of completion of actions.
- Verification that WFO/Closure Operations (CO)/Facility Manager are implementing program.
- Verification of implementation and utilization of turn over process.

The assessment team agrees with the programmatic issues raised in the root cause analysis and associated corrective actions.

- Leave power to ACs and heaters on and allow to operate appropriately.

The corrective actions identified above associated with PER 2005-4184 should ensure the power to the skids is on and will operate appropriately.

TFC-PLN-04 references procedure TFC-BSM-FPM_MC-C-01, *Material Receipt, Storage, Issuance, Return and Excess Control*. The purpose and scope of this procedure outlines the process for, "Receipt, handling, storage and issuance of construction material for completed, canceled or suspended projects." Specifically, Section 4.5, item 1 states, "Determine if the project "Will be cancelled or delayed/suspended 90 calendar days or more" go to item 2. Item 2 states, "If the project equipment/material is installed in the tank farm but has not been through formal acceptance, refer to TFC-PRJ-SUT-C-06 for disposition of the material and exit this procedure.

Procedure TFC-PRJ-SUT-C-06, *Project Turnover*, purpose and scope states, "The work scope to be assigned to the Project Turnover (PT) organization will be determined by agreement between the Project Manager and the PT manager."

- What agreement was reached and documented between the Project Manager and PT manager?

No formal agreement exists that defines the work scope for ICC between the Project Manager and PT Manager. However, Financial Charge Authorizations have been established for the PT organization for Fiscal Year (FY) 2006. Budget planning for FY 07 will establish work scope, schedules and deliverables of the PT organization with respect to the AN/AW new exhauster skid ICC.

3. Is the field equipment appropriately marked and tagged for the intended use?

Assessment Results

The functional AW/AN Exhauster Mini-Power Zone panelboards do not meet the requirements of TFC *Control of Tank Farm Electrical Panelboard Schedule Drawings*, TFC-ENG-FAC SUP-C-09 that requires specific electrical panelboard schedules. The procedure states, “This procedure applies to all tank farm personnel who work with electrical panelboard schedule drawings that are required to be placed in the electrical panelboards as circuit directories.”

The functional “A” train Exhauster Mini-Power Zone, AW241-VTP-DP-351, did have a circuit directory affixed to the backside of the flip-up cover that meets the requirements of National Electric Code (NEC) paragraph 408.4, Circuit Directory or Circuit Identification. During the assessment the TFC identified the one-line drawings to be used as panelboard schedules in both exhauster skids mini-power zone panels (four of them). The one-line drawings are not required for panelboard schedules but are typically used for panelboard schedules in the field. Electrical one-line drawings are essential drawings under TFC document, Engineering Drawings, TFC-ENG-DESIGN-C-09. The AN/AW one-line electrical drawings for the skids were not listed as “essential drawings” until June 22, 2006.

Observations

A-06-AMTF-TANKFARM-005-O01 – Existing equipment degradation or potential degradation warrants evaluation prior to system testing.

A-06-AMTF-TANKFARM-005-O02 – When Project W-314 was delayed, the Project Turnover process did not address turnover of the new AN/AW exhauster skids for ICC.

A-06-AMTF-TANKFARM-005-O03–Electrical panelboard schedules were not issued as facility status drawings and physically installed in the AW (AN was not verified) electrical panels in accordance with TFC-ENG-FAC SUP-C-09, *Control of Electrical Panelboard Schedules*

A-06-AMTF-TANKFARM-005-O04– No objective evidence was provided to support the position that the Seal Pots were drained and purged

A-06-AMTF-TANKFARM-005-O05 – The Winterization Program is not effectively implemented for the AN/AW new ventilation skids

A-06-AMTF-TANKFARM-005-O06 – The surveillance program for the AN/AW new ventilation skids is not comprehensively and effectively implemented

4.2 Performance Objective – 241-AN/AW New Exhauster Skid Availability

The W-314 project draft schedule baseline has operational startup of the AN exhauster skid in Fiscal Year (FY) 2009 and AW exhauster skid in FY 2010. Since it will be

several years before operational startup, availability of the system was not addressed by this assessment as originally scoped.

4.3 Performance Objective – 241-AN/AW New Exhauster Skid Ongoing System Maintenance

The 241-AN/AW exhauster skid maintenance activities are covered in the Performance Objective 4.1.

4.4 Performance Objective – DST Primary Ventilation Assessment Overview

The DOE ORP conducted an oversight review of the TFC Phase II VSS assessment of the DST Primary Ventilation Systems.

The oversight assessor determined that the TFC Phase II VSS assessment team adequately evaluated the DST Primary Ventilation Systems. The ORP review resulted in no Findings or Observations. This is because the areas of weakness identified by the ORP assessor were also identified and appropriately addressed in the contractor report and subsequent Program Evaluation Request (PER) entries. The ORP will monitor the corrective actions that the contractor uses to address the issues.

During the performance of this review, the ORP assessor verified that:

- The contractor assessment team was adequately staffed,
- The CRADs were appropriately comprehensive,
- The team performed the assessment activities in accordance with the CRADs, and
- The final report adequately documented the team's observations and recommendations

5.0 CONCLUSIONS

The assessment team concluded that although there are several weaknesses in the overall care and custody of the W-314 AN/AW exhauster skids, if the weaknesses are corrected, that would ensure minimal degradation of the skids and not result in irreversible damage. It should be noted that continued testing (operational test) is required prior to startup which should identify any damaged or degraded components. When W-314 was delayed (June 2005), the TFC PT Process did not cover turnover of the new AN/AW exhauster skids for maintenance care and custody. The current W-314 system status as defined by the TFC is "ICC." Lacking this turnover, the ICC of the AN/AW exhauster skids was not formally defined which led to inconsistent maintenance implementation and potential degradation of equipment. The W-314 project draft schedule baseline has operational startup of the AN exhauster skid in FY 2009 and AW exhauster skid in FY 2010. Since it will be several years before operational startup, availability of the system was not addressed by this assessment as originally scoped. The ORP assessor concluded that the TFC VSS assessment of the DST Primary Ventilation Systems performed during June 2006 was adequate in addressing the availability of the 241-AN, 241-AW, 241-AY

and 241-AZ tank farm primary ventilation systems and ascertaining their ability to operate reliably on a continuing basis for the remaining service life.

6.0 REFERENCES

DOE 2006 - ORP M 220.1, *Integrated Assessment Program*, January 2006, U. S. Department of Energy Office of River Protection, Richland, Washington.

DOE 2001 – Memorandum from S. V. Cary (DOE) to DOE Environmental Management, *Model Assessment Criteria and Guidelines for Performing Phase II Assessments of Safety Systems at Defense Nuclear Facilities*, November 2001, U. S. Department of Energy, Washington, D. C.

Specific references and personnel contacted for each assessment performance objective are listed in Appendix A.

APPENDIX A

CRITERIA REVIEW AND APPROACH

DOCUMENTS

**Criteria and Review Approach Document
241-AN/AW New Exhauster Skid Assessment 2006**

Functional Area: DST Primary Ventilation	Assessment Element: 241-AN/AW New Exhauster Skid Current Status	Facility or Process: Tank Farms	Date: June 19-23, 2006	CRITERIA MET YES: <u> X </u> NO: <u> </u>
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OBJECTIVE: Identify the current status of maintenance, surveillance and availability of the 241-AN/AW new exhauster skids since Project W-314 ramp down.

