Meeting Minutes Transmittal/Approval
Office of River Protection
Tri-Party Agreement Project Managers' Meeting
Federal Building, Room 248
Richland, Washington

March 18, 1999

Approval: _____ Date: 5/10/99
Suzanne Dahl, TWRS Disposal Program Manager
Washington State Department of Ecology

Approval: _____ Date: 5/10/99
Hector Rodriguez, ORP TPA Milestone Manager
U.S. Department of Energy, Richland Operations Office

Approval: Cyndi Nunn Date: 5/10/99
Cyndi Nunn, Coordinator
Jacobs Engineering Group Inc.

Meeting Minutes are attached. Minutes are comprised of the following:

- Attendance and Meeting Minutes Summary/Action Items
- Presentation Package/Agenda
- Handout: Ecology Disposal Project Phone List
- Handout: Draft Change Control Forms for M-32-06 and M-32-08
- Handout: 244-AR Vault presentation
- Handout: May 7, 1992 meeting minutes
- Handout: January 23, 1997 meeting minutes
- Handout: March 5, 1997 meeting minutes
- Handout: March 10, 1997 meeting minutes
- Handout: April 29, 1997 meeting minutes
- Handout: M-41-00 status
- Handout: Tank C-106 sluicing status

*** SIGN IN SHEET ***

ORP TRI-PARTY AGREEMENT
PROJECT MANAGERS' MEETING

March 18, 1999
Federal Building, Room 248

NAME	ORG	MSIN	PHONE	MINUTES? Yes/No
Hector M. Rodriguez	DOE	A5-15	376-6421	Yes
Richard Heggen	Ecology		736-5716	yes.
Luanda Bowman	FDH+ TWRS	A3-03	375-3262	yes
Mary Ann McLaughlin	FDH/TPAI	H8-67	376-4084	Y
Patty Morehouse	DOE	57-51	376-1666	Yes
Cyndi Nunn	Jacobs	A2-22	376-4751	—
Suzanne Dahl	Ecology		736-5705	yes
Kevin Kramer	FDH/TPAI	H8-67	376-4026	Yes
A.E. SHERWOOD	WMH/HAZSRV	H6-26	3766391	YES
DAVE DOUGHERTY	ECOLOGY	B5-18	736-3047	YES
Mark Ramsey	DOE	57-54	376-7924	YES
DENNIS IRBY	DOE	57-54	376-5652	yes
Tim Thompson	DOE	57-54	373-9257	yes
Jim Nauseo	DOE	A2-22	373-4365	No
Tom Poppiti	DOE	57-54	376-4550	No
David Holland	Ecology		736-3027	Yes
W. ABDUL	DOE-RL	57-54	372-2355	yes.
Bob Jim	Ecology	B5-18	736-5702	No
NEIL BROWN	DOE-RL	A0-51	372-2323	NO
ROBERT YASEK	DOE-RL	H0-12	372-1270	NO
Deborah Iwatate	FDH	A5-15	376-8856	Yes.
Russ Mackowski	LMHC		373 3885	NO
Phil LaMont	DOE-RL	A0-21	376-6117	yes
Carol Babel	DOE-RL	A2-22	373-9281	yes
Dennis Bowser	DOE-RL	A2-22	373-9566	YES
Richard McNulty	DOE-RL	A2-22	373-9304	yes
Bob Loberg	DOE-RL	A2-22		yes
Lina Pacheco				

ORP TPA Project Managers' Meeting
March 18, 1999

MEETING MINUTES

Attendance:

DOE
Wahed Abdul
Carol Babel
Dennis Bowser
Neil Brown
Dennis Irby
Phil LaMont
Bob Lober
Richard McNulty
Patty Morehouse
Jim Navarro
Carolina Pacheco
Jim Poppiti
Mark Ramsay
Hector Rodriguez
Jim Thompson
Robert Yasek

ECOLOGY
Suzanne Dahl
Dave Dougherty
Richard Heggen
David Holland
Bob Julian

CONTRACTORS
Lucinda Borneman, FDH
Deborah Iwatate, FDH
Kevin Kjarmo, E2
Mary Ann McLaughlin, FDH
Russ Murkowski, LMHC
Cyndi Nunn, Jacobs Engineering
Ana Sherwood, WMH

Action Items Generated:

ACTION	ACTIONEE	COMPLETION DATE
Contact P. Bengston concerning the public forums for privatization.	S. Dahl, J. Turner	3/18/99
Have correspondence control contact Shauna Berben at Ecology to resolve document distribution issue.	S. Dahl	
Provide an updated ORP organizational chart.	C. Nunn	
Provide FDH organizational chart.	M. McLaughlin	3/18/99
Provide information on organizational changes in the Office of River Protection to S. Dahl and set up meeting with Ecology to discuss changes and status update.	B. Lober/ J. Peschong	
Schedule meeting with S. Dahl and S. McKinney to discuss progress to date and review any draft SST retrieval sequence documents that might be available.	B. Lober	
Schedule meeting with Zelma Jackson and Dave Olson to discuss vadose zone activities. Copy Stan Leja on meetings.	B. Lober	3/8/99
Verify that S. McKinney has received updated version of the W-314 schedule.	T. Hoertkorn, J. Navarro	3/18/99
Schedule meeting with S. Dahl and D. Dougherty to discuss partnering meetings.	J. Thompson	
Send copy of 244-S DCRT Assessment report to T. Valero and R. Heggen.	A. Sherwood	1/31/99
Find out status of public involvement in cross-organizational team.	R. Gilbert	3/12/99
Provide NOC schedule to S. Dahl and T. Valero.	D. Bowser	1/23/99
Provide Lockheed organizational chart.	L. Borneman	
Provide R. Heggen an upcoming schedule of routine tank transfers and major transfers including which lines and vaults that will be used.	M. Ramsay/ J. Navarro	

Find out if Privatization Forum on March 24 has been advertised and is on the Public Involvement calendar prepared by Enid Reck.	C. Nunn	
Provide list of Ecology's Storage personnel.	K. Kjarmo	
Invite Ecology personnel related to Storage and Disposal to future Project Managers' Meetings.	C. Nunn	
Schedule Ecology's Storage and Disposal Project Meetings back to back and notify C. Nunn so J. Peschong can be scheduled to attend.	S. Dahl/ T. Valero	
Ensure DOE personnel have presented milestone information to Ecology representatives prior to IAMIT milestone review meeting.	C. Nunn	
Discuss draft change control forms for M-32-06 and M-32-08 with T. Valero.	R. Heggen	
Provide a field routing diagram of S, T, and U Tank Farms to R. Heggen.	C. Pacheco	
Assemble to appropriate Ecology team to discuss the waste acceptance criteria and related DQOs.	S. Dahl	
Find out the public involvement requirements for NOI.	B. Julian	
Research $9 million question from S. Dahl and report findings to B. Julian.	P. LaMont	

INTRODUCTION AND REVIEW OF ACTION ITEMS – HECTOR RODRIGUEZ, DOE-RL

H. Rodriguez suggested attendees introduce themselves since there were a lot of new faces around the table. He then reviewed the action items from the previous meeting.

R. Heggen requested a schedule of all upcoming routine tank transfers and a schedule of major transfers, specifically the next transfer after the current cross-site transfer. Mark Ramsay and Jim Navarro will provide this information.

S. Dahl provided a copy of Ecology's contact list for the Disposal Project (handout attached). K. Kjarmo will provide a contact list for the Storage Project personnel. She asked that they be invited to future meetings. C. Nunn will invite Ecology project personnel to future Project Managers' Meetings.

S. Dahl reported that the Privatization Forum is scheduled for March 24 at 7:00 p.m. If anyone has any questions about the Forum, contact Peter Bengtson or Joy Turner. C. Nunn will contact Enid Reck to be sure the March 24 Privatization Forum is on the Public Involvement Calendar.

S. Dahl will take ownership of correspondence control issue action item from previous meeting.

C. Nunn will bring updated ORP organizational chart to the next Project Managers' meeting.

Confusion exists over milestone reporting assignments for DOE personnel and Ecology personnel. S. Dahl and T. Valero will schedule Ecology's Storage and Disposal Project Meetings back to back and notify C. Nunn so J. Peschong can be scheduled to attend to determine the correct reporting structure.

TPA MILESTONE STATISTICS – MARY ANN MCLAUGHLIN, FDH

M. McLaughlin reviewed the major and interim milestones. There are 161 active milestones. The proposed vadose zone milestones will be included after they are finalized. The M-41 series will be removed once the Consent Decree is finalized after the public comment period.

C. Nunn will ensure DOE personnel have presented milestone information to Ecology prior to the Quarterly Milestone Review on April 27, 1999.

M-32-00, COMPLETE IDENTIFIED DANGEROUS WASTE TANK CORRECTIVE ACTIONS – ANA SHERWOOD, WMH

A. Sherwood distributed draft change control forms for M-32-06 and M-32-08. She explained the justification for deletion of each milestone and target dates (handouts attached). A. Sherwood provided the change control forms to R. Heggen for review by Ecology. R. Heggen stated that he would discuss the change requests with T. Valero.

A. Sherwood distributed a presentation related to 244-AR Vault (handout attached). Also provided minutes from May 7, 1992 meeting where Ecology agreed that 244-AR vault could be used as secondary containment for DST transfer lines (handout attached).

A. Sherwood distributed four sets of minutes from 1997 Project Managers' Meetings that need to be agreed upon by Ecology and placed in Administrative Record (handouts attached). The minutes were from the following dates: January 23, 1997; March 5, 1997; March 10, 1997; and April 29, 1997.

FY 1999 COST/SCHEDULE INFO – PATTY MOREHOUSE, DOE-RL

P. Morehouse was unable to give this update due to the meeting running behind schedule. C. Nunn asked R. Heggen and D. Dougherty (the only Ecology personnel present) if they needed to hear the presentation. They did not have any questions or comments. C. Nunn added that she would go over the budget section with S. Dahl after the meeting.

M-40-00, SAFETY ISSUE RESOLUTION – DENNIS IRBY, DOE-RL

D. Irby reviewed the status, issues, and planned activities. D. Irby reported on the SY-101 level rise. Transfer from SY-101 is expected to begin in September 1999.

M-41-00, INTERIM STABILIZATION – CAROLINA PACHECO, DOE-RL

C. Pacheco distributed a status sheet for interim stabilization (handout attached). Five tanks are currently being pumped which is a record number. U-103 tank start is scheduled for October 1, 1999. R. Heggen requested a field routing of the S, T, and U Tank Farms. C. Pacheco will send this to R. Heggen.

C. Pacheco reported that another cross-site transfer will take place in August 1999 originating at SY-102. In September 1999, a transfer will occur from SY-101 to SY-102.

M-43-00, TANK FARM UPGRADES – JIM NAVARRO, DOE-RL

J. Navarro reported on the status, issues, and planned activities for tank farm upgrades.

M-44-00, TANK WASTE CHARACTERIZATION – JIM THOMPSON, DOE-RL

J. Thompson reported on the status, issues, and planned activities for tank waste characterization.

M-45-00, SINGLE SHELL TANK CLOSURE – BOB LOBER AND WAHED ABDUL, DOE-RL

B. Lober reviewed the status of M-45-02D and M-45-09D. Both milestones are on schedule for 9/30/99.

W. Abdul provided update on C-106 sluicing (handout attached).

M-46-00, DOUBLE SHELL TANK SPACE EVALUATION – MARK RAMSAY, DOE-RL

M. Ramsay reported that a plan for DST space evaluation study was provided to Ecology in February. The big question is whether more double-shell tanks will need to be built.

M-50, 51, 60, 61-00, TREATMENT AND IMMOBILIZATION OF HANFORD TANK WASTE – NEIL BROWN, DOE-RL

N. Brown reported that BNFL deliverables are being received on schedule. Reviewed contract deliverables through May 1999. DOE has recommended to continue with BNFL contract through August 2000.

S. Dahl will assemble the appropriate Ecology team to discuss the Waste Acceptance Criteria and related DQOs.

M-90-00, IHLW AND ILAW STORAGE AND DISPOSAL FACILITIES – PHIL LAMONT, DOE-RL

P. LaMont suggested italicizing only the updated items in his section for future meeting packets. He reported that the draft Performance Objectives for the FY2001 Performance Assessment were provided to Ecology for review. NOI for Project W-464 was prepared and submitted January 15, 1999. B. Julian will find out the public involvement requirements for NOI.

OTHER: PERMITTING – DENNIS BOWSER AND RICK MCNULTY, DOE-RL

D. Bowser gave an update on the Clean Air Act.

R. McNulty provided a RCRA update. There are ongoing meetings for RCRA Part B for double-shell tanks.

OTHER: FSAR – DENNIS IRBY, DOE-RL

D. Irby reported that the Final FSAR is through Tier III review by the Office of River Protection.

OTHER: VADOSE ZONE – ROB YASEK, DOE-RL

R. Yasek reviewed the status of the proposed vadose zone milestones. S. Dahl noted that Ecology has received requests for public meetings for the Interim Stabilization Change Package.

OTHER: PUBLIC INVOLVEMENT – CYNDI NUNN, JACOBS ENGINEERING

C. Nunn reported that a tribal briefing on the Office of River Protection and the tank waste remediation system is being planned. S. Dahl suggested letting Ecology participate in the briefings.

Office of River Protection

Tri-Party Agreement

Project Managers' Meeting

U.S. Department of Energy

U.S. Environmental Protection Agency

Washington State Department of Ecology

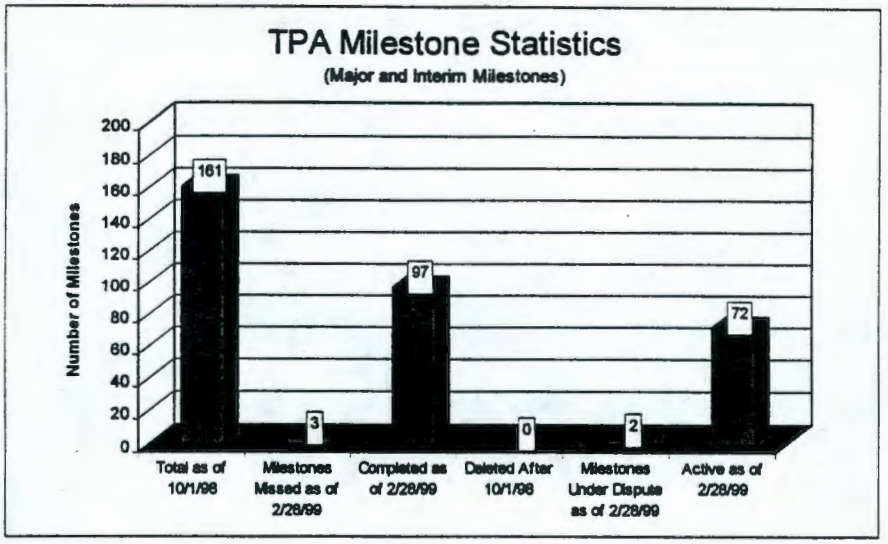
March 18, 1999

Agenda

Office of River Protection Tri-Party Agreement Project Managers' Meeting
March 18, 1999

TOPIC	DISCUSSION LEADS	TIME
Introduction	Hector Rodriguez/Suzanne Dahl	9:00
Review Previous PMM Action Items	Hector Rodriguez/Suzanne Dahl	9:05
FY 1999 Cost, Schedule, and Tri-Party Agreement Milestone Performance Overview	Patty Morehouse	9:20
FY 1999 ORP Tri-Party Agreement Milestones Status/Issues/Planned Activities	Mary Ann McLaughlin	9:30
M-32-00, Complete Identified Dangerous Waste Tank Corrective Actions	Ana Sherwood/Tony Valero	9:45
M-40-00, Safety Issue Resolution	Dennis Irby/Tony Valero	9:55
M-41-00, Interim Stabilization	Lina Pacheco/Casey Ruud	10:05
M-43-00, Tank Farm Upgrades	Jim Navarro/Dick Heggen	10:30
M-44-00, Tank Waste Characterization	Jim Thompson/Dave Dougherty	10:45
M-45-00, Single-Shell Tank Closure	Russ Harwood/Scott McKinney	11:00
M-46-00, Double-Shell Tank Space Evaluation	Mark Ramsay/Scott McKinney	11:15
M-50, 51, 60, 61-00, Treatment and Immobilization of Hanford Tank Waste	Neil Brown/Suzanne Dahl	11:30
M-90-00, Complete Acquisition of Facilities for Interim Storage of IHLW and Storage/Disposal of ILAW	Phil LaMont/Bob Julian	11:45
Other		Noon
• Permitting (RCRA, CAA)	Dennis Bowser/Rick McNulty	
• FSAR	Steve Wiegman	
• Vadose Zone	Dave Olson	
• Public Involvement	Cyndi Nunn	
Closing Comments/Action Item Recap	Hector Rodriguez/Suzanne Dahl	12:15

