Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

JAN 29 1999

99-PDD-005

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W., Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

TRANSMITTAL OF THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD (DNFSB) RECOMMENDATION 93-5 IMPLEMENTATION PLAN (IP) QUARTERLY REPORT FOR OCTOBER THROUGH DECEMBER 1998

The DNFSB Quarterly Report for October through December 1998 is attached. This quarterly Report addresses issues and milestones as presented in Recommendation 93-5 IP, Revision 1.

The U. S. Department of Energy (DOE), Richland Operation Office (RL) staff have completed several significant technical achievements this quarter. The final technical basis report HNF-SD-WM-CN-058, dated August 1998, "Organic Complexant Topical Report," was submitted on November 25, 1998, to complete 93-5 milestone 5.4.3.3b, "Letter reporting results of testing completion (using real waste samples) to confirm safe storage criteria, and organic solubility and aging effects on fuel content. If models are confirmed, an assessment of tank wastes compared to safety storage criteria will be scheduled." Based on this report, RL closed the condensed-phase organic nitrate Unreviewed Safety Question (USQ) on October 28, 1998, and subsequently, approved the closure of the Organic Complexant Safety Issue and removed 18 organic complexant tanks from the Watchlist (Public Law 101-510, Section 3137) on September 9, 1998. The following two additional DNFSB Milestones were completed during this quarter:

1. 5.4.3.6c, "Letter Reporting Initiation of Tank C-106 Waste Retrieval," November 25, 1998; and
2. 5.6.3.1i, "Update Tank Content Models or Define Limitations of the Models," December 28, 1998.

Tank C-106 sluicing operation initiated on November 18, 1998, was suspended after the air samples taken from the ventilation system exceeded the permit limit of 50-parts-per-million volatile organic compounds level. Problems have been identified. It is estimated that the restart of sluicing will be delayed until March 1999. This delay will slip the expected completion of milestone 5.4.3.6d, "Letter reporting completion of topical report to resolve the High Heat Safety Issue," later than December 1999.

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The shipment of waste samples, using the PAS-1 cask, to BNFL Incorporated continued as scheduled.

On January 6, 1999, Tank Waste Remediation System (TWRS) was incorporated into the Office of River Protection (ORP).

If you have any questions, please contact me or your staff may contact Jackson Kinzer, Acting Manager for ORP, on (509) 376-7591.

Sincerely,

James C. Hall
Acting Manager

PDD:WSL

Attachment

cc w/attach:
J.M. Owendoff, EM-1
C.A. Peabody, EM-4
R.E. Lightner, EM-38
K.T. Lang, EM-38
A. F. Wellner, FDH
M.A. Payne, LMHC (w/o attach)
W.E. Ross, LMHC (w/o attach)
M.B. Whitaker, S-3.1

DNFSB 93-5 QUARTERLY REPORT, OCTOBER 1 TO DECEMBER 31, 1998

EXECUTIVE SUMMARY

The highlights for this quarter were submittal of the Organic Complexant Topical Report and closure of the Organic Complexant Safety Issue, completing the certification inspections of the PAS-1 shipping cask, and continuing waste sample shipments to BNFL, Incorporated using the PAS-1 cask. The current issues discussed are the status of the Tank C-106 sluicing and the remaining milestone related to the High Heat Safety Issue, the status of the Final Safety Analysis Report (FSAR), Tank C-106 thermocouple excursion, and Tank SY-101 level growth. Three Implementation Plan (IP) Milestones were reported complete this quarter.

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1. PURPOSE

This quarterly report covers High-Level Waste Tank Characterization activities at the Hanford Site related to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 during the period October 1 to December 31, 1998. The Recommendation dealt with insufficient technical information to ensure safe storage, operation, retrieval, and disposal of the Hanford high-level tank wastes in both single-shell tanks (SST) and double-shell tanks (DST). An IP responding to Recommendation 93-5 was transmitted to the DNFSB by the Secretary of Energy in January 1994. The plan was accepted by the DNFSB on March 25, 1994. On June 17, 1996, Revision 1, to the IP was submitted to the DNFSB. Revision 1, was accepted by the DNFSB on September 4, 1996, with comments.

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2. QUARTERLY HIGHLIGHTS

2.1. Milestone(s) Submitted

2.1.1. 5.4.3.6c, "Letter reporting initiation of tank C-106 waste retrieval," November 25, 1998.

2.1.2. 5.4.3.3b, "Letter reporting results of testing completion (using real waste samples) to confirm safe storage criteria, and organic solubility and aging effects on fuel content. If models are confirmed, an assessment of tank wastes compared to safe storage criteria will be scheduled," November 25, 1998.