Performance Criteria or Assessment Elements:

1. Are applicable 241-AN/AW new exhauster skids maintenance and surveillance requirements identified to preclude system degradation and ensure availability?
2. Are the 241-AN/AW new exhauster skids procedures implemented and documented to ensure the surveillance and maintenance requirements?
3. Is the field equipment appropriately marked and tagged for the intended use?

Approach:

- Interview responsible organization (Engineering and Operations) to identify requirements.
- Lines of Inquiry based on identification of requirements.
- Review Tank Farm Contractor (TFC) procedures and identify implementing procedures that ensures operations, maintenance, testing, inspection of skid equipment.

Documentation:

241-AN Exhauster Train A Acceptance Test Report, RPP-17672, Rev 1, July 28, 2004
 241-AN Exhauster Train B Acceptance Test Report, RPP-17673, Rev 1, July 28, 2004
 241-AN New Exhauster Preventative Maintenance Data Sheets (PMs) , seven pages
 241-AW Exhauster Train A Acceptance Test Report, RPP-20211, Rev 0, May 4, 2004
 241-AW Exhauster Train B Acceptance Test Report, RPP-20212, Rev 0, May 4, 2004
 241-AW New Exhauster PMs , seven pages
 241-AW Ventilation Tank Primary System, W-314 Phase 2 Operational Acceptance Test-Cold, (Draft) June 25, 2004
 49CFR970.5245-1(i) Property Management
 Activity Description for Project W-314 Phase II 241-AN abnd 241-AW Tank Farms Primary Ventilation System Upgrades, AD-W341AN-01, Rev 1 June 7, 2006
 Assessment of Double-Shell Tank Internal Vacuum Specification Limits on Primary Tanks, HNF-1838, Rev 0B

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CH2M HILL Hanford Group, Inc. Contract No. DE-AC27-99RL14047, Part II – Section 1, Contract Clauses, DEAR 970.5245-1
CH2M HILL Hanford Group, Letter to ORP, Ramp Down Plan for the Tank Farm Restoration and Safe Operations Project (W-314), CH2M-0501449, date July 27, 2005
Construction Specification W-314 Phase 2 AW Tank Farm Upgrades, W-314-C20, Rev 2, November 11, 2004
ECN 721922 R0, AN Vacuum Relief Valve Addition, August 12, 2004
ECN 721922 R1, AN Vacuum Relief Valve Addition, January 18, 2005
ECN 721923 R0, AW Vacuum Relief Valve Addition, August 11, 2004
ECN 721923 R2, AW Vacuum Relief Valve Addition, January 18, 2005
ECN W-314-5A-075 R0, W-314 AN Phase II Project Turnover/Field Verification Drawing Upgrades, April 8, 2004
E-mail, M. Garrett to B. Parnell, et al, AN/AW Exhauster Lay Up, June 23, 2005
H-14- 104388, Sheet 1, Rev3, Piping AN Farm Tank Exhauster Plan, May 4, 2005
H-14-020102, Sheet 1, Ventilation Tank Primary System (VTP) O&M System P&ID, August 10, 2004
H-14-105529, Sheet 1, Rev 6, AN241-VTP (W-314) Exhauster Train “A” Assembly, July 1, 2004
H-14-105529, Sheet 2, Rev 6, AN241-VTP (W-314) Exhauster Train “A” Assembly, July 1, 2004
H-14-105529, Sheet 3, Rev 6, AN241-VTP (W-314) Exhauster Train “A” Assembly, July 1, 2004
H-14-105543, Sheet 1, Rev 6, AN241-VTP (W-314) Exhauster Train “B” Assembly, July 1, 2004
H-14-105543, Sheet 2, Rev 6, AN241-VTP (W-314) Exhauster Train “B” Assembly, July 1, 2004
H-14-105543, Sheet 3, Rev 6, AN241-VTP (W-314) Exhauster Train “B” Assembly, July 1, 2004
H-14-105579, Sheet 1, Rev 6, AN241-VTP (W-314) Exhauster Train “B” Enclosure Assembly, July 1, 2004
H-14-105579, Sheet 2, Rev 6, AN241-VTP (W-314) Exhauster Train “B” Enclosure Assembly, July 1, 2004
H-14-105676, Sheet 1, Rev0, AW241 Exhauster Train “A” &”B” Drawing Index
H-14-105679, Sheet 1, Rev 4, AW241 Exhauster Train “A” Assembly, August 12, 2004
H-14-105679, Sheet 2, Rev 2, AW241 Exhauster Train “A” Assembly, August 12, 2004
H-2-71900, Sheet 5, Rev 0, AN241-VTP (W-314) Drawing Index, July 1, 2004
Hanford Document Control System Change Notice HDCS-CN-26101, Project W-314 issuing as-built drawings..., June 1, 2005
Material Receipt, Storage, Issuance, Return, and Excess Control, TFC-BSM-FPM_MC-C-01, Rev D-1, May 26, 2006
Operational Acceptance Checklist for Project W-314 Double-Shell Tank Primary Ventilation AW HVAC System, OAC-314AWHVAC-01, Rev 0, October 27, 2003
Operational Readiness Program Plan, Rev B, July 12, 2005
Problem Evaluation Request (PER) 2005-4184, Freezing of Excavated Transfer Lines
Problem Evaluation Request (PER) 2006-0623, Winterization Program