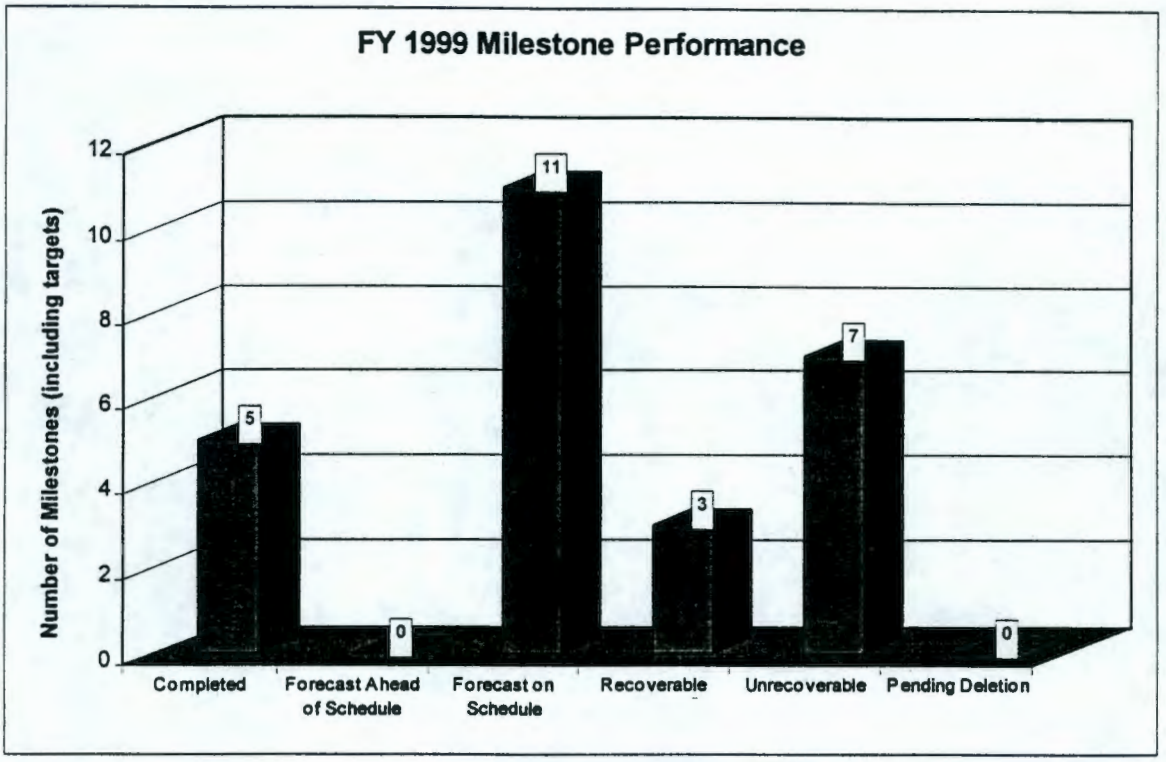
TPA Milestone Overview

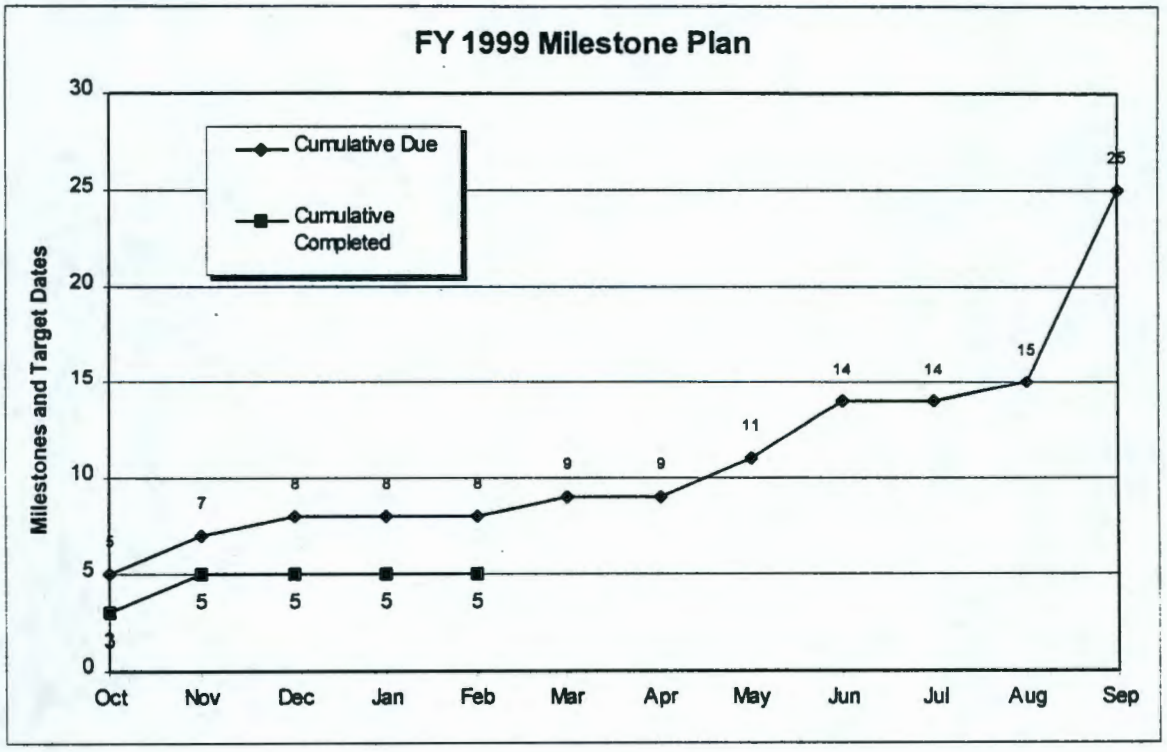


	Milestone Completion Date	Total Milestones as of 10/1/98	Milestones Completed as of 2/28/99	Milestones Deleted After 10/1/98	Milestones Under Dispute as of 2/28/99	Milestones Active as of 2/28/99	Milestones Missed as of 2/28/99
M-40-00 Mitigate/Resolve Tank Safety issues for High Priority Watchlist Tanks	9/30/2001	19	17	0	1	2	0
M-41-00 Complete Single Shell Tank Interim Stabilization	9/30/2000	19	12	0	1	7	2
M-43-00 Complete Tank Farm Upgrades	6/30/2005	20	15	0	0	5	0
M-44-00A Double and Single Shell Tank Characterization	9/30/2002	34	19	0	0	15	0
M-45-00** Complete Closure of all Single Shell Tank Farms	9/30/2024	29	11	0	0	18	1
M-46-00 Double Shell Tank Space Evaluation	9/30/2003	20	10	0	0	10	0
M-50-00 Complete Pretreatment Processing of Hanford Tank Wastes	9/30/2024	4	2	0	0	2	0
M-51-00 Complete Vitrification of Hanford High Level Tank Waste	12/31/2028	4	2	0	0	2	0
M-60-00 (primary path) Complete Pretreatment and Immobilization of Hanford Low Activity Tank Waste	12/31/2024	(12)*	8	0	0	(4)*	0
M-61-00* (alternate path) Complete Pretreatment and Immobilization of Hanford Low Activity Tank Waste	12/31/2028	4	0	0	0	4	0
M-90-00 Interim Storage and Disposal of LAW and Interim Storage of HLW	TBD	8	1	0	0	7	0
Total		161	97	0	2	72	3

*DOE abandoned the primary path per letter dated June 18, 1998. M-60-00 milestones were automatically deleted from the Tri-Party Agreement, and M-61-00 milestones were activated under the alternate path (Ecology and EPA stated their disagreement with this footnote at the July 28 1998 IAMIT meeting).

** Does not include proposed groundwater/vadose zone milestones M-45-50 through M-45-60, which are in public comment through 4/1/99.


FY 1999 Milestone Performance
Number of Milestones (including targets)
12
10
8
6
4
2
0
5
0
11
3
7
0
Completed
Forecast Ahead of Schedule
Forecast on Schedule
Recoverable
Unrecoverable
Pending Deletion


FY 1999 Milestone Plan
Milestones and Target Dates
Cumulative Due
Cumulative Completed
30
25
20
15
10
5
0
5
7
8
8
8
9
9
11
14
14
15
25
3
5
5
5
5
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep

Fiscal Year 1999 Tri-Party Agreement Milestone Status

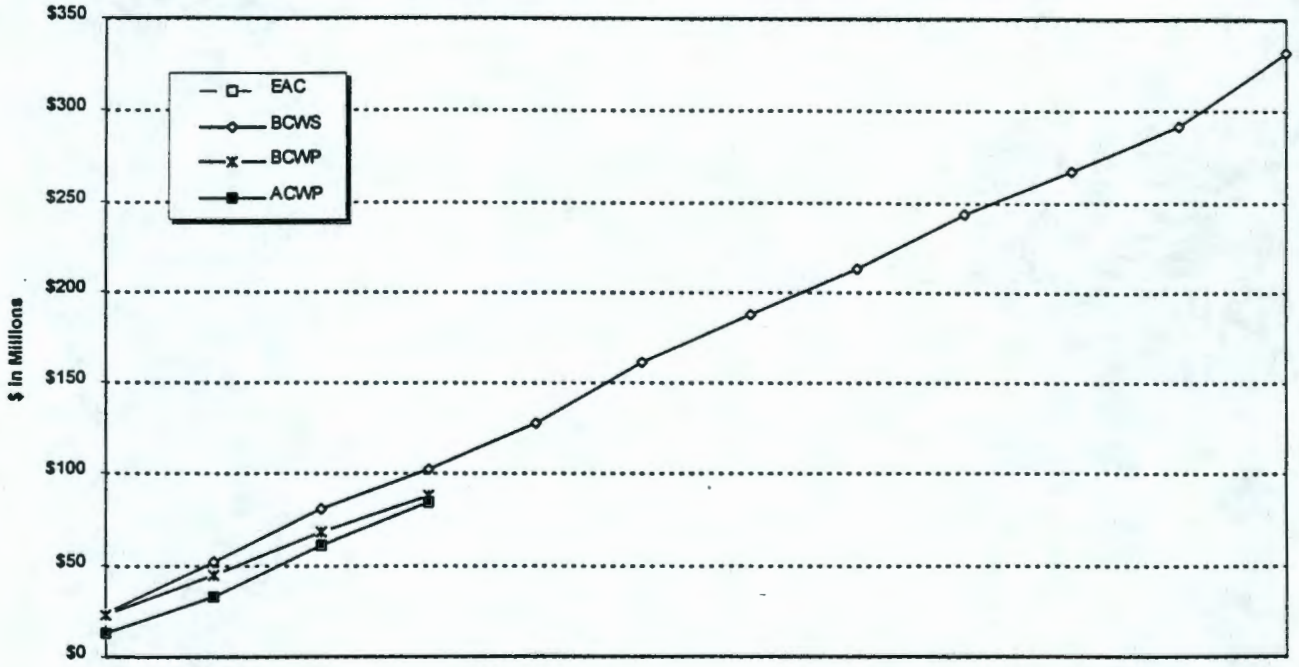
Milestone	Description	Due Date	Completed	Forecast		Recoverable	Unrecoverable	Pending Deletion
				Ahead of Schedule	On Schedule			
M-32-00	Complete Identified Dangerous Waste Tank Corrective Actions.	9/30/99				X		
M-32-06	Complete 244-AR-Vault Interim Status Tank Actions.	TBD				X		
M-32-06-T01	Complete and Submit Integrity Assessment Report and Identified Upgrades for 244-AR-Vault Interim Status Tank System. Provide a Schedule to Address any Deficiencies Related to Tank System Compliance.	TBD				X		
M-40-12	Resolve Nuclear Criticality Safety Issue.	9/30/99			X			
M-41-22	Start Interim Stabilization of 6 SSTs.	9/30/97					X	
M-41-23	Start Interim Stabilization of 8 SSTs.	3/31/98					X	
M-41-24	Start Interim Stabilization of 9 SSTs.	9/30/98					X	
M-41-25	Start Interim Stabilization of 3 SSTs.	3/31/99					X	
M-41-26	Start Interim Stabilization of 2 SSTs.	9/30/99					X	
M-41-27-T03	Complete Salt Well Pumping of 5 SSTs.	9/30/99					X	
M-41-27-T04	Complete Salt Well Pumping of 8 SSTs.	9/30/99					X	
M-43-12	Start Construction for Upgrades in the First Tank Farm.	6/30/99	X					
M-44-13C	Submit Draft WIRD to Ecology for FY 2000.	6/30/99			X			
M-44-14C	Submit Final WIRD for FY 2000 to Ecology.	8/31/99			X			
M-44-15C	Issue Characterization Deliverables Consistent with WIRD Developed for FY 1999.	9/30/99			X			
M-44-16C	Complete Input of Characterization Information for HLW Tanks per WIRD Sampling into Electronic Database. Offsite Access to be Available to EPA and Ecology.	9/30/99			X			
M-45-02D	Submit Annual Update of SST Retrieval Sequence Document for Ecology Approval.	9/30/99			X			
M-45-03A	Initiate Sluicing Retrieval of C-106.	10/31/97	X					
M-45-09D	Submit Annual Progress Reports on the Development of Waste Tank Leak Monitoring and Mitigation Activities in Support of M-45-08.	9/30/99			X			
M-45-10A-T1	Submit DOE Approved DQO for Tank Waste Retrieval.	5/31/99			X			
M-46-00F	Double Shell Tank Space Evaluation.	9/30/99			X			
M-46-01E	Concurrence of Additional Tank Acquisition.	11/30/98	X					
M-50-04-T02	Initiate Definitive Design of the HLW Pretreatment Facility.	11/30/98	X					
M-51-03-T02	Initiate Definitive Design of the HLW Vitrification Facility.	12/31/98	X					
M-51-04B-T1	Submit Approved DQO for HLW Feed Staging.	5/31/99			X			
M-90-12	Submit Revised Canister Storage Facility Part A Dangerous Waste Permit Application to Ecology.	6/30/99			X			
TOTAL			5	0	11	3	7	0

Active FY 1999 Change Requests

Change Request M-41-98-01	Submitted to Ecology July 2, 1998. Disapproved by Ecology on July 16, 1998. DOE invoked dispute on July 2, 1998; elevated to IAMIT on August 20, 1998. Dispute extended at Director level pending outcome of M-41-22 and M-41-23 discussions.
Change Request M-45-98-03 SST Corrective Action Groundwater/Vadose Zone	Dispute resolution for proposed SST corrective action elevated to IAMIT on August 21, 1998. Dispute resolution and corrective action request suspended on September 11, 1998. Negotiations scheduled October 7, 1998 through December 4, 1998. Extended through December 11, 1998. Dispute reinstated December 18, 1998 at IAMIT level. Dispute resolved January 8, 1999. Change package in public comment February 16, 1999 through April 1, 1999.
M-40-07 Dispute	The dispute concerning completion of Interim Milestone M-40-07 (C-103 Ventilation System) was invoked on April 9, 1997, and was extended at the IAMIT level through January 26, 1999. The dispute will be resolved when the Interim Stabilization Consent Decree is finalized.