2.1.3. 5.6.3.1i, "Update Tank Content Models or define limitations of the models," December 28, 1998.

2.2. Organic Complexant Topical Report

The final technical basis report HNF-3588, "Organic Complexant Topical Report," was transmitted to the DNFSB on November 25, 1998, to complete 93-5 milestone 5.4.3.3b, "Letter reporting results of testing completion (using real waste samples) to confirm safe storage criteria, and organic solubility and aging effects on fuel content. If models are confirmed, an assessment of tank wastes compared to safe storage criteria will be scheduled." This assessment is included in the topical report. Based on this report, the U.S. Department of Energy (DOE) closed the condensed-phase organic nitrate Unreviewed Safety Question (USQ) on October 28, 1998. Following receipt of concurrence from Senator Ron Wyden's office and the Oregon Department of Energy, DOE approved the removal of 18 organic complexant tanks from the Watchlist (Public Law 101-510, Section 3137) and resolution of the Organic Complexant Safety Issue on December 9, 1998.

2.3. Waste Sample Shipments to Privatization Contractor

The shipment of waste samples to the privatization contractor (BNFL, Incorporated) continued this quarter on schedule. Three shipments of four liters each from Tank AN-102 were completed this quarter using the PAS-1 casks. A fourth shipment is scheduled for January 1999.

2.4. Tanks Sampled

During this quarter one tank was core sampled, five tanks were grab sampled, two tanks were vapor sampled, and monthly vapor grab samples at the Standard Hydrogen Monitoring System (SHMS) cabinets were taken.

2.5 93-5 Closure Planning

A number of activities in the last quarter were aimed at preparing documentation to support a closure request for Recommendation 93-5. The principal activity is preparation of a report requesting closure of the Recommendation Implementation Plan milestone 5.6.3.1.j, "Letter reporting completion of core sampling of all tanks." This document will recommend closure of the milestone based on the data obtained to date from 133 tanks that have been core sampled, combined with additional work that has been completed on understanding tank waste and process history. This information will be coupled with the improvements and institutionalization of key processes and equipment that allow future characterization requests to be met. RL and contractor representatives briefed DNFSB staff on December 9, 1998, on the path forward to closure of the Recommendation. A series of technical discussions on this topic are planned to continue through the next six months.

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3. CURRENT ISSUES

3.1. High Heat Safety Issue Milestones

Waste sluicing operations from Tank C-106 to Tank AY-102 were initiated on November 18, 1998. During the initial sluicing operation, air samples taken from the ventilation system exceeded the 50-parts-per-million volatile organic compounds level specified in the State of Washington Department of Ecology permit for "Non-Radioactive Air Emissions for C-106 Sluicing." Sluicing operations were immediately suspended. Eleven site employees who reported smelling strong odors during the initial sluicing run were given medical evaluations. All findings resulting from these evaluations were negative. When subsequent analysis of the stack air samples failed to identify all the vapors and gases potentially present, a process test was planned. The process test, involving limited sluice pump operations, was run on December 16, 1998, to collect vapor samples essential in planning future sluicing operations, and to gather information useful in designing a potential vapor abatement upgrade for the ventilation system. However, during the test, a leak detector alarm was received from the sluicing pit. Investigation located a jumper leak in the pit that will require repair before sluicing is restarted. Work packages are being prepared to repair the leak. After the leak repair is completed, another process test will be conducted to determine the vapor abatement system required before sluicing can resume. Correcting both of these problems is expected to delay the restart of sluicing until March 1999, at the earliest. This delay will slip the expected completion of milestone 5.4.3.6d, "Letter reporting completion of topical report to resolve the High Heat Safety Issue," later than December 1999. A new expected completion date will be provided when sluicing has been restarted.

3.2. Tank C-106 Thermocouple Temperature Increase

The readings from the thermocouple tree at Tank C-106 riser 14 have been increasing since the initial sluicing operation in November 1998. The most likely explanation is that sluicing has moved waste to be in better contact with the tree, therefore, causing the thermocouples to read the sludge temperature instead of the temperature of a liquid well surrounding the thermocouple tree. The temperatures were stabilizing at the end of December 1998. Riser 8 temperatures show no indication of waste heat up. These readings are currently under evaluation.

3.3. FSAR Milestone

Milestone 5.4.3.1d, Approved FSAR, was due in June 1997. Tier III review of the Tier II-generated Safety Evaluation Report (SER) is projected to be completed by January 30, 1999. DOE Headquarters needs to approve the Facility Hazard Categorization before proceeding with final approval. RL plans to resolve the hazard categorization so final approval of the FSAR can be obtained by April 15, 1999. RL still intends to implement Phase I of the FSAR by September 1999.