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Project Turnover Program Plan, TFC-PLN-72, Rev A-2, April 26, 2006
Project Turnover, TFC-PRJ_SUT-C-06, Rev C-3, April 26, 2006
Project W-314 AN Tank Farm Primary Ventilation System Level 3 Readiness
Assessment Plan of Action (POA), POA-W-314ANHVAC-01, Rev 0, January 15, 2003
Project W-314 AN Tank Farm Primary Ventilation System Restart Description, SRD-W-
314AN-01, Rev 0, September 25, 2002
Project W-314 Specific Test and Evaluation Plan 241-AN Tank Farm HVAC Upgrades
Phase 2, RPP-13198, Rev 1, July 8, 2004
Project W-314 Specific Test and Evaluation Plan 241-AW Tank Farm Phase 2 HVAC
Upgrades, RPP-15729, Rev 1, September 26, 2005
Project W-314 TFRSO, 241-AN Tank Farm Upgrades, Primary Ventilation System
Instrument List, RPP-17482, Rev 1, July 9, 2004
Property Management Program Plan, TFC-PLN-04, Rev A-1, September 28, 2005
Root Cause Analysis Report (PER 2005-4184), December 14, 2005
Safety Equipment List for AW241 Exhauster Units (A and B skids), PTI-W-314-SEL-
002, January 23, 2004
Specification for a Primary Exhauster System for Waste Tank Ventilation, RPP-7881,
Rev 1, July 8, 2004
Startup and Testing Program Plan, TFC-PLN-77, Rev A-1, April 6, 2006
Sub-Test Plan for 241-AN and 241-AW Farms Ventilation Tank Primary Systems, W-
STP-1.4/1.6, Rev 1, June 23, 2004
System Walkdown Checklist, AN and AW W-314 Installed Exhausters, June 14, 2006
Tank Farm Contractor Construction Completion Document, W-314-AN-Ph2-CCD-2,
May 5, 2004
Tank Farm Contractor Construction Completion Document, W-314-AW-Ph2-CCD,
August 4, 2004
Tank Farm Maintenance Procedure 3-MISC-126, Rev B-0, July 27, 2004
Tank Farm Maintenance Procedure 3-MISC-363, Rev C-1, March 19, 2004
Tank Farm Operating Procedure TO-040-740, Rev H-5, Checklist 1: Cold Weather
Protection Determination Work Sheet February 9, 2006
Tank Farm Operating Procedure TO-040-740, Rev H-5, Perform Routine Surveillance of
Winterized Buildings and Equipment for East Tank Farms, February 9, 2006
Testing Program Plan, TFC-PLN-26, Rev B-2, April 6, 2006
W-314 AN Primary Ventilation System, Equipment Identification Numbers (EINs), 26
pages
W-314 AW Primary Ventilation System, EINs, 20 pages
W-314 Project Equipment Management Turnover, RPP-29144, Rev 0, May 4, 2006
W-314 Project Schedule (DRAFT – BCR RPP-06-003, as of 6/13/2006)
Work Order (WO) 2E-04-02105, Correct Misc. Winterization Deficiencies
Work Order Waste Feed Operations (WFO), WFO-WO-04-000083, East Tank Farm
Winterization (DEC) December 27, 2004
Work Order WFO-WO-05-002905, 241-AN, Job Plan ET-07384
Work Order WFO-WO-05-003202, East Tank Farm Winterization February (FEB), Job
Plan ET-07384

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Work Order WFO-WO-05-003205, East Tank Farm Winterization (FEB), Job Plan ET-07939

Work Order WFO-WO-06-000626, 241-AN De-Winterization, Job Plan ET-07358,
Work Order WFO-WO-06-000653, 241-AW De-Winterization, Job Plan ET-07940, May 4, 2006

Records Reviewed:

CH2M-0501449, Ramp Down Plan for the Tank Farm Restoration and Safe Operations Project (W-314).

Control of Tank Farm Electrical Panelboard Schedule Drawings, TFC-ENG-FAC SUP-C-09, Rev. A-1, dated June 28, 2005.

Engineering Drawings, TFC-ENG-DESIGN-C-09, Rev. C-1, dated August 29, 2005.

2005 National Electrical Code (NEC).

OSHA Standards for General Industry, 29 CFR Part 1910, Subpart S.

AW241-VTP (W-314) Exhauster Train "A" One Line Diagram, H-14-105710, Rev 3

AW241-VTP (W-314) Exhauster Train "B" One Line Diagram, H-14-105722, Rev 3

Interviews Conducted:

WFO/WTP Technical Integration

Director, WFO Facilities

Tank Farm Facility Manager

DST Maintenance Engineering

Director, WFO Engineering

Electrical and I & C Lead Engineer

Engineering Software Lead

Procedures Project Coordinator

Turnover Lead

Project Turnover Manager

WFO Project Interface

Maintenance Engineer

DST Primary Ventilation Systems Engineer

Director, Start Up and Testing

Testing Manager

Testing Engineer

Director, WFO Project/Construction

WFO Project Administrator

Director, Engineering Standards

Field Observations:

Toured the AN/AW Ventilation Skids. Overall housekeeping was good. The vinyl on the flex conduit was degraded by ultraviolet (UV) radiation. Labels were on all of the equipment and cabling on the AW skid. Observed some missing labels on the AN skid.

Discussion of Results:

Contract DE-AC27-99RL14047, Part II, Contract Clauses sites Department of Energy Acquisition Regulation (DEAR) 970.5245.1, Property as a contract requirement. DEAR 970.5245.1, *Property, Item f, Risk of Loss of Government Property*, states, “The contractor shall not be liable for the loss or destruction of, or damage to, government property unless such loss, destruction or damage was caused by any of the following: (c) Failure of contractor managerial personnel to establish, administer, or properly maintain an approved property management system in accordance with (i)(1) of this clause. Section I, Property Management (1) Property Management System, (i) states “the contractor shall establish, administer, and properly maintain an approved property management system of accounting for and control, utilization, maintenance, repair, protection, preservation, and disposition of Government property in its possession under the contract.” This requirement is implemented in Procedure TFC-PLN-04, *Property Management Program Plan*. Section 1 states, “The objective of property management is to perform the functions of acquisition, receiving, maintenance, protection, storage, movement, and disposition of government property in a manner that will result in effective support to CH2M HILL programs with maximum asset use and minimum investment...Managers have primary responsibility for the acquisition, utilization, maintenance, and disposition of material needed to accomplish the mission of their organizations.”

Section 2.3, Managers and Supervisors (Custodians), item 4 states, “Maintain cognizance of government property in their custody with particular emphasis on identification, location, use, operating condition, and current operating status.”

Based on these requirements the performance criteria are addressed below.

1. Are applicable 241-AN/AW new exhauster skids maintenance and surveillance requirements identified to preclude system degradation and ensure availability?

The TFC provided an informal operating status of the AN/AW new exhauster skids. The TFC considers the operating status as Interim Care and Custody (ICC). This is not a “normal” operating status defined by project management system requirements. The reason for this unique terminology is that the W-314 project which procured and installed the AN/AW new exhauster skids was put on “hold” due to funding considerations in 2005. The new AN/AW exhauster skids have not completed the startup and testing process required prior to hot operational startup. The current plans are to operationally implement and “hook up” the new exhausters in Fiscal Year (FY) 2009 for AN and FY 2010 for AW. During this “interim time period,” the TFC has defined ICC as “those reasonable actions:

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- As defined in the Project Turnover Document (PTD);
- Based on technical considerations and length of time that the system or component will be in ICC;
- To protect the system from loss or damage; and
- To prevent system degradation from environmental conditions.”

The TFC evaluated the maintenance actions necessary for ICC (Table A-1, TFC Maintenance Evaluation). The resultant actions are:

- Place cap on stack that can breathe to prevent pressure build up and pest intrusion
 - Seal Pot drain and purge complete for AN/AW
 - Winterization has been performed since units were placed in farms (heater and heat trace on)
 - Air conditioner on in hot weather
 - Rotate shaft monthly
 - Continue to utilize Winterization procedure
 - Leave power to ACs and heaters on and allow to operate appropriately.
2. Are the 241-AN/AW new exhauster skids procedures implemented and documented to ensure the surveillance and maintenance requirements are met?

Given the definition of ICC above, and the maintenance actions necessary for ICC, which is not a formally recognized condition of equipment status, the following questions are applicable.

- Who is the custodian for the new AN/AW ventilation skids during ICC?