Tank Waste Remediation System

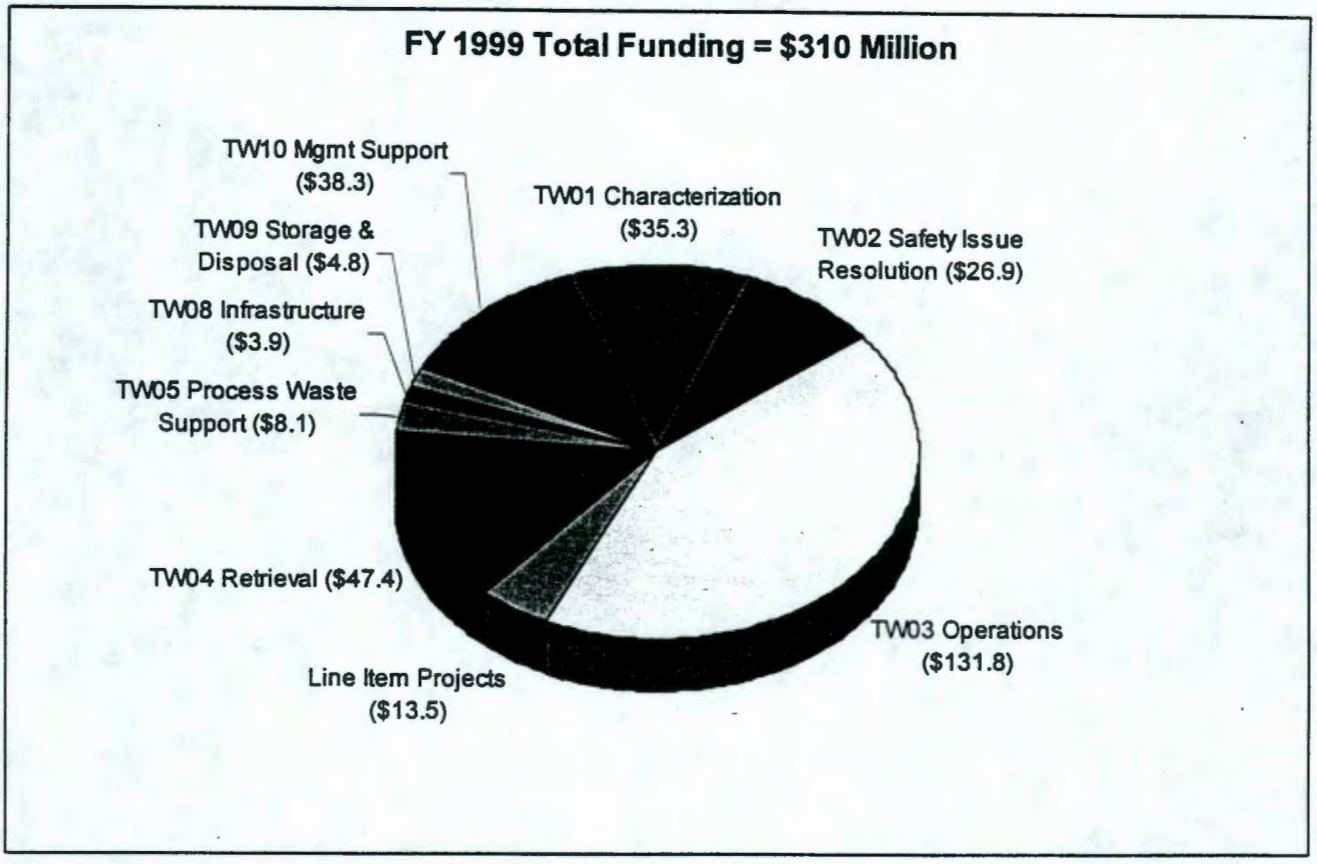
FY 1999 Cost/Schedule Performance - All Fund Types – Cumulative to Date Status



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
EAC												
BCWS	23.7	51.5	80.6	102.2	127.6	161.0	186.9	212.3	243.0	266.8	291.6	332.2
BCWP	22.2	44.5	67.9	88.1								
ACWP	12.7	32.6	60.8	84.1								
SV	(1.5)	(7.0)	(12.7)	(14.1)								
CV	9.5	11.9	7.1	4.0								

*This information is contained in the Hanford Site Performance Report, available on the Internet under DOE Hanford's Home Page at www.hanford.gov/hspr/toc.htm. Slight differences in totals may be due to rounding.

FY 1999 Cost & Schedule Performance

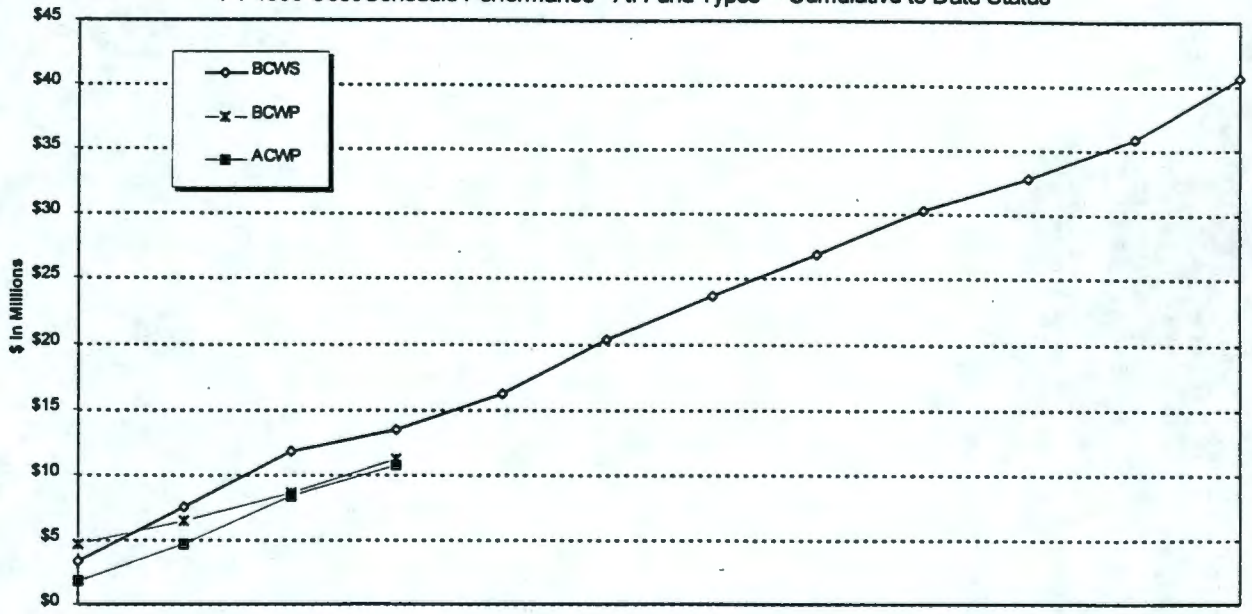


FY 1999 Cost & Schedule Performance

				FYTD					PTS
				BCWS	BCWP	ACWP	SV	CV	Cur BSLN
1.1.1.1	Management Support		Expense	12.0	9.3	8.3	(2.7)	1.0	38.7
TW10			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal 1.1.1.1		12.0	9.3	8.3	(2.7)	1.0	38.7
WASTE STORAGE									
1.1.2.1	Tank Farm Operations		Expense	39.6	37.3	36.6	(2.3)	0.7	131.9
TW03			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	3.4	3.3	3.6	(0.1)	(0.3)	11.5
		Subtotal 1.1.2.1		43.0	40.6	40.2	(2.4)	0.4	143.4
1.1.2.2	Tank Safety Issue Resolution		Expense	6.6	6.2	5.1	(0.4)	1.1	19.9
TW02			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal 1.1.2.2		6.6	6.2	5.1	(0.4)	1.1	19.9
1.1.2.4	Tank Waste Characterization		Expense	13.5	11.3	10.7	(2.2)	0.6	40.8
TW01			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal 1.1.2.4		13.5	11.3	10.7	(2.2)	0.6	40.8
TOTAL WASTE STORAGE			Expense	59.7	54.8	52.4	(4.9)	2.4	192.6
			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	3.4	3.3	3.6	(0.1)	(0.3)	11.5
		Total Waste Storage		63.1	58.1	56.0	(5.0)	2.1	204.1
WASTE DISPOSAL									
1.1.3.1	Retrieval		Expense	17.0	11.4	12.6	(5.6)	(1.2)	52.1
TW04			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	1.1	1.4	2.0	0.3	(0.6)	4.1
		Subtotal 1.1.3.1		18.1	12.8	14.6	(5.3)	(1.8)	56.2
1.1.3.4	Immobilized Tank Waste		Expense	1.6	1.5	0.9	(0.1)	0.6	4.7
TW09	Storage & Disposal		CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal 1.1.3.4		1.6	1.5	0.9	(0.1)	0.6	4.7
1.1.3.5	Process Waste Support		Expense	3.2	2.3	2.0	(0.9)	0.3	8.1
TW05			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal 1.1.3.5		3.2	2.3	2.0	(0.9)	0.3	8.1
1.1.3.6	Privatization Infrastructure		Expense	1.2	1.2	0.5	0.0	0.7	4.0
TW08			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	0.6	0.5	0.3	(0.1)	0.2	9.0
		Subtotal 1.1.3.6		1.8	1.7	0.8	(0.1)	0.9	13.0
TOTAL WASTE DISPOSAL			Expense	23.0	16.4	16.0	(6.6)	0.4	68.9
			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	1.7	1.9	2.3	0.2	(0.4)	13.1
		Total Waste Disposal		24.7	18.3	18.3	(6.4)	0.0	82.0
HTI			Expense	2.4	2.4	1.5	0.0	0.9	7.4
			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal HTI		2.4	2.4	1.5	0.0	0.9	7.4
Tank Waste Remediation System			Expense	49.5	42.2	30.8	(7.3)	11.4	304.3
			CENRTC	0.0	0.0	0.0	0.0	0.0	0.0
			GPP/LI	2.1	2.3	1.8	0.3	0.5	24.3
		TWRS Total		51.6	44.5	32.6	(7.0)	11.9	328.6

Tank Waste Characterization - TW01

FY 1999 Cost/Schedule Performance - All Fund Types -- Cumulative to Date Status



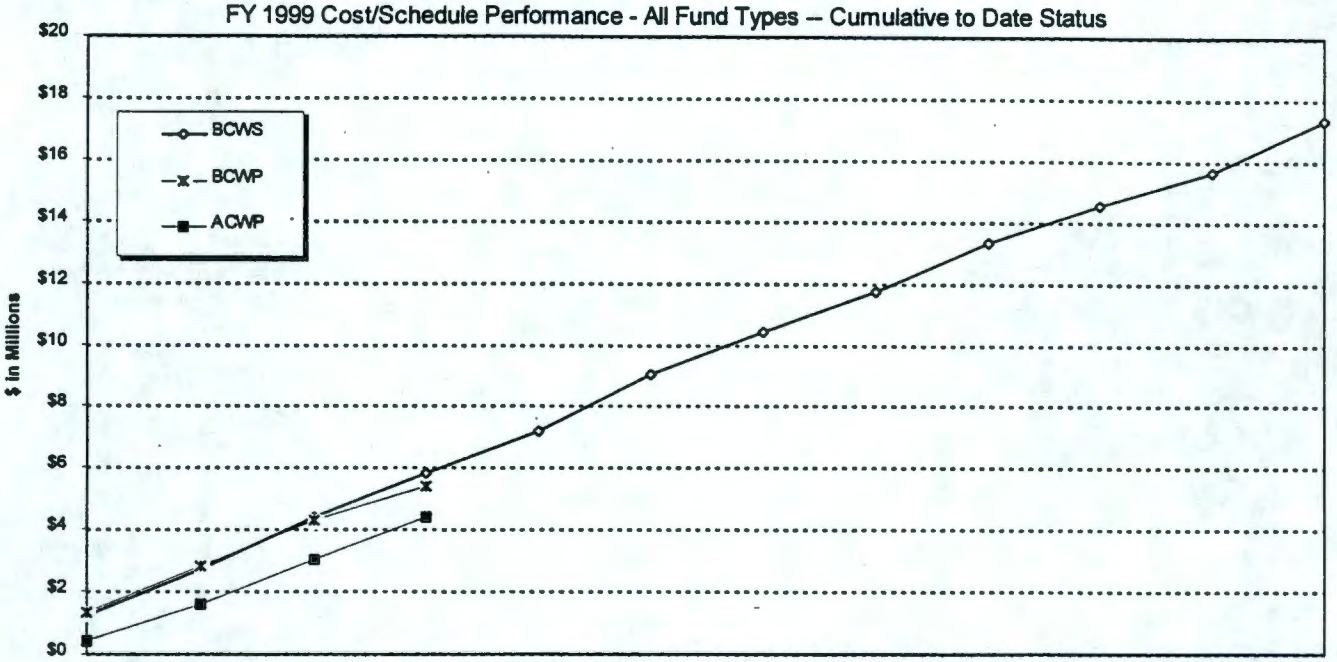
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	3.3	7.5	11.7	13.4	16.2	20.3	23.6	26.8	30.3	32.8	35.8	40.6
BCWP	4.6	6.4	8.5	11.2								
ACWP	1.8	4.6	8.3	10.7								
SV	1.2	(1.0)	(3.2)	(2.2)								
CV	2.8	1.8	0.2	0.5								

Note: Data indicates PHMC data only.

FY 1999 Cost & Schedule Performance

Tank Safety Issue Resolution - TW02

FY 1999 Cost/Schedule Performance - All Fund Types -- Cumulative to Date Status



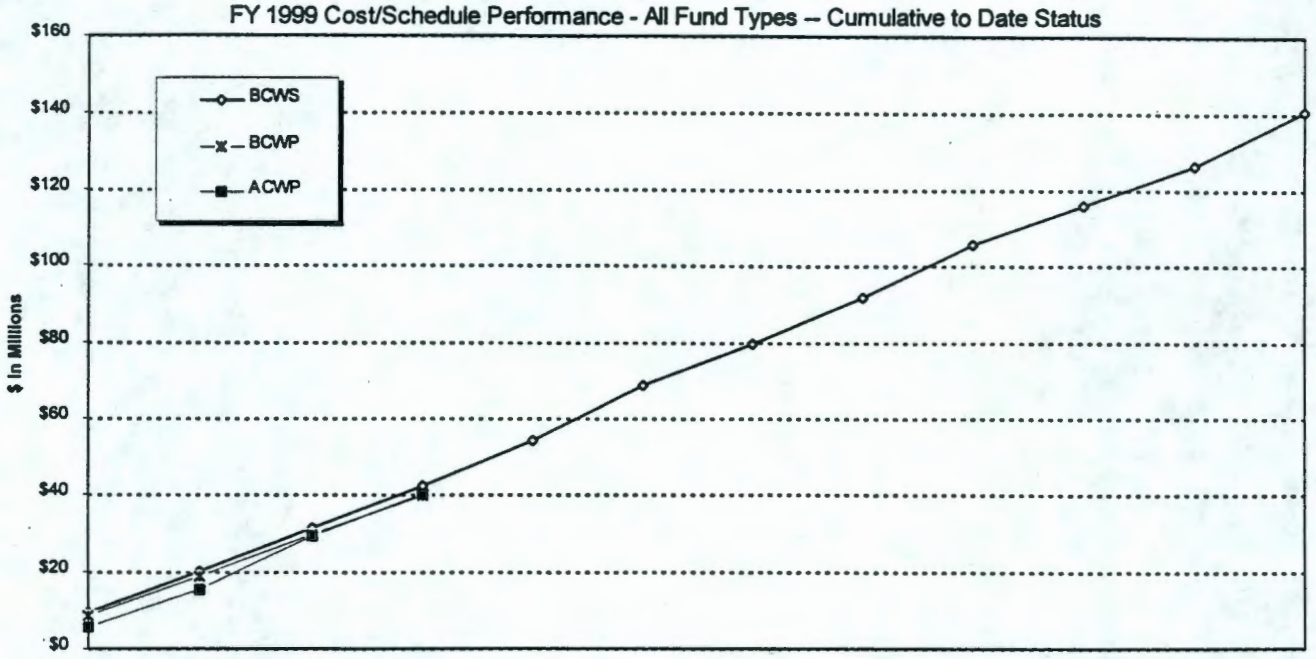
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	1.2	2.7	4.4	5.8	7.2	9.0	10.4	11.7	13.3	14.5	15.6	17.3
BCWP	1.3	2.8	4.3	5.4								
ACWP	0.4	1.6	3.0	4.4								
SV	0.0	(0.1)	(0.1)	(0.4)								
CV	0.6	1.1	1.3	1.0								

Note: Data indicates PHMC data only.