3.4. Tank SY-101 Level Growth

Several probe and sample activities were executed to understand a growth in the measured waste level in Tank SY-101. Three probes were made for the tank during the summer by a special Void Fraction Instrument, a tool to measure gas quantities within the waste. Retained gas samples to determine gas composition also were obtained and sent for laboratory analysis. Core sampling this tank is currently in progress. A dedicated multi-contractor and DOE team was formed to address the waste level rise, and will submit a mitigation plan during the next quarter. On December 15, 1998, DOE and contractors provided a detailed briefing on this topic to the DNFSB in Washington DC.

4. STATUS OF REVISION 1 MILESTONES OVERDUE, DUE WITHIN SIX MONTHS, OR COMPLETED DURING THE REPORTING QUARTER

4.1. Safe Storage of Tank Wastes and Safe Operation of Tank Farms

Commitment
5.4.3.1 TWRS Manage Tank Waste Function Authorization Basis
Statement: Upgrade the Authorization Basis for the TWRS Manage Tank Waste Function
Responsible Manager: Assistant Manager, TWRS
Applicable facilities and programs: TWRS
Milestone deliverables/due dates:

d. Approved FSAR.
Due Date: June 1997
Status: Overdue. The estimated completion date (ECD) is January 1999.

5.4.3.3 Organic Complexants
Statement: Complete testing and evaluation confirming simulant results with real waste.
Responsible Manager: Assistant Manager, TWRS
Applicable facilities and programs: TWRS
Milestone deliverables/due dates:

b. Letter reporting results of testing completion (using real waste samples) to confirm safe storage criteria, and organic solubility and aging effects on fuel content. If models are confirmed, an assessment of tank wastes compared to safe storage criteria will be scheduled.
Due Date: November 1998
Status: Completed. Letter reporting completion of this milestone was submitted to DNFSB on November 25, 1998.

5.4.3.6 High Heat
Statement: Retrieve wastes from Tank C-106
Responsible Manager: Assistant Manager, TWRS
Applicable facilities and programs: TWRS
Milestone deliverables/due dates:

c. Letter reporting initiation of Tank C-106 waste retrieval.
Due Date: October 1997
Status: Completed. Letter reporting completion of this milestone was submitted to DNFSB on November 25, 1998.

d. Letter reporting completion of topical report to resolve the High Heat Safety Issue.
Due Date: May 1998
Status: Overdue. Reported ECD is December 1999. A new ECD will be provided when sluicing of Tank C-106 is restarted.

4.2. Technical Basis for Characterization

5.6.3.1 Complete Tank Waste Characterization Basis Sampling and Analysis Statement: Complete the sampling and analysis specified by the Tank Waste Characterization Basis (approximately 28 tanks) to provide the highest priority information requested by the programmatic Data Quality Objectives.
Responsible Manager: Assistant Manager, TWRS
Applicable facilities and programs: TWRS
Milestone deliverables/due dates:

i. Update Tank Content Models or define limitations of the models.
Due Date: December 1998
Status: Completed. Letter reporting completion of this milestone was submitted to DNFSB on December 28, 1998.

5. REFERENCES

None.

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6. APPENDICES

6.1. Tanks Sampled during First Quarter FY 1999 (October through December 1998)

Sample	Actual Start	Actual Finish
AZ-102 Rotary Sample 1 Segments 17	09/23/98	10/9/98
U-105 Grab Sample – Compatibility	10/7/98	10/7/98
Vapor SHMS Grab Samples - Oct 98	10/9/98	10/27/98
W-320 SHMS Grab (C-106/AY-102)	10/14/98	10/19/98
S-102 Grab Sample Compatibility	10/27/98	10/27/98
Vapor SHMS Grab Samples - Nov 98	11/12/98	11/20/98
S-106 Grab Sample Compatibility	11/19/98	11/23/98
AY-102 Grab Sample C-106 Retrieval	11/22/98	11/22/98
Vapor SHMS Grab Samples – Dec 98	12/7/98	12/17/98
AY-102 Vapor Sample Vapor Resolution	12/16/98	12/16/98
C-106 Vapor Sample Vapor Resolution	12/16/98	12/16/98
AY-102 Grab Sample C-106 Retrieval	12/20/98	12/20/98
U-244 Grab Sample (Operations)	12/31/98	12/31/98