The skids are physically located within the boundaries of AN and AW farms. Therefore, the custodian is Waste Feed Operations (WFO). However, WFO is being supported by multiple organizations during this interim period before operational startup. The Project Turnover organization is responsible for the TFC process for Project Turnover defined by TFC-PLN-72, *Project Turnover Program Plan* and TFC-PRJ-SUT-C-06, *Project Turnover*. These plans define the roles and responsibilities to develop project turnover documentation (e.g., PTD, maintenance requirements, Master Equipment Lists (MEL), Safety Equipment Lists (SEL), Vendor Information files, etc.). The PTD is a document that provides a status of the components that make up the new AN/AW ventilation skids. The Startup and Testing, within the Project Delivery organization is responsible for the testing program defined by TFC-PLN-26, *Testing Program*. The Double Shell Tank (DST) Project and Maintenance Engineering is responsible for establishing the maintenance requirements for ICC and normal

operations. WFO Engineering has the “system engineer” responsibilities for the skids (i.e., maintenance).

- What is the operating condition and status of the AN/AW ventilation skids?

The defined maintenance actions for ICC and status are provided below:

- Place cap on stack that can breathe to prevent pressure build up and pest intrusion

Work Packages WFO-WO-06-001302 for AN farm and WFO-WO-05-002006 for AW farm are “Ready for Planning” to cap stacks. The required due dates are 6/21/06 and 8/29/06 respectively.

- Seal Pot drain and purge complete for AN/AW

Interviews with personnel indicate that construction performed the drain and purge and that the valves are closed and locked. The corrective action for PER 2004-0755 involved loss of power to the skids in February 2004. The corrective action was to verify no damage to the seal pots. The TFC evaluated the seal pots for proper integrity and physical deformation.

Specific evaluation results are summarized below.

- “a. Seal pot levels were confirmed to be unchanged.
- b. Inspection of the visible portions of the pots showed no physical deformation.
- c. System operating vacuums were verified to be proper and unchanged.

The seal pots sustained no apparent damage. No further action is required.” This action only verified the condition of the seal pots in February 2004. The two work packages for the acceptance tests are 2E-03-01608 for AW and 2E-03-00989 for AN. The acceptance reports do not document whether the seal pots were drained and purged. Walkdown identified the seal pot valves to be in the closed position. However documented evidence of draining and purging could not be produced for this assessment.

- Winterization has been performed since units were placed in farms (heater and heat trace on)

The winterization program for the AN/AW new exhauster is defined in 3-MISC-126, *Tank Farms Weekly Check of Heater and Heat Trace* as implemented by preventative maintenance

ET-07384 (AN) and ET-07939 (AW). Operating procedure TO-040-740, *Perform Routine Surveillance of Winterized Buildings and Equipment for East Tank Farms* performs duplicative surveillances of the heaters on the AN/AW skids. These are all weekly surveillances. In addition, procedure 3-MISC-363, *Winterization/De-Winterization Tank Farms*, implemented by ET-07940, performs a once a year check that the heaters are off and ACs are on. The process requires that any deficiencies noted in the surveillances be documented and corrected. The assessment team identified several issues based on review of these procedures and data sheets. The issues include:

- PER-2005-4184 originated December 15, 2005 identified similar ineffective implementation and captured the issues very well. However, there continue to be issues associated with the implementation from October 2005 through March 2006.
- There are inconsistent acceptance criteria given in the three procedures (e.g., “ensure operable and on or >32 degrees F,”))
- The time of day for the heater/heat tape surveillances may potentially not determine operability of the heaters/heat tape (if the heat tape is showing > 5 degrees F over ambient and ambient is -20 degrees F then the heat tape is below freezing.)
- There are inconsistent responses for the same weekly check of the same equipment (e.g., one data sheet says “Y” another says “N” and yet another says “n/a” or “O/S”)
- There are over 110 individual pieces of equipment listed in work package 2E-04-02105 that captures several “years” of deficiencies from winterization surveillances. To date this package is “In Planning” and has not been worked.
- Air conditioner on in hot weather
There is only one check in March (per procedure 3-MISC-363) to ensure the air conditioners for the AN/AW new ventilation skids are operable/operating. There are no other surveillances for the rest of the summer months and no acceptance criteria to determine operable/operating.
- Rotate shaft monthly

The assessment team requested documented evidence of rotating the shaft monthly. The TFC did not have a monthly preventative maintenance package to rotate the shaft monthly. As a result of the assessment, an update to ET-05488, General Monthly Exhaust Fan Inspection was issued for the AN/AW exhauster skids on 6/26/06.

- Continue to utilize Winterization procedure

The assessment team reviewed the root cause analysis of PER-2005-4184. Although the root cause dealt with exposed transfer lines during freezing weather, one of the contributing causes was the identification of a weakness in the overall winterization program. From the root cause analysis the TFC identified the following contributing cause:

“Contributing Cause 01: Winterization Plan weaknesses inhibited the effective implementation of the winterization program. The assessment of the winterization program noted several concerns with how WFO implemented the program, but also noted several weaknesses with the design and effectiveness of the plan. Some specifics include:

- Lacking a programmatic philosophy to ensure consistent implementation among various organizations.
- No centralized or locally controlled process that manages and ensures the implementation of the plan.
- No documented management philosophy that establishes guidelines on what actions need to be taken when removing facility heating, including specific temperature ranges and planning margins.
- No guidance on actions to take during inclement conditions such as freezing fog or freezing rain, when known ventilation freezing problems have occurred.
- Lacking a philosophy of implementation that can ensure key-personnel understand the intent and basis for the program.
- Lacking effective implementation mechanisms and tools to ensure consistent implementation and a platform for accepting feedback for future activities.

As winterization program implementation is an annual process, the corrective actions assigned (based on PER 2005-4184) are designed to improve the preparation and assessment for vulnerabilities for the winter of 2006/2007 and following years.

Specific actions include:

- Revise the winterization plan to identify excavated waste transfer lines as a vulnerability and to address noted weaknesses identified in the assessment of the Winterization Plan.
- Establish a Turn-over process that establishes clear roles and responsibilities for Project related activities.
- Issue Project Turnover Documents for projects that have been suspended.
- Develop a Lessons Learned bulletin for operations and project personnel on freeze protection lessons learned, including the vulnerabilities associated with excavated waste transfer lines.
- Issuance of Lessons Learned for demobilization activities.

An End Point Effectiveness Assessment will be performed in late October with the results presented to the TFC Executive Safety Review Board that addresses the following:

- Verification of completion of actions.
- Verification that WFO/CO/Facility Manager are implementing program.
- Verification of implementation and utilization of turn over process.”

The assessment team agrees with the programmatic issues raised in the root cause analysis and associated corrective actions.

- Leave power to AC and heaters on and allow to operate appropriately.

The corrective actions identified above associated with PER 2005-4184 should ensure the power to the skids is on and operate appropriately.

Section 2.3, item 12 states the custodian “Ensure that property assigned to their custody is maintained properly and kept in good operating condition or properly disposed of when no longer required or when rendered unserviceable because of deterioration, obsolescence, contamination, etc.”

- How are the AN/AW ventilation skids being properly maintained and kept in good operating condition?

See assessment team discussion above regarding operating condition of the AN/AW new exhauster skids.