FY 1999 Cost & Schedule Performance

Tank Farms Operations - TW03

FY 1999 Cost/Schedule Performance - All Fund Types -- Cumulative to Date Status

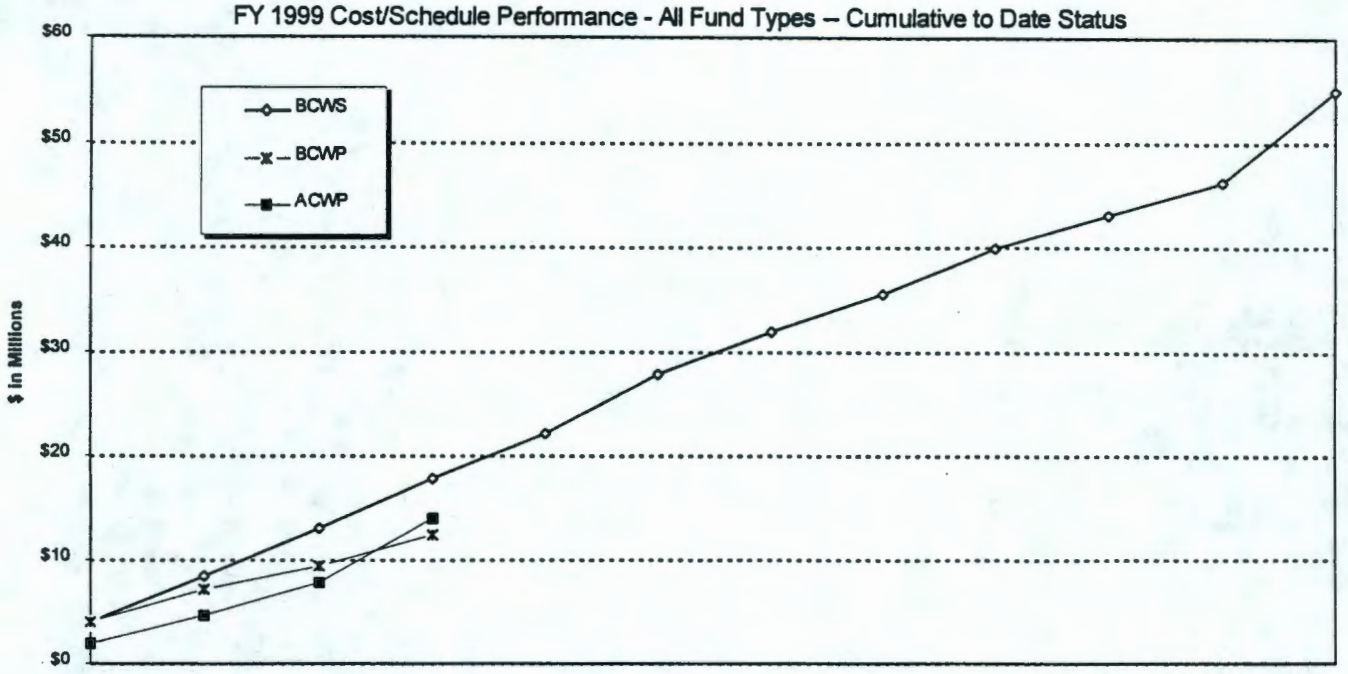


	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	9.3	19.8	31.3	42.3	54.0	68.2	79.3	91.4	105.7	115.7	126.2	140.6
BCWP	8.3	18.5	29.4	39.8								
ACWP	5.6	15.3	29.3	40.0								
SV	(1.0)	(1.3)	(1.9)	(2.4)								
CV	2.8	3.2	0.1	(0.2)								

Note: Data indicates PHMC data only.

Retrieval - TW04

FY 1999 Cost/Schedule Performance - All Fund Types -- Cumulative to Date Status

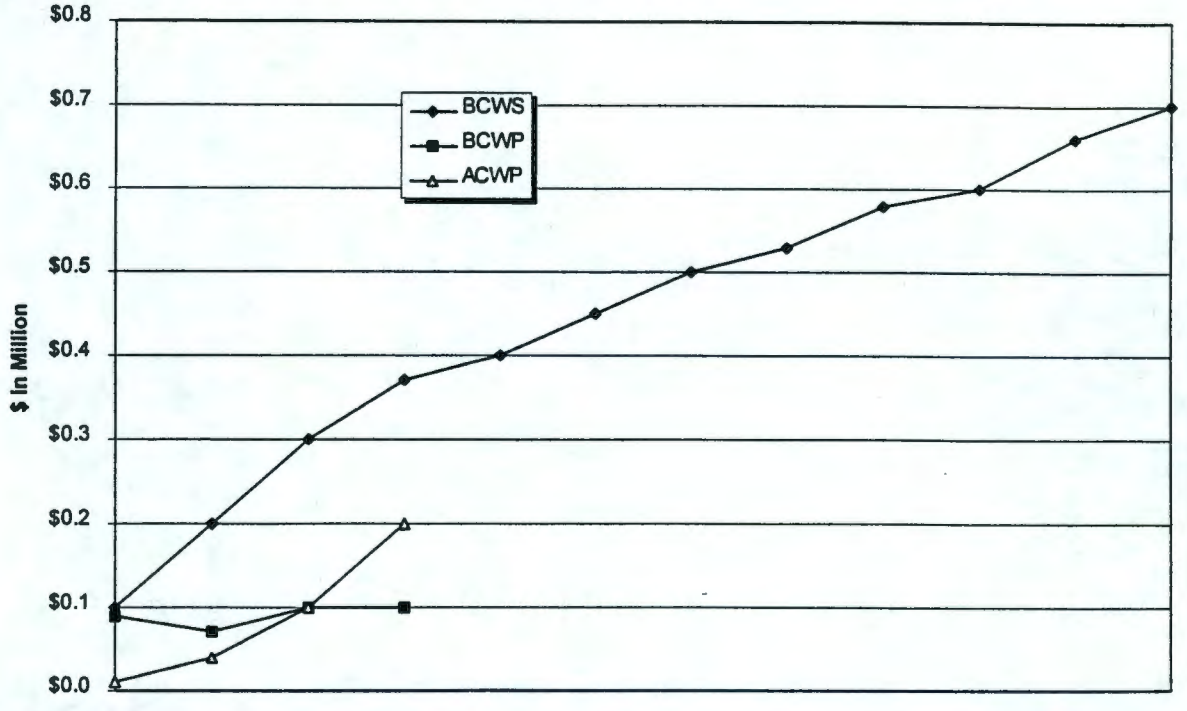


	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	4.0	8.4	13.0	17.7	22.0	27.7	31.8	35.5	39.9	43.1	46.3	55.0
BCWP	3.9	7.1	9.4	12.4								
ACWP	1.9	4.6	7.8	13.9								
SV	(0.2)	(1.5)	(3.6)	(5.3)								
CV	2.0	2.2	1.6	(1.6)								

Note: Data indicates PHMC data only.

Process Waste Support - TW05

FY 1999 Cost/Schedule Performance - All Fund Types -- Cumulative to Date Status

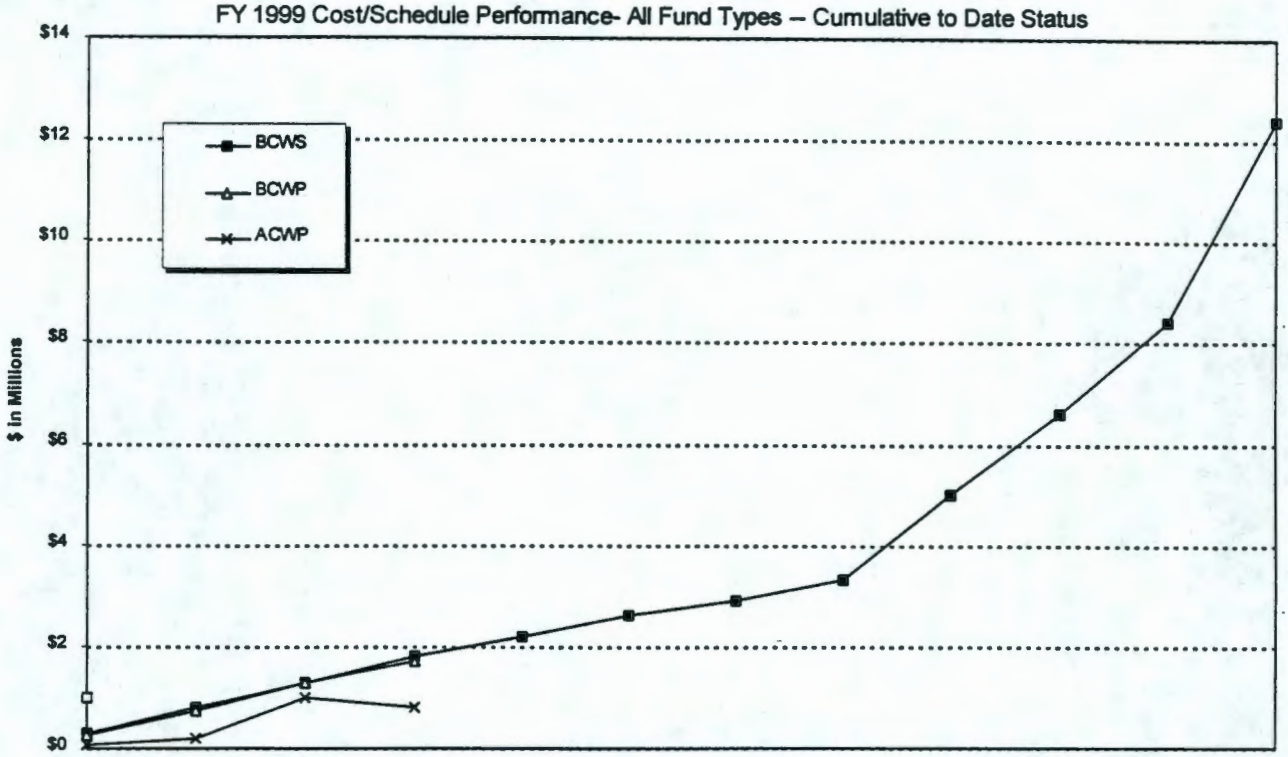


	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	0.10	0.20	0.30	0.37	0.40	0.45	0.50	0.53	0.58	0.60	0.66	0.70
BCWP	0.09	0.07	0.10	0.10								
ACWP	0.01	0.04	0.10	0.20								
SV	(0.01)	(0.10)	(0.20)	(0.20)								
CV	(0.07)	0.03	(0.01)	(0.03)								

Note: Data indicates PHMC data only.

Privatization Infrastructure - TW08

FY 1999 Cost/Schedule Performance- All Fund Types -- Cumulative to Date Status

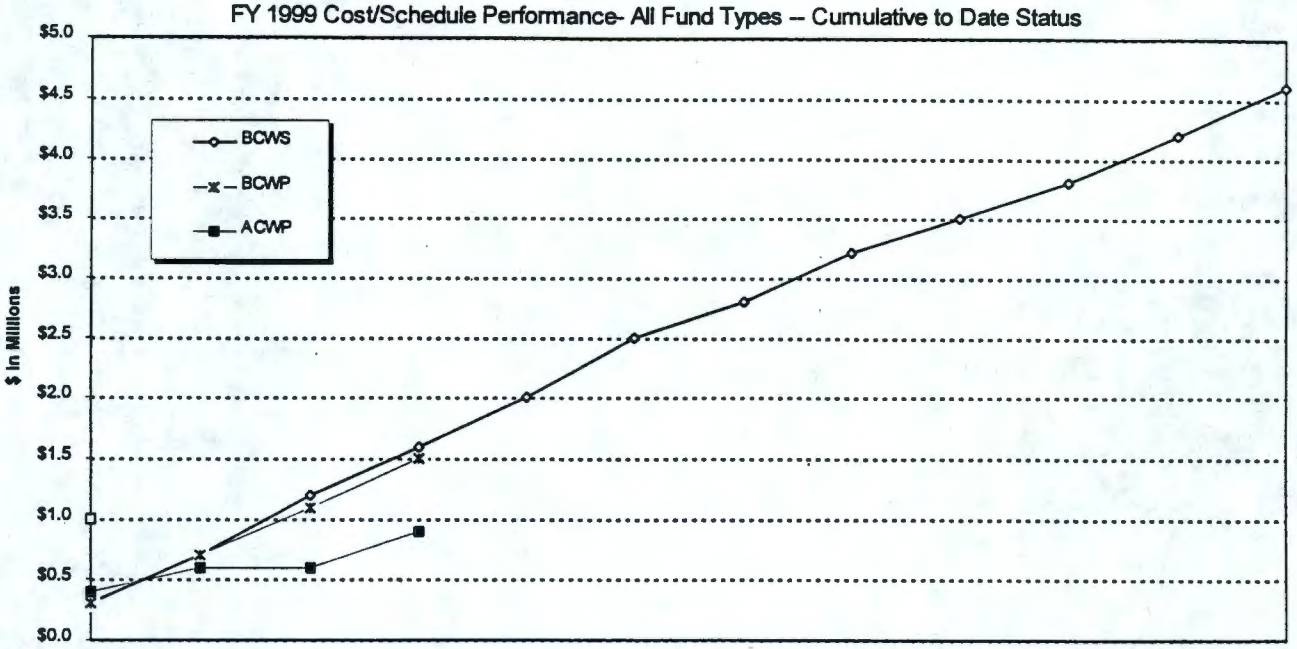


	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	0.30	0.80	1.30	1.80	2.20	2.60	2.90	3.30	5.00	6.60	8.40	12.40
BCWP	0.26	0.75	1.30	1.70								
ACWP	0.05	0.20	1.00	0.80								
SV	(0.05)	(0.06)	(0.02)	(0.12)								
CV	0.20	0.60	0.40	0.90								

Note: Data indicates PHMC data only.

Immobilized Tank Waste Storage & Disposal - TW09

FY 1999 Cost/Schedule Performance- All Fund Types -- Cumulative to Date Status

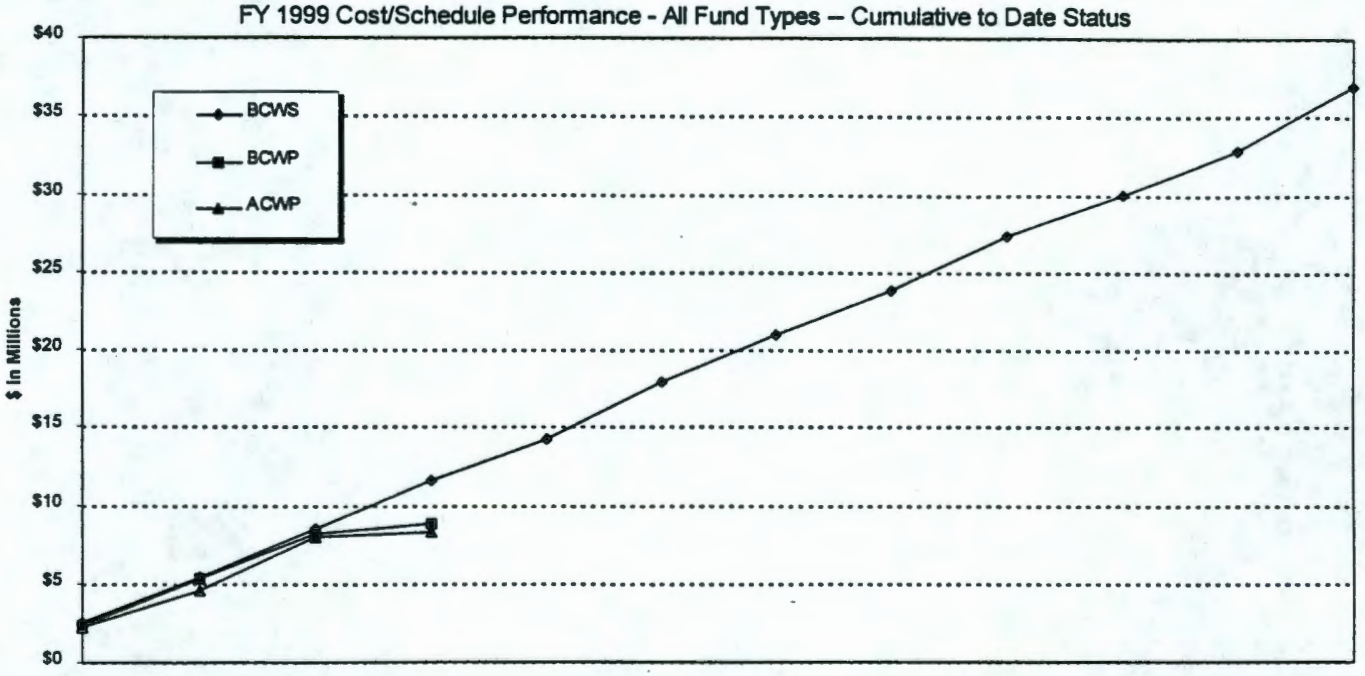


	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	0.30	0.70	1.20	1.60	2.00	2.50	2.80	3.20	3.50	3.80	4.20	4.60
BCWP	0.30	0.70	1.10	1.50								
ACWP	0.40	0.60	0.60	0.90								
SV	0.00	(0.01)	(0.05)	(0.08)								
CV	(0.10)	0.20	0.50	0.60								

Note: Data indicates PHMC data only.