6.2. Sampling Schedule for Second Quarter FY 1999 (January through March 1999)

Sample	Early Start	Early Finish
SY-101 Push Sample 3 Segment 22	10/12/98	1/14/99
S-106 Tracer Gas Injections	11/2/98	8/24/99
AX-104 Cone Penetrometer Outside Tank	1/4/99	9/29/99
U-244 Grab Sample	1/4/99	1/5/99
Vapor SHMS Samples - Jan 99	1/4/99	1/22/99
Z-361 Vapor Sample	1/12/99	1/18/99
U-102 Vapor Sample	1/20/99	1/21/99
TX-113 Rotary Sample 1 Segments 11	1/29/99	2/16/99
Vapor SHMS Samples – Feb 99	2/1/99	2/22/99
AW-102 Grab Sample 1.2 (99-1 Campaign)	2/16/99	2/18/99
TX-118 Rotary Sample 2 Segments 8 High Priority	2/17/99	3/22/99
U-103 Grab Sample Compatibility	2/22/99	2/24/99
Vapor SHMS Samples – Mar 99	3/1/99	3/19/99
TX-116 Rotary Samples 2 Segments 12	3/2/99	4/2/99
U-102 Grab Sample Compatibility	3/8/99	3/10/99
TBD Grab Sample Operation Compatibility	3/12/99	3/16/99
AY-102 Grab Sample C-106 Retrieval	3/21/99	3/21/99
TX-110 Rotary Samples 2 Segments 10	3/23/99	4/23/99

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6.3. Tank Sampling and Analysis Plans Issued During the Quarter

Tank	Number	Rev	Date
AY-102 (Grab)	HNF-2958	0-A	11/03/98
SY-101 (Push Mode)	HNF-3375	0	10/09/98
C-106 (Vapor)	HNF-3732	0 0A	12/15/98 12/15/98
AY-102 (Grab)	HNF-2958	0B	12/21/98

6.4. Tank Characterization Reports Issued During the Quarter

Tank	Number	Rev	Date
AX-102	HNF-FD-WM-ER-472	1	12/21/98

6.5. Laboratory Analysis Reports Issued During the Quarter

Tank	Title	Number	Date
BX-110 Auger	45-Day Safety Screening Results and Final Report for Tank 241-BX-110, Auger Samples 95-AUG-045 and 95-AUG-046	WHC-SD-WM-DP-155, Rev. 0B	10/21/98
SX-105	Tank 241-SX-105, Core 229 and 233 Analytical Results for the Final Report	HNF-1639, Rev. 0	11/17/98
AN-101	Tank 241-AN-101, Grab Samples, 1AN-98-1, 1AN-98-2 and 1AN-98-3 Analytical Results for the Final Report	HNF-1640, Rev. 0	10/21/98
ER-311	Tank 241-ER-311, Grab Samples, ER311-98-1, ER311-98-2, ER311-98-3 Analytical Results for the Final Report	HNF-1645, Rev. 0	10/06/98
S-111	Tank 241-S-111, Core 237 Analytical Results for the Final Report	HNF-1647, Rev. 0	10/26/98
S-110	Tank 241-S-110, Core 140, 240, 241 Analytical Results for the Final Report	HNF-1648, Rev. 0	12/02/98
S-102	Tank 241-S-102, Core 232, Analytical Results for the Final Report	HNF-1649, Rev. 0	11/05/98
U-109	Tank 241-U-109, Core 238 Analytical Results for the Final Report	HNF-1650, Rev. 0	11/23/98
TX-118	Tank 241-TX-118, Core 236 Analytical Results for the Final Report	HNF-1651, Rev. 0	11/17/98

S-106	Tank 241-S-106 Core 183 and 184 Analytical Results for the Final Report	HNF-1654, Rev. 0	12/08/98
SY-102	Tank 241-SY-102, Grab Samples 2SY-98-5, 2SY-98-6, 2SY-98-7, 2SY-98-8 Analytical Results for the Final Report	HNF-1658, Rev. 0	12/17/98
S-103	Tank 241-S-103 Grab Samples 3S-98-1, 3S-98-2, 3S-98-3 Analytical Results for the Final Report	HNF-1659, Rev. 0	12/18/98
AN-102 LAW	Tank 241-AN-102 Low-Level Activity Waste Envelope C Analytical Results for the PAS-I Shipping	HNF-1660, Rev. 0	12/30/98
AX-104	Tank 241-AX-104, Residual Solids Leach Test	TWR-3538, Rev. 0	12-07-98