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TFC-PLN-04 references procedure TFC-BSM-FPM_MC-C-01, *Material Receipt, Storage, Issuance, Return and Excess Control*. The purpose and scope of this procedure outlines the process for, "Receipt, handling, storage and issuance of construction material for completed, canceled or suspended projects." Specifically, Section 4.5, item 1 states, "Determine if the project "Will be cancelled or delayed/suspended 90 calendar days or more" go to item 2. Item 2 states, "If the project equipment/material is installed in the tank farm but has not been through formal acceptance, refer to TFC-PRJ-SUT-C-06 for disposition of the material and exit this procedure.

TFC-PRJ-SUT-C-06, *Project Turnover* purpose and scope states, "The work scope to be assigned to the Project Turnover (PT) organization will be determined by agreement between the Project Manager and the PT manager."

- What agreement was reached and documented between the Project Manager and PT manager?

No formal agreement exists that defines the work scope for ICC between the Project Manager and PT Manager. However, Financial Charge Authorizations have been established for the PT organization for FY 2006. Budget planning for FY 07 will establish work scope, schedules and deliverables of the PT organization with respect to the AN/AW new exhauster skid ICC.

The procedure goes on further to describe and establish "the requirements, responsibilities, and administrative controls for the PT group in their support of Project Delivery in the turnover of structures, systems and components (SSCs) to Operations. The development of the PTD and the turnover checklist will be governed by TFC-PLN-72, *Project Turnover Program Plan*, and procedure TFC-PRJ-SUT-C-06. The development of project deliverables including updates to the project equipment list, the Safety Equipment List, Preventive Maintenance Identification forms, Vendor Information Files, and Spare parts list are governed by the existing tank farm contractor procedures."

- Has a PTD been prepared and issued?

RPP-29144, *W-314 Project Equipment Management Turnover*, Revision 0, May 4, 2006. Detailed scope states, "Equipment shown as installed will be turned over to WFO, whereas equipment not installed will be transferred to Material Services for storage until needed." There is no date for "turnover" identified. In addition, during interviews with the PT organization, the listing of equipment to be turned over was based on a component listing provided by the Project organization. An instrument list was subsequently developed and released by the PT organization in 2003. It was revised in July of 2004. To support the PT responsibility to update the MEL, Equipment Change forms were developed of "all SSC" that comprise the AN/AW new exhauster skids. The MEL update for the AN Exhausters was

developed by the PT organization and provided to WFO Project and Maintenance Engineering, in April of 2004 and was finalized and resubmitted in November of 2004. The assessment team identified inconsistencies between the three equipment lists (PTD, instrument list and MEL).

- Have the agreements been identified and documented (e.g., PEL, SEL, maintenance forms, etc.)?

No formal agreement exists that defines the work scope for ICC between the Project Manager and PT Manager. However, Financial Charge Authorizations have been established for the PT organization for FY 2006. Budget planning for FY 07 will establish work scope, schedules and deliverables of the PT organization with respect to the AN/AW new exhauster skid ICC. During interviews with the PT organization, the listing of equipment to be turned over was based on a component listing provided by the Project organization. An instrument list was subsequently developed and released by the PT organization in 2003 for AN skids (RPP-17482, *Project W-314 Tank Farm Restoration & Safe Operations (TFRSO) 241AN Tank Farm Upgrades Primary Ventilation System Instrument List*). It was revised in July of 2004. A similar listing has not been released for AW. To support the PT responsibility to update the MEL, Equipment Change forms were developed of "all SSC" that comprise the AN/AW new exhauster skids. The MEL update for the AN Exhausters was developed by the PT organization and provided to WFO Project and Maintenance Engineering, in April of 2004 and was finalized and resubmitted in November of 2004. The assessment team identified inconsistencies between the three equipment lists (PTD, instrument list and MEL).

- Have the responsibilities and functions described in Section 3.0 and 4.0 of TFC-PLN-72 been completed or provide status?

Typical projects go from design to fabrication to construction to testing to operational turnover and startup. Due to funding issues this project was put on "hold" which is not covered by existing policies, programs, plans or procedures. The TFC identified the ICC just prior to this assessment.

Procedure TFC-PLN-72, states, "The PT program provides CH2M HILL...the process for demonstrating the completion of a project or sub-project and documenting the turnover of SSC to Operations. This plan details the interfaces with other organizations and their roles and responsibilities in the program."

- Are the responsibilities defined in Section 2.1 being performed for the AN/AW ventilation skids?

Review of RPP-29144, PTD identified appropriate organizational

interfaces and approvals.

- Specifically, in accordance with Section 2.1.3, has Operations “Assumed the responsibility of project SSCs for care and custody?”

At the entrance briefing, the TFC identified the primary organization responsible for the care and custody of the AN/AW new exhauster skids. The Vice President WFO has assumed the responsibility for ICC.

TFC letter CH2M-0501449, *Ramp Down Plan for the Tank Farm Restoration and Safe Operations Project (W-314)*, dated July 27, 2005 provides Enclosure 3, a draft Baseline Change Request (BCR) that formally documents the ramp down plan. In the BCR, Enclosure 3, Work Breakdown Structure (WBS) 5.8.4.1.12 and .13, Phase 2 AN and AW Upgrades, it states, “Lay-up and continuous maintenance of the installed HVAC equipment will be performed by Operations at no additional cost to the Program until completion of the work in FY-08.”

- What documentation exists to verify “continuous maintenance” of the systems?

The section discussing the operational status above describes the TFC evaluated ICC requirements for maintenance.

3. Is the field equipment appropriately marked and tagged for the intended use?

The functional AW/AN Exhauster Mini-Power Zone panelboards did not meet the requirements of TFC Control of Tank Farm Electrical Panelboard Schedule Drawings, TFC-ENG-FAC SUP-C-09 that requires specific electrical panelboard schedules.

The functional “A” train Exhauster Mini-Power Zone, AW241-VTP-DP-351, did have a circuit directory affixed to the backside of the flip-up cover that met the requirements of NEC paragraph 408.4, Circuit Directory or Circuit Identification. The panelboard schedule did not meet the requirements of TFC Control of Tank Farm Electrical Panelboard Schedule Drawings, TFC-ENG-FAC SUP-C-09 that requires specific electrical panelboard schedules. The one-line diagrams are normally used for panelboard schedules and are essential drawings under TFC document, Engineering Drawings, TFC-ENG-DESIGN-C-09. The AW Tank Farm one-line electrical drawings were not listed as “essential drawings” until near completion of the assessment.

Conclusion:

The TFC has identified weaknesses to the implementation and maintenance overall care and custody of the AN/AW new exhauster skid

Issue(s):

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The assessment team identified six observations:

- **A-06-AMTF-TANKFARM-005-O01** – Existing equipment degradation or potential degradation warrants evaluation prior to system testing
- **A-06-AMTF-TANKFARM-005-O02** – When Project W-314 was delayed, the Project Turnover process did not address turnover of the new AN/AW exhauster skids for Interim Care and Custody.
- **A-06-AMTF-TANKFARM-005-O03**–Electrical panelboard schedules were not issued as facility status drawings and physically installed in the AW (AN was not verified) electrical panels in accordance with TFC-ENG-FAC SUP-C-09, *Control of Electrical Panelboard Schedules*.
- **A-06-AMTF-TANKFARM-005-O04**– No objective evidence was provided to support the position that the Seal Pots were drained and purged
- **A-06-AMTF-TANKFARM-005-O05** – The Winterization Program is not effectively implemented for the AN/AW new ventilation skids.
- **A-06-AMTF-TANKFARM-005-O06** – The surveillance program for the AN/AW new ventilation skids is not comprehensively and effectively implemented.