Management Support - TW10

FY 1999 Cost/Schedule Performance - All Fund Types -- Cumulative to Date Status



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BCWS	2.50	5.40	8.50	11.50	14.20	17.90	20.90	23.80	27.30	29.90	32.80	36.90
BCWP	2.30	5.30	8.20	8.80								
ACWP	2.20	4.50	7.90	8.30								
SV	(0.20)	(0.20)	(0.30)	(2.70)								
CV	0.07	0.80	0.30	0.50								

Note: Data indicates PHMC data only.

FY 1999 Cost/Schedule Variance Summary
Through January 1999

PBS	Description and Cause	Impact/Corrective Action
TW01 Tank Waste Characterization	Cost Variance (+5.1%): The favorable cost variance is due to efficiencies in management and engineering activities with an offsetting negative cost variance in sampling and laboratory analysis. Schedule Variance (-16.3%): The unfavorable schedule variance is due to delays in planned core sampling activities caused by inclement weather (wind).	Corrective Action: Underruns in management and engineering will offset increased sampling costs. Discretionary spending will be controlled to maintain the cost variance within the threshold. Corrective Action: Sampling schedule is being revised consistent with recent funding reductions.
TW02 Tank Safety Issue Resolution	Cost Variance (+18.3%) The favorable cost variance is due to a lag in accruing outstanding costs or receipt and approval of existing invoices. Schedule Variance (-6.2%): Within the 7.5% threshold.	Corrective Action: Accruals are being made. The positive cost variance will continue to decrease as procurement activities become current.
TW03 Tank Farm Operations	Cost Variance (-0.5%): Within the 5.0% threshold. Schedule Variance (-5.8%): Within the 7.5% threshold.	Corrective Action: None required.
TW04 Retrieval Project	Cost Variance (-13.0%): The unfavorable cost variance is due to: 1. HTI cost transfer to EM-50 did not occur. 2. Incorrect/missing accruals for subcontracts. 3. General equipment repair funding is being consumed earlier than planned. **Schedule Variance (-30.1%): The unfavorable schedule variance is due to:** 1. Closeout of W-151 activities. 2. C-106 sluicing operations have been placed on hold due to the organic vapor issue. 3. Retrieval engineering work not started due to unavailability of resources and procedural problems encountered in the 222-S Lab. 4. Vadose Zone Characterization plan has been delayed pending TPA negotiations; borehole decommissioning delayed to allow additional groundwater sampling.	Corrective Action: 1. Cost allocation will be corrected in February. 2. Accrual issue is being addressed by PHMC. 3. None required. Corrective Action: 1. Change requests are in process to closeout activities and to defer work remaining work scope to FY 2000. 2. Evaluating potential to accelerate schedule by conducting sluicing and data evaluation in parallel. 3. Obtained additional resources; 222-S Lab problems resolved. 4. Change request will update schedule to reflect results of TPA negotiations.

PBS	Description and Cause	Impact/Corrective Action
TW05 Process Waste Support	Cost Variance (-22.9%): The unfavorable cost variance is due to effort required to complete FY 1998 ICD revisions was greater than planned; subcontract invoice was received sooner than expected. Schedule Variance (-59.9%): The unfavorable schedule variance is due to pending T Plant action to disposition the waste treatability samples from FY 1998. FY 1999 ICD updates have started slower than planned.	Corrective Action: Complete and closeout FY 1998 ICDs in February. Corrective Action: Continue to work with Waste Management Hanford to dispose of samples. Initiated 6 ICD interface meetings in January; remainder scheduled for February.
TW08 Privatization Infrastructure	Cost Variance (+51.3%): The favorable cost variance results from planned activities requiring less resources that planned, accrual reversals, delays in receipt of enterprise company costs. Schedule Variance (-6.7%): Within the 7.5% threshold.	Corrective Action: Accrual issue is being addressed by PHMC.
TW09 Immobilized Tank Waste	Cost Variance (+41.1%): The favorable cost variance is due to delayed billings and accruals. Schedule Variance (-5.3%): Within the 7.5% threshold.	Corrective Action: Accrual issue is being addressed by PHMC.
TW10 Management Systems	Cost Variance (+6.0%): Majority of the favorable cost variance results from personnel planned under TW10, supporting tasks under other PBS, i.e., saltwell pumping. Schedule Variance (-23.0%): The unfavorable schedule variance is primarily due to the failure to record the performance on fee.	Corrective Action: None required. Corrective Action: Fee performance will be recorded in February.

Milestone M-32-00, "Complete Identified Dangerous Waste Tank Corrective Actions"

DST INTERIM MILESTONE WITHIN M-32 HAS BEEN COMPLETED. DST ASSESSMENT ACTIVITIES LISTED BELOW WERE NOT INCORPORATED INTO THE MILESTONE.

Status:

- Completed 244-S DCRT assessment report.

Planned Activities:

- Complete UT examination of Tank AN-105.
- Begin field activities for S-304 Catch Tank.
- Begin field preparations for Tank AY-102 UT.

Milestone M-40-00, "Mitigate/Resolve Tank Safety Issues for High Priority Watchlist Tanks"

Status:

- Work on M-40-12 "Resolve Nuclear Criticality Safety Issue" is on schedule (9/99).

Issues:

- M-40-07 dispute to be resolved with the signing of the Interim Stabilization Consent Decree.
- Level rise in SY-101 has a potential to impact M-40-00 for that tank.

Planned Activities:

- Review SY-101 Level Rise Remediation Project Plan for TPA milestone or other program impacts.
- Submit organic solvent documentation to DOE-HQ to resolve safety issue.
- Continue to refine the analysis tool and framework for DST and SST safety issue resolution and removing tanks from the Watchlist.

Milestone M-41-00, "Complete Single Shell Tank Interim Stabilization"

Status:

- Single-Shell Tanks (SSTs) 241-T-104, 241-T-110, 241-SX-104, and 241-SX-106 are being interim stabilized.

- Total gallons of liquid waste pumped from June 1, 1998 (as of 1/19/99): T-104 pumped 26,747 gallons, T-110 pumped 20,926 gallons, SX-104 pumped 54,239 gallons, and SX-106 pumped 21,683 gallons.
- Engineering and Field preparation work in progress to support Tanks S-102, S-103, and S-106 pump starts.
- On December 15, 1998, RL received a summary of the proposed Rev. 3 technical scope cost and schedule baseline for SST Interim Stabilization (IS).
- Subsequent to obtaining DOE Headquarters management, EM-30, approval of the schedule and funding requirements enclosed for the proposed consent decree, DOE transmitted its proposal to the State of Washington on December 18, 1998.

Issues:

- The January 15, 1998, forecast completion date for Rev. 3 of SST IS Project Plan has been reforecast for January 29, 1999. Thus, extending RLs ongoing detail review of the basis of estimate by a minimum of 2 weeks.

Planned Activities:

- Finalize negotiations with the State of Washington.
- Complete RLs review of the detail basis of estimate and Rev. 3 of the Project Plan and establish a technical scope, cost and schedule baseline for the SST IS Project.
- Prepare S-102, S-103, and S-106 for FY99 pumping starts.
- Prepare U-Farm for an initial U-Farm tank start by October 1999.
- Determine method for retrieval of organic layer in Tank 241-C-103.

Milestone M-43-00, "Tank Farm Upgrades"

- M-43-11, "Provide the W-314 Project Construction Schedule to Ecology" (9/30/98)

  Status:

  - Submitted letter to WDOE transmitting schedule on August 20, 1998.
  - Submitted letter to WDOE notifying completion of M-43-12 on August 6, 1998, due on September 30, 1999.
  - Completed the design of AZ Tank Farm Upgrades in September 1998.

Issues:

- The project submitted a re-baselining report on January 15, 1999, for all its Phase 1 activities due to the new BNFL milestones, changes to the project 200 East package, and to capture tank farm resource availability issues. A review of the report by RL has been initiated.

Planned Activities:

- Complete design of the Master Pump Shutdown Package by February 2000.
- Complete design activities for the new "200E Waste Transfer System" by August 1999.
- Continue construction activities on the AN Farm Upgrades package, complete by July 2002.

Milestone M-44-00A, "Issue Tank Characterization Reports (TCRs) Based on Process Knowledge, Prior Characterization Data, and Validated Empirical Data Acquired After May 1989 for 177 Hanford High Level Waste Tanks"

Status:

- Initial draft is being prepared as the first step in development of the FY 2000 WIRD. The draft WIRD is due for submittal to DOE-RL and Ecology in June 1999.
- Obtained one grab sample from tank TX-113 and obtained a vapor sample from U-102 air filter. Sampling status as of February 28, 1999 is as follows:

	Tanks Scheduled/Completed	Samples Scheduled/Complete	FY 1999 Commitment
Auger	0/0	0/0	0
Push	1/0	3/2	21
Rotary	2/1	5/1	
Vapor	0/0	0/0	0
Grab	6.2/5.2	6.2/5.2	21

- Laboratory Analytical Reports (LARs) were completed and accessible on the Tank Characterization Database for tanks AW-101 and U-107.
- Plan to deliver a total of 17 new and revised Tank Characterization Reports (TCRs) for FY 1999, currently 46.4% complete.

Privatization:

- The final shipment of AZ-102 was staged on February 19 and shipped on February 22, 1999. The AZ-102 shipment contained 200 grams of tank solids and a total shipping volume of 4 liters.
- The final shipment of C-104 occurred on March 3, 1999. This completed the ICD-23 requirements for FY-1999, and partially completed Performance Agreement TWR 6.2.4.

Sampling:

- Investigation into cause for RGS sampler failure revealed a generic problem with consistency of materials in pintle rod, retainer ring and assembly of the samplers. A near term solution has been implemented that will ensure sufficient, reliable samplers for SY-101 RGS samples, TX-113, and other scheduled core samples. Alternative designs that are less dependent on surface hardness of materials are being evaluated to provide a long-term reliability improvement.
- The knife edge seal sampler insert will be deployed for the second core scheduled on TX-113. This is expected to result in improved recovery of sample material.

Partnering Team Meetings:

- The Partnering Team held a meeting on February 25, 1999. The status of deliverables toward meeting commitments in the FY 1999 WIRD were discussed. Additionally, changes in TWRS program necessary to support closure of the Tank 241-SY-101 waste level growth issue and the effect of these changes on the Characterization Project were discussed.
- The Partnering Team will meet on March 12 to discuss the Draft FY-2000 WIRD.

Issues:

- No issues to report for the month of February.

Planned Activities:

- M-44-13C: Submit Draft Waste Information Requirements Document (WIRD) to Ecology for FY 2000; Due Date 6/30/99.
- M-44-14C: Submit Final Waste Information Requirements Document (WIRD) for FY 2000 to Ecology; Due Date 8/31/99.

- M-44-15C: Issue Characterization Deliverables Consistent with Waste Information Requirements Document (WIRD) Developed for FY 1999; Due Date 9/20/99.
- M-44-16C: Complete input of Characterization data for HLW Tanks for which sampling and analysis were completed per the FY 1999 Waste Information Requirements Document (WIRD) into electronic database. Provide offsite access to the database to EPA and Ecology; Due Date 9/30/99.

M-45-00, "Complete Closure of All Single-Shell Tank Farms"

Status:

- M-45-02D: SST Retrieval Sequence
  - Will meet milestone 9/30/99
  - Current Tank Waste Remediation System Operations and Utilization Plan (TWRSOUP) under review by RL. TWRSOUP has sequencing alternative(s) to meet recent BNFL waste delivery requirements consistent with retrieval strategy of the Mission Analysis Report identifying a new risk based SST retrieval sequence for phase 2 of which Ecology was briefed on in December.
- M-45-03A: C-106 Sluicing
- M-45-09D: Leak Monitoring/Detection and Mitigation
  - Will meet milestone 9/30/99
  - Efforts underway to assess and integrate risk-based leak loss analyses utilizing uncertainty into leak detection for phase 2 sequencing. Briefed Ecology February 26, 1999 on Retrieval Performance Evaluation draft final which has developed this methodology. Meetings underway with C-102/104 project team to assess applicability of methodology to near-term tank selection criteria, phase 1. Ecology has been briefed on tank selection process Alternative Generation Studies (AGA) and have requested update briefing on tank selection and leak loss which will be accommodated.

Milestone M-46-00, "Double-Shell Tank Space Evaluation"

- Letter from RL to Ecology by February 1, 1999, stating plan for supplementary OWVP updated case run.

Milestone M-50-00, "Complete Pretreatment Processing of Hanford Tank Wastes"

Milestone M-51-00, "Complete Vitrification of Hanford High Level Tank Wastes"

Milestone M-60-00, "Complete Vitrification of Hanford Low Level Tank Wastes"

Milestone M-61-00, "Complete Pretreatment and Immobilization of Hanford Low Activity Tank Wastes"

Contract Deliverables (Through March 1999)

Item #	Contract Description	BNFL Schedule
B-1-1	**Project Management Plan**	**10/24/98**
B-1-2	**Integrated Master Plan (Part B-1)**	**11/23/98**
B-1-6	**Development Requirements Document**	**11/23/98**
B-1-9	**Engineering and Design Standards Requirement Document**	**11/23/98**
B-1-10	**Functional Specifications**	**11/23/98**
B-1-11	**Basis of Design Document**	**11/23/98**
B-1-13	**Facility Design and Operations Philosophy**	**11/23/98**
B-1-30	**Quality Assurance Provisions document**	**11/23/98**
B-1-51	**Business and Finance Schedule**	**11/23/98**
B-1-8	**Pilot Melter Basis of Design Document and Copies of Test Plans**	**12/15/98**
B-1-39	**Draft Risk Assessment Work Plan**	**12/18/98**
B-1-3	**Initial Cost Documentation Package**	**12/22/98**
B-1-20	**System Analysis and Optimization Studies**	**12/22/98**
B-1-60	**Estimate of Termination Obligations**	**12/22/98**
B-1-2	**Integrated Master Plan (updated for all of Part B)**	**12/22/98**
B-1-30	**Quality Assurance Provisions document Revision 1**	**2/22/99**
B-1-33	**Design Safety Features Document**	**2/24/99**
B-1-49	**Financing Plan (Initial Draft)**	**2/24/99**
B-1-55	**Project Facility Financial Pro-Forma (Draft)**	**2/24/99**
B-1-70	**Draft – Rev 3 Infrastructure Interface Control Documents**	**2/24/99**
B-1-35	Dangerous Waste Permit Application	3/24/99
B-1-5	Monthly Status Reports	3/31/99
B-1-38	Prevention of Significant Deterioration (PSD) Analysis	4/24/99
B-1-40	Final Risk Assessment Work Plan	4/30/99
B-1-5	Monthly Status Reports	4/24/99
B-1-50	Financing Plan – Final	5/24/99
B-1-52	Project Documents to Support Financing Draft	5/24/99
B-1-5	Monthly Status Reports	5/28/99

Note: Deliverables that are bold have been received.