6.6. Table of DNFSB 93-5 Implementation Plan Revision 1 Commitments Status

Number	Description	Due Date	Submitted to DNFSB
5.4.3.1a	Comprehensive Source Terms Report	6/30/96	6/30/96
5.4.3.1b	Report on Lightning Evaluation	8/31/96	8/30/96
5.4.3.1c	Approved Basis for Interim Operation	12/31/96	12/30/96
5.4.3.1d	Approved FSAR	6/30/97	
5.4.3.2a	Topical Report on Resolution of Ferrocyanide Safety Issue	1/31/97	9/23/96
5.4.3.3a	Supporting Technical Document on Organic Complexant Safety Issue	12/31/96	6/27/97
5.4.3.3b	Confirm Safe Storage Criteria, and Organic Solubility and Aging Effects on Fuel Content	11/30/98	11/25/98
5.4.3.4a	Safety Assessment Covering Pool and Entrained Organic Solvent Fires	10/31/96	10/21/96
5.4.3.4b	Organic Speciation of Core Samples for BY-108 and BY-110, and Auger Samples for C-102	10/31/96	10/31/96
5.4.3.4c	Supporting Technical Document for Organic Solvent Safety Issue	12/31/96	12/23/96
5.4.3.4d	Vapor Sampling of all SSTs	12/31/99	
5.4.3.4e	Adequate Vent Path in All SSTs Suspected of Containing Organic Solvents	4/30/00	
5.4.3.4f	Letter Reporting Completion of Vapor Sampling of All DSTs	12/31/00	
5.4.3.5a	Analyses to Determine If Additional Tanks Have Potential to Exceed 25% of the Lower Flammability Limit (LFL)	6/30/96	6/28/96
5.4.3.5b	Gas Monitoring Instrumentation Upgrade Needs for Additional Tanks with the Potential to Exceed 25% of the LFL	8/31/96	8/19/96
5.4.3.5c	Safety Assessment for Rotary Mode Core Sampling in Flammable Gas Tanks	9/30/96	9/27/96
5.4.3.5d	Qualification of Rotary Mode Core Sampling System for Use in Flammable Gas Tanks	9/30/96	1/7/98
5.4.3.5e	Safety Assessment for Saltwell Pumping in Flammable Gas Tanks	10/31/96	10/31/96

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Number	Description	Due Date	Submitted to DNFSB
5.4.3.5f	Letter Reporting Completion of AN Tank Farm Ventilation Upgrade	11/30/96	1/30/97
5.4.3.5g	Flammable Gas Safety Screening of Remaining Passively Ventilated SSTs	11/30/96	11/12/96
5.4.3.5h	Supporting Technical Document on Flammable Gas Safety Issue	12/31/96	1/30/97
5.4.3.5I	External Equipment Spark Sources in Flammable Gas Tanks	12/31/96	12/24/96
5.4.3.5j	Voidmeter and Viscometer Readings in Tanks AN-103, AN-104, and AN-105	12/31/96	12/18/96
5.4.3.5k	Retained Gas Sampling in Tanks AW-101, AN-103, AN-104, AN-105, and A-101	3/31/97	3/28/97
5.4.3.5l	Refinement of Flammable Gas Generation/Retention Models	5/31/97	5/27/97
5.4.3.6a	C-106 Supernatant Sampling and Analysis	10/31/96	10/30/96
5.4.3.6b	C-106 Retrieval Safety Assessment	7/31/97	10/3/97
5.4.3.6c	Initiation of Tank C-106 Waste Retrieval	10/31/97	11/25/98
5.4.3.6d	Topical Report to Resolve the High Heat Safety Issue	5/31/98	
5.4.3.7a	Topical Report to Resolve the Criticality Safety Issue	12/31/96	12/18/96
5.5.6.1a	Completion of High Priority Tanks Sampling and Analysis for the Disposal Program	3/31/98	3/27/98
5.6.3.1a	Comparison Between Truck and Cart Vapor Sampling Systems	9/30/96	9/27/96
5.6.3.1b	Implementation of FTIR Moisture Analysis Capability in 222-S Laboratory	11/30/96	11/19/96
5.6.3.1c	Proposed Content and Format of Tank-by-Tank Safety Status Evaluation	1/31/97	1/30/97
5.6.3.1d	Updated HTCEs	6/30/97	6/6/97
5.6.3.1e	Verification of Headspace Homogeneity	10/31/97	10/22/97
5.6.3.1f	Standard Inventory Estimates for All Tanks	11/30/97	10/31/97
5.6.3.1g	Completion of High Priority Tanks Sampling and Analysis	3/31/98	3/27/98
5.6.3.1h	Tank-by-Tank Safety Status Evaluation	7/31/98	7/22/98
5.6.3.1i	Update Tank Content Models	12/31/98	12/28/98
5.6.3.1j	Completion of Core Sampling of All Tanks	12/31/02	