Assessor: _____ Gregory L. Jones _____ Russell G. Harwood _____ Glyn D. Trenchard	Approved: _____ Dennis H. Irby, Team Lead
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Table A.1 – TFC Maintenance Evaluation

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AN241-VTP-SP-380	SEAL POT, 20"L x 15"W x 7 1/4"H, 3/16" 304L PLATE			Flush, drain, refill, & isolate	Drain, purge, isolate, & leave drained	Freeze protection
AN241-VTP-SP-480	SEAL POT, 20"L x 15"W x 7 1/4"H, 3/16" 304L PLATE			Flush, drain, refill, & isolate	Drain, purge, isolate, & leave drained	Freeze protection
AW241-VTP-SP-380	POT,SEAL			Flush, drain, refill, & isolate	Drain, purge, isolate, & leave drained	Freeze protection
AW241-VTP-SP-480	POT,SEAL			Flush, drain, refill, & isolate	Drain, purge, isolate, & leave drained	Freeze protection
296-A-44	FLOW, PRIMARY, STACK, A-TRAIN			Cap stacks such as to prevent intrusion	Cap stacks such as to prevent intrusion	N/A
296-A-45	FLOW, PRIMARY ,STACK, B-TRAIN			Cap stacks such as to prevent intrusion	Cap stacks such as to prevent intrusion	N/A

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
296-A-46	FLOW, PRIMARY ,STACK, A-TRAIN			Cap stacks such as to prevent intrusion	Cap stacks such as to prevent intrusion	N/A
296-A-47	FLOW, PRIMARY ,STACK, B-TRAIN			Cap stacks such as to prevent intrusion	Cap stacks such as to prevent intrusion	N/A
AN241-VTP-HTR-110A	CABINET HEATER, 800 WATT	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-110B	CABINET HEATER, 800 WATT	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-110C	CABINET HEATER, 200 WATT	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-390	CABINET HEATER, 115V, 400W, UL LISTED WITH BUILT-IN THERMOSTAT, ADJ 0 - 100 DEGREES F	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AN241-VTP-HTR-550A	HEATER, 120V, 200W, UL LISTED WITH BUILT-IN THERMOSTAT, ADJ 0 - 100 DEGREES F	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-550B	HEATER, 115V, 800W, UL LISTED WITH BUILT-IN THERMOSTAT, ADJ 0 - 100 DEGREES F	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-ENCL-550	Sample and Return Line Heat Trace	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-SP-380	Seal Pot Heat Trace	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-111A	CABINET HEATER, 800 WATT	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-111B	CABINET HEATER, 800 WATT	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AN241-VTP-HTR-111C	CABINET HEATER, 200 WATT	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-490	CABINET HEATER, 115V, 400W, UL LISTED WITH BUILT-IN THERMOSTAT, ADJ 0 - 100 DEGREES F	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-650A	HEATER, 120V, 200W, UL LISTED WITH BUILT-IN THERMOSTAT, ADJ 0 - 100 DEGREES F	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-HTR-650B	HEATER, 115V, 800W, UL LISTED WITH BUILT-IN THERMOSTAT, ADJ 0 - 100 DEGREES F	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-ENCL-650	Sample and Return Line Heat Trace	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-SP-480	Seal Pot Heat Trace	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AN241-VTP-DE-005	De-entrainer Heat Trace	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-DE-006	De-entrainer Heat Trace	ET-07363	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-110A	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-110B	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-110C	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-390	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AW241-VTP-HTR-550A	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-550B	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-ENCL-550	Sample and Return Line Heat Trace	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-SP-380	Seal Pot Heat Trace	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-111A	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-111B	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AW241-VTP-HTR-111C	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-490	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-650A	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-HTR-650B	HEATER	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-ENCL-650	Sample and Return Line Heat Trace	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-SP-480	Seal Pot Heat Trace	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AW241-VTP-DE-005	De-entrainer Heat Trace	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-DE-006	De-entrainer Heat Trace	ET-07936	Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-AC-110	AIR CONDITIONER, 6000 BTU/HR, 120VAC, 125 DEGREE F MAX TEMP		De-Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AN241-VTP-AC-111	AIR CONDITIONER, 6000 BTU/HR, 120VAC, 125 DEGREE F MAX TEMP		De-Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-AC-110	UNIT,CONDITIONING,AIR CONTROLLER,ANALYSIS		De-Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment
AW241-VTP-AC-111	UNIT,CONDITIONING,AIR CONTROLLER,ANALYSIS		De-Winterization	Perform a complete system shutdown	Leave system powered & turned on	Create a controlled storage environment

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AN241-VTP-EF-009	EXHAUST FAN, CLASS 100 SWSI, RATED FOR 2851 ACFM @ 24" SP AND 3545 RPM		Rotate Shaft	Rotate shaft twice monthly/grease bearings monthly	Rotate shaft monthly/no grease bearings	After over two years observation this is adequate
AN241-VTP-EF-010	EXHAUST FAN, CLASS 100 SWSI, RATED FOR 2851 ACFM @ 24" SP AND 3545 RPM		Rotate Shaft	Rotate shaft twice monthly/grease bearings monthly	Rotate shaft monthly/no grease bearings	After over two years observation this is adequate
AW241-VTP-EF-009	FAN,EXHAUST		Rotate Shaft	Rotate shaft twice monthly/grease bearings monthly	Rotate shaft monthly/no grease bearings	After over two years observation this is adequate
AW241-VTP-EF-010	FAN,EXHAUST		Rotate Shaft	Rotate shaft twice monthly/grease bearings monthly	Rotate shaft monthly/no grease bearings	After over two years observation this is adequate
AN241-VTP-YYC-350	PLC PROCESSOR/CHASSIS WITH INTEGRAL POWER SUPPLY		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-YYC-450	PLC PROCESSOR/CHASSIS WITH INTEGRAL POWER SUPPLY		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AW241-VTP-YYC-350	CONTROLLER,PROGRAM		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AW241-VTP-YYC-450	CONTROLLER,PROGRAM		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-CP-110	INDUSTRIAL CONTROL COMPUTER (Nematron)		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-CP-111	INDUSTRIAL CONTROL COMPUTER (Nematron)		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AW241-VTP-CP-110	INDUSTRIAL CONTROL COMPUTER (Nematron)		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AW241-VTP-CP-111	INDUSTRIAL CONTROL COMPUTER (Nematron)		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AN241-VTP-RT-554	CAM, AMS4, DISPLAY UNIT W/PGM ANS4FP V.3.01 OR HIGHER, OUTPUT RELAYS, RS-485 COMMUNICATIONS, AND RED ALARM STROBE AND HANDLE REMOVED		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-RT-654	CAM, AMS4, DISPLAY UNIT W/PGM ANS4FP V.3.01 OR HIGHER, OUTPUT RELAYS, RS-485 COMMUNICATIONS, AND RED ALARM STROBE AND HANDLE REMOVED		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AW241-VTP-RT-554	TRANSMITTER,RADIATION		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AW241-VTP-RT-654	TRANSMITTER,RADIATION		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-FCV-556	MASS FLOW CONTROLLER, LOW PRESSURE DROP SPRING, 0 - 4 SCFM INPUT, 4 - 20 mA OUTPUT, 3/4" SWAGELOK SYSTEM CONNECTIONS		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	TFC MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AW241-VTP-FCV-556	MASS FLOW CONTROLLER, LOW PRESSURE DROP SPRING, 0 - 4 SCFM INPUT, 4 - 20 mA OUTPUT, 3/4" SWAGELOK SYSTEM CONNECTIONS		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AW241-VTP-FCV-656	MASS FLOW CONTROLLER, LOW PRESSURE DROP SPRING, 0 - 4 SCFM INPUT, 4 - 20 mA OUTPUT, 3/4" SWAGELOK SYSTEM CONNECTIONS		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-SIC-009	VARIABLE TORQUE AC DRIVE, 480 VAC POWER FLEX 700 W/ PROGRAMMING LCD HIM, 25 HP		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-SIC-010	VARIABLE TORQUE AC DRIVE, 480 VAC POWER FLEX 700 W/ PROGRAMMING LCD HIM, 25 HP		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AW241-VTP-SIC-009	CONTROLLER, INDICATING ,SPEED, VELOCITY		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place