Status:

- All BNFL deliverables and DOE reviews have been completed on schedule

- Pricing/re-pricing Contract negotiations underway
- Comments on 120-day deliverables provided January 22, 1999
- Decision papers on TWRS-P System Analysis and Optimization Studies are being prepared; preliminary decision made on all studies
- Presentation of key project activities to the Office of River Protection Executive Board occurred on February 8
- Pilot scale melter on schedule and operational
- 6-Month decision:
  - Draft decision criteria and plan prepared – December 1998
  - Cross-organizational team established – January 1999
  - Decision criteria finalized and approved by ORP Executive Board – February 1999
  - Decision criteria applied and results to be presented to ORP Executive Board – March 1999

Milestone M-90-00, "Complete acquisition of new facilities, modifications of existing facilities, and/or modifications of planned facilities, as necessary to conduct interim storage of immobilized High Level Waste and storage/disposal of Immobilized Low Activity Tank Waste"

Status:

- M-90-01, Submit Interim Storage and Disposal ILAW and Interim Storage IHLW PMPs to Ecology≅ (12/97)
  - Project Management Plans were completed and delivered to Ecology in December 1997.
  - Ecology and DOE have agreed to update the PMP following the rebaselining to the privatization contract.
  - Revised PMPs are scheduled for September 1999.
- M-90-05T, Submit final ILAW disposal facility Performance Assessment to Ecology for review (12/01)
  - Performance Assessment has been transmitted to DOE-HQ and Ecology (6/98).
  - Performance Assessment is undergoing review by the DOE-HQ Low-Activity Waste Federal Review Group.
  - Draft Performance Objectives for the FY 2001 Performance Assessment was provided to Ecology for review. Comments were informally dispositioned on 2/26/99 to support distribution of a revised Performance Objectives report for formal review.

- M-90-07T, Complete ILAW disposal facility conceptual design (6/00)
  - Project W-520 90% conceptual design is complete.
  - Conceptual design effort is on hold pending completion of alternative analysis.
  - Contractor recommendation is due to DOE-RL March 31 1999.
- M-90-12, Submit revised canister storage facility Part A (06/99)
  - ✓ NOI for Project W-464 prepared and submitted 1/15/99.
  - DOE-RL is currently planning to meet M-90-12.

M-20-00, Submit Part B Permit Applications

- M-20-56, Submit canister storage facility Part B (12/00)
  - On hold pending completion of IHLW alternatives analysis, TPA negotiations for TWRS privatization, and need date for permits.
- M-20-57, Submit interim ILAW facility Part B permit application to Ecology (12/2000)
  - On hold pending completion of ILAW alternatives analysis, TPA negotiations for TWRS privatization, and need date for permits.

Issues:

- Modification of Project W-465 scope from storage to disposal has not been resolved.
- DOE will be requesting sealed source determination for IHLW canisters and ILAW containers from DOH.
- Revisions to the privatization contract have changed the need dates for Projects W-464, W-465, and W-520; dates are no longer consistent with TPA M-90 and M-20 milestone dates.

Planned Activities:

- Complete ILAW and IHLW alternatives analyses with contractor recommendations for Projects W-464, W-465, and W-520 due to DOE in March 1999.
- Submit M-90 and M-20 Change Request for W-465 scope change to Ecology for consideration (depending on recommended alternatives).
- Rebaseline ILAW and IHLW plans in Multi-Year Program Plan.
- Update ILAW and IHLW Project Plans and submit to Ecology.

Clean Air Act

- Non-radioactive air emissions notice of construction for using a portable exhauster for saltwell pumping of single-shell tanks was approved by WDOE, October 1998.
- Radioactive notice of construction for saltwell pumping of single-shell tanks was approved by WDOH, December 1998.
- C-106 sluicing efforts have been temporarily halted due to exceeding the VOC limits in the notice of construction and worker health and safety issues. Efforts to resolve all issues are in progress.

DST Part B Permitting

- Ecology needs to identify a point-of-contact for TWRS RCRA permit applications.
- Double-Shell Tank RCRA Part B Permit Application.
  - Discussions are needed with the new Ecology TWRS Program and Permitting representatives regarding revision of the Part B permit schedule in response to the one-year extension granted by Ecology.
  - Eight chapters completed (Chapters 1, 5, 7, 8, 9, 10, 12, and 13).
  - Two chapters (6 and 11) and the recent revision to the DST Waste Analysis Plan (WAP) are with Ecology for review.
  - Five chapters are outstanding (Chapters 2, 3, 4, 14, and 15).

Final Safety Analysis Report (FSAR)

- Final FSAR is ~~currently under Tier II review by TWRS~~ through Tier III ORP
- Approval authority was delegated from DOE-HQ to RL
- Approval planned in FY 1998
- Transition from TWRS BIO to FSAR will commence in FY 1999.

Vadose Zone

Status:

- The M-45-98-03 TPA change package began public comment on February 15, 1999 for a period of 45 days and will conclude on April 1, 1999.
- M-45-51 - Internal planning for the Phase I RFI/CMS Work Plan for Single-Shell Tank (SST) Waste Management Areas (WMA) is well underway. The planning workshop with Ecology was tentatively

set to begin on March 9 but due to the extension of the S-SX WMA planning the workshop will begin on March 16.

- M-45-52-T01 - The data quality objectives workshop with Ecology for the Preliminary site-specific SST WMA Phase I RFI/CMS work plan for WMA S-SX began on February 16 and is set to conclude on March 11. Included in the planning for new field characterization efforts to commence this summer are the decommissioning of borehole 41-09-39 and vadose zone sampling from planned RCRA groundwater assessment wells .
- M-45-56-T01 - A subcontract is being put in place to accomplish the scope laid out for the engineering study on additional interim measures.
- M-45-57 - Replacing the leak-tight caps on all drywells within the SST farms is on schedule to be completed by June 1999.

M-45-59-T01 The TechCon Forum for reducing surface infiltration within the SST farms is scheduled for May 4, 5 and 6 in Richland.

Public Involvement

- Health Safety and Waste Management Committee
  - April 14, 1999, Richland
  - May 12, 1999, Richland
- Hanford Advisory Board
  - March 25-26, 1999, Richland
- Privatization Public Forum
  - March 24, 1999, Richland.

March 1999

TWRS - Disposal Project Phone List

Name:	Job Duties	Phone Nr.:	Email Address:
Dahl, Suzanne	Project Manager	736-5705	SDAh461@ecy.wa.gov
Delistraty, Damon	Risk Assessment for BNFL Permit	360-456-6362	DDEL461@ecy.wa.gov
Dorsey, Donavon	SEPA	736-3032	DDOR461@ecy.wa.gov
Dougherty, Dave	Tank Waste Characterization	736-3047	DDOU461@ecy.wa.gov
Elsethegan, Kelly	BNFL Permit Writer/IPT Regulator/LDR/Delisting	736-5718	KELS461@ecy.wa.gov
Goswami, Dib	Glass Storage/Disposal Performance Issues	736-3015	DGOS461@ecy.wa.gov
Grantham, John	BNFL Contract/Vitification Treatment/IPT	360-407-7140	RJUL461@ecy.wa.gov
Heggen, Dick	W314/W211/W151/Tankfarm Upgrades/Cross Site Transfer	736-5716	DHEG461@ecy.wa.gov
Hensley, Jerry	Air Permitting/NOCs & BNFL Eng. Support	736-3017	JHEN461@ecy.wa.gov
Holland, Dave	C106 Retrieval Project / SST Resequenciny	736-3027	DHOL461@ecy.wa.gov
Julian, Robert	Glass Storage & Disposal Issues	736-5702	RJUL461@ecy.wa.gov
Leja, Stan	Vadose Zone/Groundwater/SST Corrective Action/RFI	736-3046	SLEJ461@ecy.wa.gov
Maine-Jackson, Zelma	Vadose Zone Corrective Action/SXDQO/Field Work	736-3024	ZJAC461@ecy.wa.gov
McKinney, Scott	SST Closure/Retrieval/Waste Feed/Leak Detection	360-407-7146	SMCK461@ecy.wa.gov
McManus, Elizabeth	BNFL Permit Coord./IPT Regulator/LDR/Delisting	360-407-6524	EMCM461@ecy.wa.gov
Skurla, Steve	STCG-Tank Focus/Tank initiative/Leak Monitoring & Migration	736-3011	SSKU461@ecy.wa.gov
Tallent, Geoff	NEPA	360-407-7112	GTAL461@ecy.wa.gov
Wooley, Ted	Privatization/Tech Review/IPT Interface	736-3012	TWOO461@ecy.wa.gov
Yokel, Jerry	Chem. support/Risk Assessment BFNL Permit	736-3009	JYOK461@ecy.wa.gov

DRAFT

Change Number	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date
M-32-99-02		March 18, 1999

Originator

H. M. Rodriguez

Phone

(509) 376-6421

Class of Change

[ ] I - Signatories [X] II – Executive Manager [ ] III - Project Manager

Change Title

Delete Hanford Federal Facility Compliance Agreement and Consent Order (TPA) interim milestone M-32-06 and target date M-32-06-T01.

Description/Justification of Change

The 244-AR Vault consists of a two-level, multi-cell, reinforced concrete structure that houses two 43,000-gallon tanks (TK-001 and TK-002) and two 4785-gallon tanks (TK-003 and TK-004). No waste transfers to the 244-AR Vault have been made since 1978 (estimated). Current status is to continue monitoring the existing waste levels in the tanks and sumps, remove sump liquids as soon as operationally feasible, and begin deactivation planning. As there are no future missions planned for this vault, the 244-AR Vault and associated tanks have been transferred to the dangerous waste Single-Shell Tank (SST) Part A Permit, Form 3.

During initial negotiations on TPA Milestone M-32-00, it was determined that Single Shell Tank (SST) units would require separate negotiations/milestones. Therefore, the scope of TPA Milestone M-32-00 excluded SST units. Now under the SST Part A Permit; the 244-AR Vault will be addressed by TPA Milestone M-45-00. TPA Milestone M-45-00 addresses complete closure of all SST farms without mandating upgrades to achieve compliance with RCRA interim status tank system requirements. No wording changes, due to this transfer, need be made to Milestone M-45-00.

(continued on page 2)

Impact of Change

This change will align the 244-AR Vault with its correct TPA M-45-00 milestones for Complete Closure of all Single Shell Tank Farms

Affected Documents

Hanford Federal Facility Agreement and Consent Order Action Plan, Appendix D, as amended.

Approvals

_____ _____ _____Approved_____Disapproved
DOE Date

_____ _____ _____Approved_____Disapproved
EPA Date

_____ _____ _____ Approved_____Disapproved
Ecology Date

Description/Justification of Change (cont'd)

Modify TPA interim milestone M-32-06 and target date M-32-06-T01 as follows:

M-32-06	Complete 244-AR Vault Interim Status Tank Actions.	Delete
M-32-06-T01	Complete and submit integrity assessment report and identified upgrades for 244-AR Vault interim status tank system (except that DST transfer lines that penetrate the 244-AR Vault will continue to be used). Provide a schedule to address any deficiencies described in the report related to tank system compliance.	Delete

DRAFT

Change Number	Federal Facility Agreement and Consent Order Change Control Form	Date
M-32-99-01	Do not use blue ink. Type or print using black ink.	March 18, 1999

Originator | **Phone**

Hector Rodriguez | (509) 376-6421

Class of Change

[ ] I - Signatories [X] II - Executive Manager [ ] III - Project Manager

Change Title

Delete Hanford Federal Facility Compliance Agreement and Consent Order (TPA) interim milestone M-32-08 and target date M-32-08-T01.

Description/Justification of Change

During negotiations on TPA interim milestone M-32-08, it was recognized that the Grout Facility, while in a standby condition, had the capacity to restart. Therefore, interim milestone M-32-08 was written to require the completion of an integrity assessment of the Grout tank system "prior to processing DST waste." As the Grout Facility will not process DST waste, the interim milestone and target date are no longer needed.

Modify TPA interim milestone M-32-08 and target date M-32-08-T01 as follows:

M-32-08	Complete Grout Interim Status Tank Actions	Delete
M-32-08-T01	Complete and submit integrity assessment report for Grout interim status tank system. Complete activities required to correct any deficiencies described in the report related to tank system compliance.	Delete

Impact of Change

Approval of this change control form will delete interim milestone M-32-08 and target date M-32-08-T01. No other milestones are affected.

Affected Documents

Hanford Federal Facility Agreement and Consent Order Action Plan, Appendix D, as amended.

Approvals

_____ _____ _____Approved_____Disapproved
DOE Date

_____ _____ _____Approved_____Disapproved
EPA Date

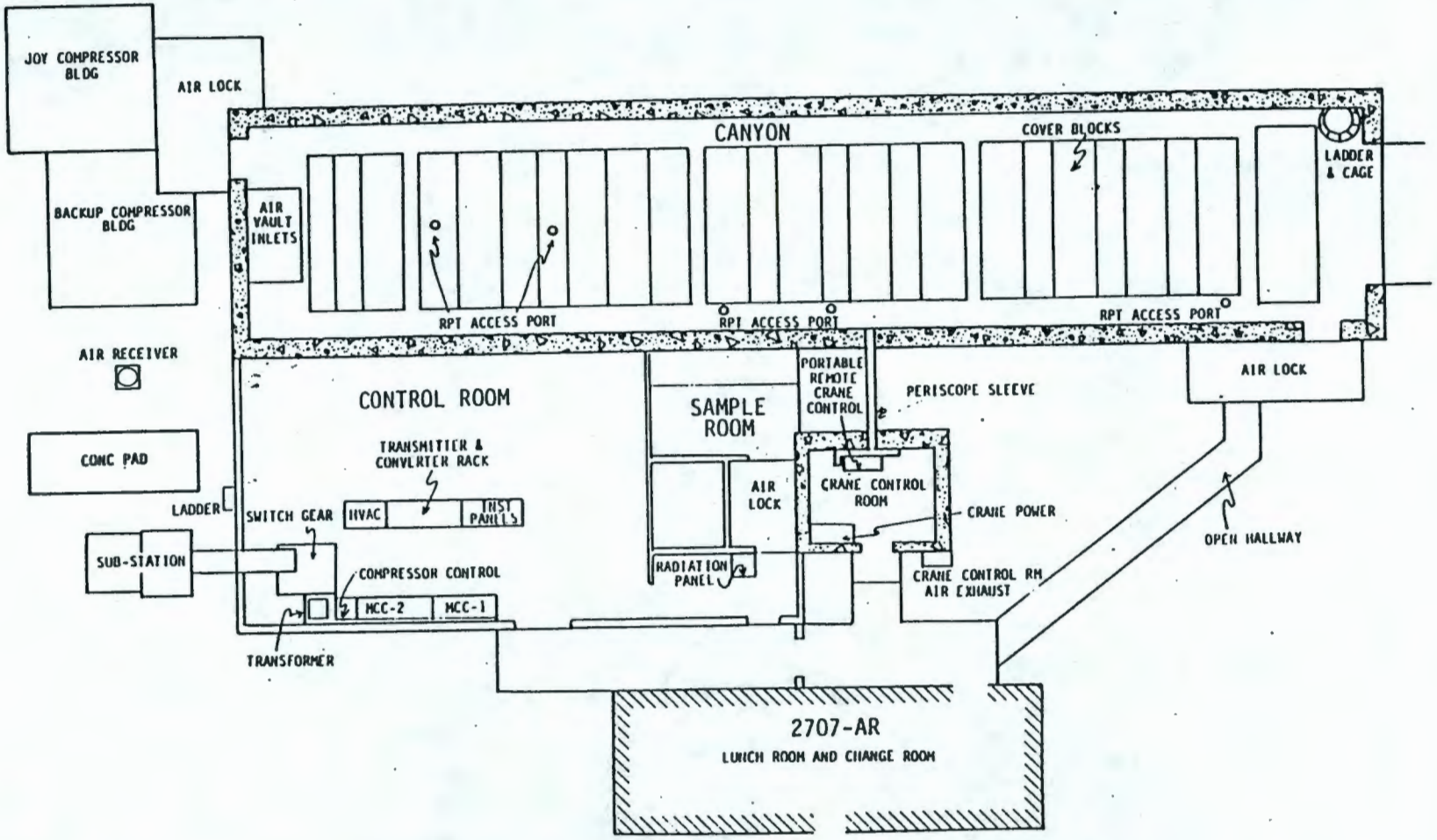
_____ _____ _____ Approved_____Disapproved
Ecology Date