EIN	DESCRIPTION	PMID	PMID Action	VENDOR RECOMMENDATIONS	CH2 MAINTENANCE ACTIONS	BASIS FOR DEVIATION
AW241-VTP-SIC-010	CONTROLLER,INDICATING ,SPEED,VELOCITY		Controlled Environment	Store in controlled environment	Store in controlled environment, in place	Leave heat and AC on in place
AN241-VTP-TK-370	GLYCOL RESERVOIR, 18" DIAMETER, SCHEDULE 10S			Suggested drain	Leave in system	No negative to leave in, plus is a corrosion inhibitor
AN241-VTP-TK-470	GLYCOL RESERVOIR, 18" DIAMETER, SCHEDULE 10S			Suggested drain	Leave in system	No negative to leave in, plus is a corrosion inhibitor
AW241-VTP-TK-370	GLYCOL RESERVOIR, 18" DIAMETER, SCHEDULE 10S			Suggested drain	Leave in system	No negative to leave in, plus is a corrosion inhibitor
AW241-VTP-TK-470	GLYCOL RESERVOIR, 18" DIAMETER, SCHEDULE 10S			Suggested drain	Leave in system	No negative to leave in, plus is a corrosion inhibitor

241-AN/AW New Exhauster Skid Assessment 2006

Functional Area: DST Primary Ventilation System	Assessment Element: TFC DST Primary Ventilation Assessment Overview	Facility or Process: Tank Farms	Date: June 19-23, 2006	CRITERIA MET YES: <u> X </u> NO: <u> </u>
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Objective: Overview the Tank Farm Contractor (TFC) performance of an assessment of the Double Shell Tank (DST) Primary Ventilation System for effectiveness.

Performance Criteria or Assessment Elements:

1. Is the TFC evaluating appropriate DST Primary Ventilation System requirements?
2. Is the TFC assessing a representative sample of DST Primary Ventilation equipment to determine adequate trending of results?
3. Is the TFC verifying applicable Technical Safety Requirement Limiting Conditions for Operation met and surveillance requirement current?
4. Is the TFC evaluating maintenance backlog effects on the DST Primary Ventilation system to meet applicable requirements?

Approach:

- Perform oversight of the TFC DST Primary Ventilation Assessment.

Documentation:

TFC Hanford Group, Inc. *Assessment Plan for Phase II Vital Safety System Assessment of DST Primary Ventilation Systems*, June 12, 2006

RPP-ASMT-30128, Rev 0, *Phase II Vital Safety System Assessment for the Double-Shell Tank Farm Primary Ventilation Systems FY2006-ENG-S-0301*, July 5, 2006

RPP-25799, *System Health Report for Waste Feed Operations Ventilation Systems First Quarter CY 2006*, Rev 4, April 2006

RPP-25799, *System Health Report for Waste Feed Operations Ventilation Systems Fourth Quarter CY 2005*, Rev 3, February 2006

Interviews Conducted:

Assessment Team Leader,
Assessment Team Member,
DST Primary Ventilation System Engineer,
Director, WFO Engineering
Maintenance Engineer

Field Observation:

A walkdown of the AN Tank Farm exhausters revealed that maintenance work was being performed on the system instrumentation at the time of the walkdown. Several examples of deteriorating insulation were noted. The inlet HEPA filter differential pressure (dP) instrumentation was observed to be functioning as were the floating orifice plates. The Vapor Control Zone postings around the exhauster fans were appropriately placed.



Discussion of Results:

1. Is the TFC evaluating appropriate DST Primary Ventilation System requirements?

The TFC assessment methodology followed the United States Department of Energy (DOE) guidance document *Model Assessment Criteria and Guidelines for Performing Phase II Assessments of Safety Systems at Defense Nuclear Facilities*, (DOE 2001). The Criteria, Review, and Approach Documents (CRADs) utilized for the assessment cover four elements which are: (1) Safety Function Definition, (2) Configuration Management, (3) Systems Maintenance, and (4) Systems Surveillance and Testing.

There were no issues associated with the Safety Function Definition CRAD.
There were no issues associated with the Configuration Management CRAD
There were two issues associated with the Systems Maintenance CRAD.
(Observations O-1 & O-2, Problem Evaluation Request (PER)-2006-1302 and PER-2006-1303 respectively)

There were four issues associated with the Systems Surveillance and Testing CRAD. (Observations O-3, O-4, O-5 & O-6, PER-2006-1304, PER-2006-1305, PER-2006-1306, and PER-2006-1307 respectively).

2. Is the TFC assessing a representative sample of DST Primary Ventilation equipment to determine adequate trending of results?

The TFC assessment reviewed the DST Primary Ventilation Systems serving the 241-AN, AW, AY, and AZ Tank Farms only. This is because a VSS assessment was performed on 241-SY primary ventilation in February, 2003, on 242-S, 242-T, and 702-AZ building ventilation systems in February, 2004, and on 241-AP in May, 2005.

The TFC assessment reviewed and evaluated the previous PERs associated with the

subject systems.

3. Is the TFC verifying applicable Technical Safety Requirement Limiting Conditions for Operation met and surveillance requirement current?

The TFC assessment resulted in one observation related to the Technical Safety Requirements (TSR) associated with equipment calibrations and uncertainty calculations.

4. Is the TFC evaluating maintenance backlog effects on the DST Primary Ventilation system to meet applicable requirements?

The TFC assessment reviewed and evaluated the work orders (WO) associated with the subject systems. Each of the subject systems was evaluated under the CRAD for System Maintenance.

Conclusion:

The ORP oversight assessor determined that the TFC Phase II Vital Safety System (VSS) assessment team adequately evaluated the DST Primary Ventilation Systems. The ORP oversight resulted in no Findings or Observations. This is because the areas of weakness identified by the ORP assessor were also identified and appropriately addressed in the contractor report and subsequent PER entries. The ORP assessor will monitor the corrective actions that the contractor uses to address the issues.