244-AR VAULT

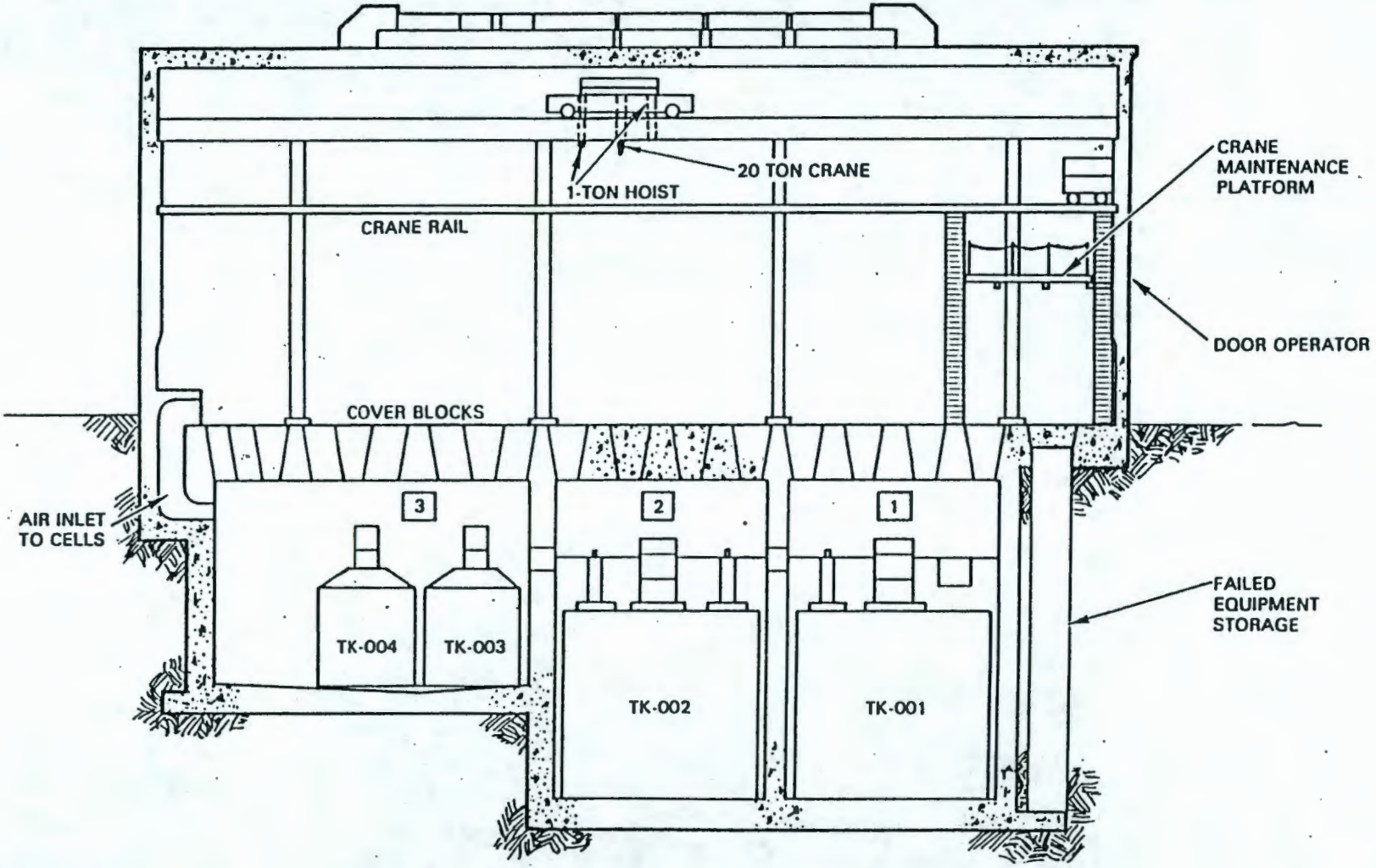
March 18, 1999

- **CONSTRUCTED IN MID 1960'S**
- **USED TO SUPPORT STRONTIUM AND CESIUM RECOVERY EFFORT FROM PUREX WASTE AT B-PLANT**
- **INACTIVE – LAST TRANSFER MADE IN 1978 (estimated)**
- **244-AR VAULT TRANSFERRED TO SST PART A IN 9/96.**

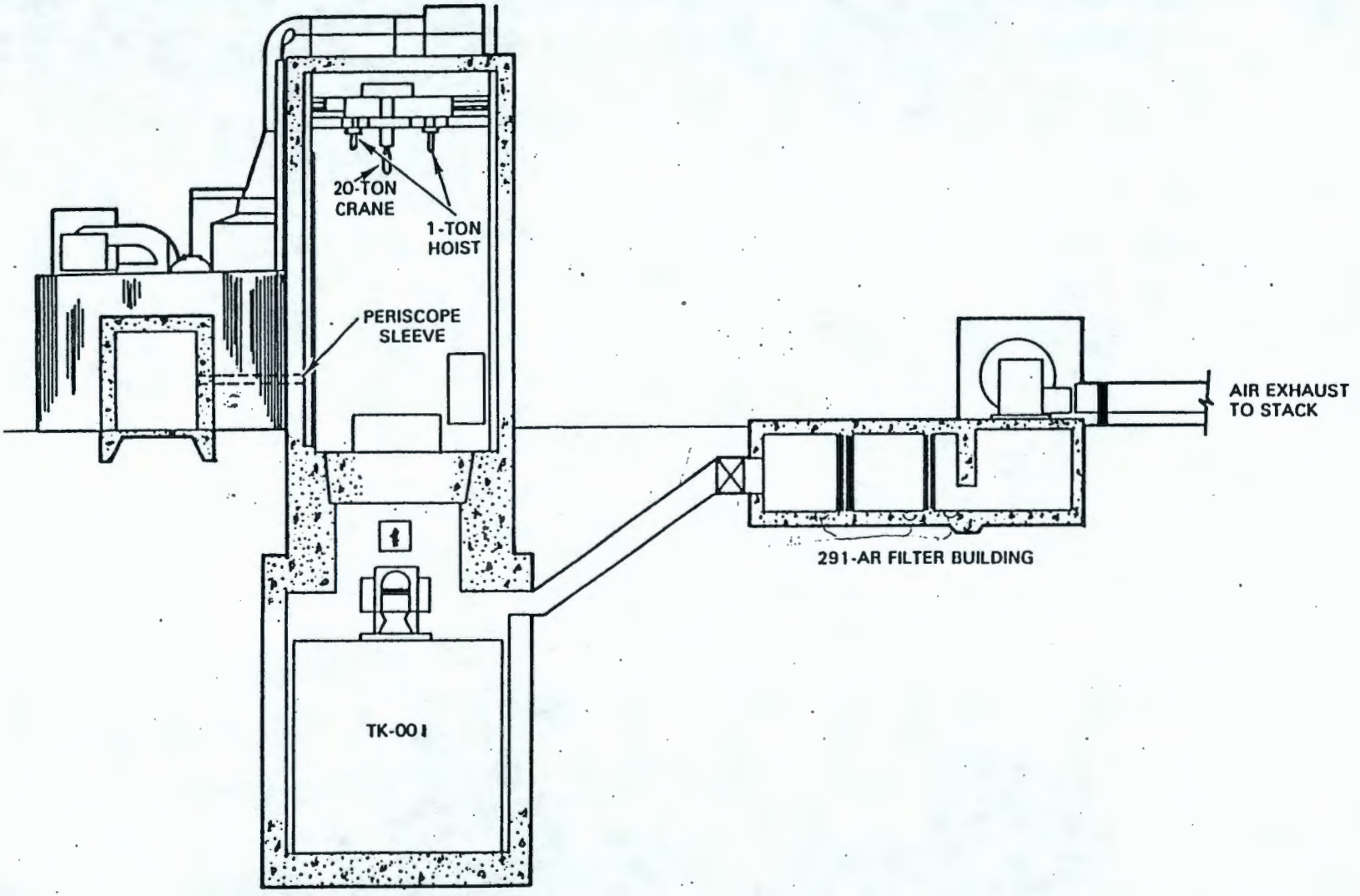
244-AR


JOY COMPRESSOR BLDG
AIR LOCK
BACKUP COMPRESSOR BLDG
AIR VAULT INLETS
CANYON
COVER BLOCKS
LADDER & CAGE
RPT ACCESS PORT
RPT ACCESS PORT
RPT ACCESS PORT
AIR RECEIVER
CONTROL ROOM
SAMPLE ROOM
PORTABLE REMOTE CRANE CONTROL
PERISCOPE SLEEVE
AIR LOCK
CONC PAD
TRANSMITTER & CONVERTER RACK
LADDER
SWITCH GEAR
HVAC
INST PANELS
AIR LOCK
CRANE CONTROL ROOM
CRANE POWER
OPEN HALLWAY
SUB-STATION
COMPRESSOR CONTROL
RADIATION PANEL
CRANE CONTROL RM AIR EXHAUST
MCC-2
MCC-1
TRANSFORMER
2707-AR
LUNCH ROOM AND CHANGE ROOM

244-AR


1-TON HOIST
20 TON CRANE
CRANE MAINTENANCE PLATFORM
CRANE RAIL
DOOR OPERATOR
COVER BLOCKS
AIR INLET TO CELLS
3
2
1
TK-004
TK-003
TK-002
TK-001
FAILED EQUIPMENT STORAGE

244-AR


20-TON
CRANE
1-TON
HOIST
PERISCOPE
SLEEVE
AIR EXHAUST
TO STACK
291-AR FILTER BUILDING
TK-001

- **VENTILATION SYSTEMS (CONTROL BUILDING, CANYON, VESSEL VENT) NOT MAINTAINED AND CANNOT BE OPERATED**

- **SUPPORT SERVICES (STEAM, SANITARY WATER, RAW WATER) ISOLATED AND CAPPED**

- **DUE TO VENTILATION/SUPPORT SYSTEMS CONDITION, NOT POSSIBLE TO JET SUMPS WITHOUT MODIFICATION TO SYSTEMS**

- **ECOLOGY AGREED TO USE OF 244-AR VAULT AS SECONDARY CONTAINMENT FOR DST TRANSFER LINES AS PART OF M-32-05 (PMM, dated 5/7/92)**

- **CURRENTLY, DST TRANSFER LINES NO LONGER USE THE VAULT AS SECONDARY CONTAINMENT**

  - **B-PLANT/PUREX LINES INACTIVE**
  - **DIVERSION BOX 241-AR-151 INACTIVE**

MEETING MINUTES
TPA DANGEROUS WASTE TANK MILESTONE
DOE-RL/WHC AND ECOLOGY
MAY 7, 1992

Attendees:	Ana R. Sherwood	Patrick Baynes	Matt La Barge
	Paul J. Krupin	Rick Millikin	R. Jay Bottenus
	Steve Killoy	Greg LeBaron	David Forehand
	Bill Bowen	M. J. Furman	Dennis Brown
	John Kovacs	Clarence V. Banks	Dale McKenney
	Lisa Garner	Ellen B. Dagan	Brad Erlandson
	Toby Michelena	James Robinson	Greg Berlin
	Tom Tebb	Gene Senat	Paula Clark

Actions:

1)	PFP	No actions
2)	Grout	No actions
3)	242-A	When an definative hot start-up date for the Evaporator is known, actual dates for the Evaporator milestones will be established. DOE-RL will provide aid in defining "Restart" for the public comment period.
4)	244-AR	DOE-RL will provide aid in defining "Restart" for the public comment period.
5)	DST	a) Ecology will review a draft of the Tank Farm milestone schedule. b) Set up meeting between parties to review annulus inspection tapes. Ecology requested a copy of the tapes. DOE-RL will status Ecology the week of May 11.
6)	PUREX	Ecology will provide proposed PUREX tank milestone language.
7)	B Plant	a) DOE-RL reevaluate the October 1994 date for completing Integrity Assessment Plan. Provide detailed schedule justifying October 1994 date. b) DOE-RL redraft language related to the acceptance of DST waste. No waste should be accepted except for WESF related wastes.
8)	T Plant	No actions
9)	219-S	DOE-RL resolve funding issues and establish firm milestone date.

10) Overall

a) DOE-RL establish schedule to resolve deficiencies revealed during integrity assessments.

b) The next Tank Milestone meeting will be held May 29, 1992, 10am in Richland.

c) Ecology requested DOE-HQ representation at a meeting tentatively scheduled for June 15, if HQ has to approve the milestone.

Concurrence:

Paul Krupin - DOE-RL

Toby Michelena - Ecology

Brad Erlandson - WHC

Discussion:

1) PFP — No discussion

2) Grout — No discussion

3) 242-A — No discussion

4) 244-AR — Ecology agreed with the continued use of the Vault as secondary containment for DST transfer lines.

5) DST — Ecology is generally concerned with the January 1994 date for completion of a final plan and schedule for completion of assessments. Ecology is also concerned that the proposed schedule for integrity assessments will not provide lessons learned for the construction of the new tank farm in a timely manner. Ecology is concerned that NDE for the entire 360 degrees of any DST is not being proposed.

6) PUREX — Ecology is strongly committed to seeing language that will limit the future operation of PUREX without additional integrity assessments and reguired upgrades. Ecology reiterated that 1-2 flushes/rinses of tank systems will not require integrity assessments, but continued use during standby/shutdown may require integrity assessments. PUREX indicated that funding to support their milestone has been reduced and may impact the completion date.

7) B Plant — Ecology is generally concerned with the October 1994 date for completion of integrity assessment plans.

8) T Plant — No discussion

9) 219-S — Ecology would like advanced notice if double walled tanks cannot be installed under the current schedule. Ecology is strongly committed to new double walled tanks and has offered their assistance to insure double walled tanks are installed.

10 Overall — Ecology anticipates a 45 day public comment period between final milestone date (tentatively June 30) and signature.

50469

Meeting Minutes
Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00

PROJECT MANAGERS MEETING
January 23, 1997

DISTRIBUTION LIST

Name	Company	MSIN	Name	Company	MSIN
K. Bandyopadhyay	Sub-TSIP	*	D. C. Pfluger	LMHC	R1-56
R. C. Bowman	WMH	H6-24	G. J. Posakony	PNNL	K5-26
S. D. Brumley	LMHC	H7-07	M. L. Ramsay	RL	S7-54
S. Bush	Sub-TSIP	*	H. M. Rodriguez	RL	A5-15
S. L. Dahl	Ecology	B5-18	F. A. Ruck	FDH	H6-23
B. G. Erlandson	LMHC	R1-51	K. V. Scott	Cogema	H3-28
A. E. Huckaby	Ecology	B5-18	A. R. Sherwood	WMH	H6-26
G.A. Leshikar	Cogema	S0-08	B. Thompson	Sub-TSIP	*
K. J. Kjarmo	E2	H8-67	A. Valero	Ecology	B5-18
P. C. Miller	LMHC	R1-51	R. W. Wilson	Ecology	B5-18
			D.A. Yaeger	FDH	B3-15

* Fax (516) 282-4255

Administrative Record: TPA Milestone M-32-00:
T-2-5, TS-2-1, T-2-7, TS-2-3, S-2-3
[Care of EDMC, LMSI (H6-08)]

Please send comments on distribution to A. R. Sherwood, H6-26, 376-6391.

MEMO

Interim Status Dangerous Waste Tank System
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00 Project Managers Meeting minutes
January 23, 1997

The following Tri-Party Agreement M-32-00 Project Managers Meeting minutes have not been signed by the Washington State Department of Ecology (Ecology). Ecology provided comments (cc:message, dated November 3, 1997) that the U.S. Department of Energy, Richland Operations Office believes are too old to accurately be assessed. Therefore, the minutes are issued without Ecology's signature.