During the performance of this review, the ORP team verified that:

- The contractor assessment team was adequately staffed,
- The CRADs were appropriately comprehensive.
- The team performed the assessment activities in accordance with the CRADs, and
- The final report adequately documented the TFC assessment team's observations and recommendations

Issue(s): None.

Assessor: _____ Dennis H. Irby	Approved: _____ Dennis H. Irby, Team Lead
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APPENDIX B

TEAM MEMBER

BIOGRAPHIES

Team Member Qualification Summary

Team Member Name: Dennis H. Irby, Assessment Team Leader

Title and Organization: Authorization Basis Engineer
Tank Farm Engineering Division
Office of Assistant Manager Tank Farms Project
Office of River Protection

Areas Assigned: TFC Hoisting and Rigging Safety Management Program Implementation

Summary of Education and Technical Qualifications and Experience:

- Bachelor of Science in Mining Engineering, South Dakota School of Mines & Technology; and
- Master of Science in Mining Engineering, South Dakota School of Mines & Technology.

Summary of Experience:

- Over 30 years of experience in the areas of: nuclear safety authorization basis management, nuclear waste safety issue resolution, technology development, radioactive solid waste management, management of design of nuclear waste repository facilities, construction of high security facilities (including structures, utilities, and safety support systems), project management, manufacturing and marketing of remotely actuated machinery, and conducting field and laboratory research programs related to worker health and safety in mines with flammable gas and respirable dust issues.
- experience and training in:
 - conducting audits, assessments and surveillances related to the DOE Nuclear Safety and Waste Management Orders and the DOE Safety Management System Policy; and
 - application of Management Oversight Risk Tree analysis techniques and DOE Accident Investigation techniques.
- Provided oversight of the resolution of the four priority one safety issues related to tank waste.
- Provided oversight of over 120 Authorization Basis actions, over 40 of which have been completed since the approval of the DSA.
- Has completed qualifications for Waste Management, Mechanical Systems, and Safety System Oversight Qualifications for Double-Shell Tank Primary Ventilation Systems and Double Contained Receiver Tank Purge Air Systems.

Team Member Qualification Summary

Team Member Name: Gregory L. Jones

Title and Organization: Senior Engineer
YAHSGS, LLC.

Areas Assigned: Tank Farm 241-AN/AW Exhauster Skid Status and Maintenance

Summary of Education and Technical Qualifications and Experience:

- Bachelor of Science in Nuclear Engineering Technology, Oregon State University, 1976;
- Qualified Unreviewed Safety Question Evaluator; and
- Professional Member, American Society of Safety Engineers

Summary of Experience:

- Over 29 years experience in the commercial and government environment, safety and health industry;
- Over 25 years experience at Hanford, over 20 in tank farms;
- Safety Basis Compliance Activities in accordance with 10 CFR 830, Nuclear Safety Rule;
- Safety Analysis, Hazard Analysis (HAZOP, PHA, WHAT IF), TSR, Final Safety Analysis Report;
- Provided the lead in implementing over 25 safety basis amendments at the Hanford Tank Farms;
- Developed and assisted in preparing a strategy for implementing the Tank Farms DSA in accordance with 10 CFR 830;
- Development of Safety Management Program assessment guidance, and performing assessments to ensure compliance with DSA in accordance with 10 CFR 830 requirements and 29 CFR 1910 and 1926, OSHA for worker safety protection features;
- Developed implementation plan for DRAFT rule 10 CFR 851, Worker Safety and Health Program;

- Performed root cause analysis, common cause analysis, provided support on TSR violations and recommendations to management to minimize TSR violation potential; and
- Technical Safety and QA Appraisals at the PANTEX Plant and the Analytical Laboratory and Savannah River Technology Center at the Savannah River Site for DOE Headquarters.

Team Member Qualification Summary

Team Member Name: Russell G. Harwood

Title and Organization: Electrical Engineer
Tank Farm Engineering Division
Office of Assistant Manager Tank Farms Project
Office of River Protection

Areas Assigned: Exhauster electrical components and interface.

Summary of Education and Technical Qualifications and Experience:

- Sixteen years experience in the nuclear and environmental restoration fields
- Safety System Oversight (SSO) Qualified, September 2005
- BS in Electrical Engineering, University of Idaho

Summary of Experience:

- Lead or a member of numerous electrical SSO assessments.
- Program manager of the tank farm system upgrades.
- Program Manager of the DNFSB 2000-2 Recommendation closure (operability of vital safety systems).
- National Electrical Code (NEC) and OSHA inspector for ORP.
- Project manager for the contractor implementation of Basis for Interim Operation (BIO) compensatory measures, instrumentation upgrades, configuration management, emergency preparedness.
- Puget Sound Naval Shipyard electrical design engineer for communication and alarm systems.
- Formal Specialized Training:
Instrumentation and Process Control
Variable Frequency Drives
Programmable Logic Controllers

Team Member Qualification Summary

Team Member Name: Glyn D. Trenchard

Title and Organization: Facility Representative
Tank Farm Operations Division
Office of Assistant Manager Tank Farms Project
Office of River Protection

Areas Assigned: Waste Feed Operations, 242-A Evaporator

Summary of Education and Technical Qualifications and Experience:

- Bachelor of Science in Mechanical Engineering, Washington State University, 1987; and
- Master of Science in Engineering Management, Washington State University, 1999.

Summary of Experience:

- Over 18 years experience in the nuclear field. Currently a Facility Representative assigned Waste Feed Operations and the 242-A Evaporator. Performs routine oversight of contractor operations in these areas.
- Project engineer for the Spent Nuclear Fuels Project, responsible for two large projects (Cold Vacuum Drying and Hot Conditioning System).
- Nuclear Engineer at Puget Sound Naval Shipyard involved in every stage of reactor plant testing including developing written test procedures, conducting pre-test briefs, recording test data, directing test evolutions and auditing nuclear records.
- Experience and training in:
 - Conducting audits, assessments and surveillances related to the DOE Nuclear Safety and Waste Management Orders and the DOE Safety Management System Policy; and
 - Application of Management Oversight Risk Tree analysis techniques and DOE Accident Investigation techniques.

APPENDIX C

**ASSESSMENT PICTURES OF
W-314 AN/AW EXHAUSTER SKIDS**



AW Exhauster from the South



AW Demister Drains Closed



Dust in Variable Frequency Drive Enclosure AW



AW Heat Trace Enclosure 104



Inside PLC Enclosure 110



AW Isolation Point



AW Mini Power Zone



AW Rusted Bolts on Glycol Heater



AN Glycol Heater Rusted Bolts



AN Exhauster Control Enclosure



AN Heat Trace Cabinet 104



AN Exhausters from the South



AN Demister Valves, One Open and One Closed



AN Isolation Point



AN Demister Valve and Lock



AN Sun Shade Over Skid Panels



AW Seal Pot Drain Valve Locks



AW Skid Weight Label



AW Torn Insulation



AN "A" Train Mini Power Zone



AN "A" Train Seal Pot Drain Valve Locks



AN "A" Train Missing Labels



AN "B" Train Missing Labels



AN Glycol Pump and Valve Open