This meeting was held on January 23, 1997 to discuss the proposed Double-Shell Tank interim milestone addition to the major M-32-00.

Attachment(s): cc:message, R. W. Wilson (Ecology) to A. R. Sherwood (WMH), "DST Meeting Minutes," dated November 3, 1997

ATTACHMENT

Author: Robert W (Bob) Wilson at ~HANFORD02A
Date: 11/3/97 3:47 PM
Priority: Normal
TO: Ana R Sherwood at ~HANFORD21A
CC: Laura J Cusack
CC: Alisa D Huckaby
Subject: DST Meeting Minutes
---------- Message Contents ----------

Ana,

Below are comments assembled from Alisa's notes and review of the January 23, 1997 DST M-32 meeting minutes. With these additions the minutes should be complete from our perspective. Other meeting minutes are too old for us to accurately assess at this point. After review of the comments below, please forward for my signature. These are items Alisa felt pertinent to the January 23rd meeting that were not reflected in the current draft meeting minutes:

A) In the introduction, Dale requested that budget limitations be considered by the sub-panel.

B) Jerry Polakony presented results of the examination of 103 AW wall and reviewed eight conclusions as a result of the examination as follows:

1- No reportable indications in primary or secondary walls.

2- Rust on tank walls presented n few problems for equipment.

3- c-scan maps were provided for each one foot coverage.

4- Remote controlled, magnetic wheel scanner was effective with scanning speed at 4.5 inches/second and scan width at 10.74 inches.

5- Water was an effective couplant.

6- Less than 5 gallons of water used to inspect 35 ft of tank wall.

7- System able to detect and characterize inclusions and welded attachments in secondary tank wall (nothing found in primary tank wall).

8- Scanning from top to bottom an advantage in cleaning tank wall.

Meeting Minutes
Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00

PROJECT MANAGERS MEETING
January 23, 1997

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Project Mangers Meeting (PMM).

W. R. Brown, Representative, Fluor Daniel Hanford, Inc. Date: 9-4-97

D. E. Jackson, Project Manager, Department of Energy, Richland Operations Office Date: 9-4-97

J. M. Thurman, Representative, Lockheed Martin Hanford Corporation Date: 9/4/97

R. W. Wilson, Unit Manager, Washington State Department of Ecology Date:

Purpose: Discuss current Double-Shell Tank Farm issues related to Milestone M-32-00.

Meeting minutes are attached. The minutes are comprised of the following:

Attachment 1 - Agenda
Attachment 2 - Summary of Discussion, Agreements and Actions
Attachment 3 - Attendance List
Attachment 4 - Status of Inspection Activities (handout)
Attachment 5 - "Results of the Performance Demonstration Tests on Double-Shell Mockup" (PNNL-11444, December 1996)
Attachment 6 - Tank Selection (handout)

MILESTONE M-32-00
PROJECT MANAGERS MEETING
January 23, 1997

Agenda

8:00 am	Introduction (D. E. Jackson, M. L. Ramsay)
8:15 am	Status of Inspection Activities (K. V. Scott)
8:30 am	Qualification of UT System/Performance Test (G. J. Posakony)
9:30 am	Tank AW-103 Data Review (G. J. Posakony)
10:30 am	Examination Plans for February 97- July 98 (K. V. Scott)
11:30 am	Lunch
1:00 pm	Tank Selection (K. V. Scott)
1:30 pm	Open Discussion - UT Methods, Extent Examination
3:30 pm	Panel Caucus
4:00 pm	Summary/Closing Statement (D. E. Jackson, M. L. Ramsay)

MILESTONE M-32-00
PROJECT MANAGERS MEETING
January 23, 1997

Summary of Discussion, Agreements and Actions

This meeting was held to discuss the Double-Shell Tank (DST) ultrasonic (UT) examination status and results with the Sub-Panel of the Tank Structural Integrity Panel (Sub-TSIP).

INTRODUCTIONS - Introductions were made around the table. Mr. Spencer Bush, of the Sub-TSIP, said that using 6 tanks to evaluate all 28 tanks is based on finding nothing wrong with the tanks. Mr. Kamal Bandyopadhyay, of the Sub-TSIP, agreed that 6 tanks are acceptable as a representative of all 28 Double-Shell Tanks (DSTs). Mr. Dale Jackson, of the U.S. Department of Energy, Richland Operations Office (RL), said that we would ultrasonically test 6 tanks and then determine the need for more examination, if any. It was also noted that it is likely that other tanks will be tested in the future in the course of conducting ongoing or recurring assessments of tank integrity. Mr. Jackson said that the purpose of today's meeting was to verify the validity of the current integrity assessment approach. He said that the issue was can we collect the right kind of information and determine the integrity and quality of the data being collected.

STATUS OF INSPECTION ACTIVITIES - Mr. Keith Scott, of SGN Eurisys Services Corp. (SESC), basically followed his handout (attachment 4). Mr. Scott said that in the event that inspection acceptance criteria is exceeded an expert panel (other than the Sub-TSIP) would be invited to convene and evaluate the significance of such data. While not in his handout, reportable criteria has been determined to be 3/16" for axial cracks, 0.25t for pits, and 0.1t for thinning. Mr. Scott explained that not requiring cleaning of the tank wall was important to the activities (saves time/money). He said that no reportable indications were found on the AW-103 tank.

QUALIFICATION OF UT SYSTEM/PERFORMANCE TEST - Mr. Gerald Posakony, of the Pacific Northwest National Laboratory (PNNL), passed out a report (attachment 5) on the "Results of the Performance Demonstration Tests on Double-Shell Mockup," (PNNL-11444, December 1996). Mr. Posakony said that the equipment performing the ultrasonic test had to be capable of remote inspection. He said that the test plates had simulated pits, wall thinning, and stress corrosion cracking (these were lab grown). Other qualifications required during the mock-up test were that all operators had to meet SNT-TC-1A-92 (a testing standard with operator certification guidelines), the test had to be performed according to the inspection procedure, and the test criteria for successful completion of the mock-up test had to be met. Mr. Posakony explained that the P-scan system used is a commonly accepted method that provides data from the plan view, front view, and end view.

The mock-up test was performed on a 1/4 section of a full scale tank. There were no welds in the test plates. Equipment skips over welds (about 1" is not covered).

Mr. Bandyopadhyay said that he had heard that this type of inspection was not successful at Savannah River. Mr. Scott said that the Savannah River examination ran 6" wide, top to bottom, in four locations with no reportables. He said that the unsuccessful tests were conducted at West Valley where the tanks are in a more humid environment and have lots of corrosion. The test equipment did have trouble operating there. Mr. Bush remembered the same as Mr. Scott. Mr. Scott said that if cracks were present, they would be expected at other locations than at the welds. The equipment inspects within ½" of a weld. Mr. Posakony said that the mock-up test did not try to apply the scanner in the weld area. Their intent was to show that the equipment worked, later they would determine its limitations. Mr. Bush said that the question will come up "did you inspect the weld area." Mr. Scott said that Hanford's tanks have been stress relieved. Weld residual stresses should be low. As it turned out, the equipment provided for the ultrasonic tests is steerable, therefore it may be able to inspect some weld area. Following more discussion on the weld area, a video of the mock-up test was shown. Mr. Posakony said that all sample defects were manufactured and that fracture mechanics were used to determine criteria. The equipment uses a T-Scan (thickness), P-Scan (angle view), and C-Scan (side and end view). ASME Section VIII guidelines were used to compute the reliability of the equipment. The mock-up test reviewed personnel, procedures, equipment, and confidence levels to national standards. The SAIC crew was not allowed to review results after their first judgement (in other words, SAIC had only one chance to interpret the UT results). The results from the mock-up test were that all 30 defects were detected with one false call. This gave a confidence level of .0.958 with a probability of detection of 0.9, that is, there is a 95.8% confidence that this system will detect 90% of the defects. The only improvement suggested by Mr. Posakony is in the detection of very thin sections.

TANK AW-103 DATA REVIEW - Mr. Posakony showed a video of the AW tank UT test. Each 10" x 35' strip took 6-8 hours to complete once equipment was deployed. The primary wall was found to be within design tolerance. The secondary tank had more indications than the primary wall; there was no pitting, but inclusions were found. The secondary tank also had some stud indications due to construction activities (weld patch, scaffolding, rebar).

EXAMINATION PLANS FOR FEBRUARY 97- JULY 98 - Mr. Scott said that in FY 97 approximately $350K has been spent to date (this does not include the cost of the contract package, awarding the contract, nor the initial planning). SAIC inspection vendor does not own the equipment. SAIC built the deployment sled. Mr. Bruce Thompson, of the Sub-TSIP, asked how we calibrate the equipment if we do not own it. Mr. Posakony said that we have a calibration procedure with test blocks incorporated into it. Procedures require a pre- and post-calibration test. Mr. Scott said that the AW tank has been in service since the mid-1980s and that no cleaning was required. When asked if other tanks will be as clean as the conditions found in the AW tank, he explained that the aging waste tanks are hotter, used since the early 1970s, and tend to rust more, but that generally the tanks

did not differ much (as seen from the visual [video] inspections performed on them earlier). Mr. Thompson suggested quantifying the wall condition to judge when a wall would be too dirty and need cleaning. He suggested looking for a distinct distortion/amplitude of results, relationship to probability of detection (compare test plates to actual test/may be done with existing data), or performing a test on a dirty wall, then cleaning it and performing a cross comparison. Mr. Scott asked for the Sub-TSIP member's opinion of the test. Mr. Thompson said it was a good job, with good data, and a good test method and analysis of test results. He said that, for him, three issues existed: wall scale (cleaning) need, ability to inspect the weld region, and the number of tanks that need to be in the sample. Mr. Bush agreed that cleaning was an issue. Mr. Posakony said that the AW tank wall condition gave us a baseline and that the next test can be evaluated against it. Mr. Scott took an action to quantify a point where wall cleaning would be necessary.

Mr. Mark Ramsay, of RL, asked Mr. Scott to price out cost to perform a SST visual of the internal surface once the tank's contents have been retrieved.

TANK SELECTION - Again, Mr. Scott followed his handout (attachment 5) in discussing the factors taken into account during the tank selection activities. The handout identifies the six DSTs that will be included in the UT examinations.

OPEN DISCUSSION - The afternoon session began with a discussion of the inspection needs for the DST bottom (air slots) and knuckle region. There are approximately 64 air slots under each tank. They are approximately 2" wide and run straight for 13' and then turn to join an adjacent slot, which in turn joins another, until 16 channels meet at the tank center. Tank AZ has metal covers over its slots. The wall thickness in the area of the knuckle varies from 7/8" to 15/16". In the region where the tank knuckle ends and the tank bottom begins is potentially a point of significant stress. Mr. Posakony mentioned that he believed that detection of a finding in these area would be possible; however determining its size would be a problem. Mr. Posakony took several suggestions for potential inspection methods.

Mr. Bush suggested inspecting a vertical weld. Mr. Thompson asked if a mock-up test would be run on weld samples if a weld was to be inspected. Mr. Posakony explained that weld inspections were not in the charter of this assessment as all DST welds were radiographed at construction.

Mr. Bush agreed with the test criteria selected for qualifying the equipment to detect wall thinning, pitting, and cracking. He stated that the knuckle was the area of concern.

Mr. Scott asked for the Sub-TSIP's recommendations as to whether inspecting the primary tank bottom (air slots) would be of benefit given the limited area available and test implementation difficulties. Mr. Bush stated that in his opinion, stress corrosion cracking was more likely to occur at the entrance to the air slots where the tank knuckle ends and the tank bottom begins. Mr. Posakony suggested using air to push the test equipment into the slot (or some other device to drive the probe into those slots without

a plate block) and a cable to pull the equipment out. He recognized that debris in the slot might hamper the equipment. Mr. Scott asked if the Sub-TSIP thought the benefits of the test justified the difficulties associated with the test. Mr. Bush mentioned that the area available for inspection was not a high percentage and may be of limited value.

Ms. Alisa Huckaby, of the Washington State Department of Ecology (Ecology), asked how much a demonstration on the knuckle would cost. Mr. Scott did not know at this time. Mr. Scott stated that he wanted to inspect all regions (wall, knuckle, bottom) as much as possible with the next tank as this will minimize the cost. He pointed out that it did no good to inspect more walls without looking at the knuckle region as it is here that failures would be the most serious. Mr. Jackson asked what happens if we can not get the knuckle region. Mr. Bush said that the Sub-TSIP was interested in the knuckle region because it could provide some advanced warning of tank failure. He said that the wall inspections give some conclusions as to the tank conditions, but that the knuckle inspections would substantially increase confidence. Mr. Scott asked if the detection mode could be used as a gate to eliminate the minor stuff we are not interested in (instead of sizing mode use only a detection mode). He suggested that we use findings of either zero or significant even if sizing is not possible above a threshold value. Mr. Bush allowed that perhaps it could. Mr. Posakony asked all to bear in mind that if the 0.2t criteria was used and found, that it was not critical, it meant that the point/area must be monitored. Mr. Bush agreed that if findings are encountered, it does not mean that the tank can not be used rather that the tank needs monitoring.

Mr. Scott asked the Sub-TSIP if the amount of tank bottom examination we are going to get in the air slot is worth the effort. Mr. Bush guessed the inspection would cover approximately 1% of the tank bottom (a fan beam might increase the inspection area, but he did not know if it was possible). He said that there was not much return for the effort, but if indications were found at the end of the knuckle, then that would increase the need for the bottom inspections. He said that even if the knuckle inspection did not include looking for pitting, major pitting would be detected. If the region showed pitting then it would suggest that some bottom inspection was needed even if only a small percentage.

SUMMARY/CLOSING STATEMENT - Mr. Scott summarized by saying that the Sub-TSIP suggested that the tank wall inspection be modified to include a vertical weld, that the knuckle region was an important area to inspect for cracks, that the primary tank bottom was an important area to inspect for pitting, and that getting the cost of all inspections will be used to evaluate the benefits of the each inspection. Mr. Bandyopadhyay agreed to write a letter summarizing the Sub-TSIP's conclusions concerning the validity of the ultrasonic data, the extent of examination, and the flaw acceptance criteria.

Attachment 3
MILESTONE M-32-00
PROJECT MANAGERS MEETING
January 23, 1997

Attendees

NAME	ORGANIZATION
Geneva Balone	U.S. Department of Energy, Richland Operations Office
Kamal Bandyopadhyay	Sub-Tank Structural Integrity Panel
W. Russ Brown (am only)	Fluor Daniel Hanford
Spencer Bush	Sub-Tank Structural Integrity Panel
Brad Erlandson (pm only)	Lockheed Martin Hanford Corp.
Norm Hepner	Washington State Department of Ecology
Alisa Huckaby	Washington State Department of Ecology
Dale Jackson	U.S. Department of Energy, Richland Operations Office
Greg Leshikar	SGN Eurisys Services Corp.
Gerald Posakony	Pacific Northwest National Laboratory
Mark Ramsay	U.S. Department of Energy, Richland Operations Office
Keith Scott	SGN Eurisys Services Corp.
Ana Sherwood	Rust Federal Services of Hanford Inc.
Bruce Thompson	Sub-Tank Structural Integrity Panel
Jack Thurman (am only)	Lockheed Martin Hanford Corp.

M-32-00 PROJECT MANAGERS MEETING

January 23, 1997

Morning

NAME	ORGANIZATION	TELEPHONE	MSIN
Lea K Sherwood	RL/ST	376-6391	H6-22
DALE JACKSON	DOE-RL	376-4851	A5-15
Alisa D. Hurtaby	Ecology	736-3034	B5-18
NORM Hepner	Ecology	736-3048	B5-18
Mark Ramsey	DOE-RL	376-7924	S7-54
Verna Bolon	DOE-RL	372-2225	A5-15
JACK THURMAN	LMHC	373-5609	R1-51
SPENCER BUSH	RS17	509-943-0033	
GERALD J. POSAKONY	PNNL	509-375-2138	K5-26
BRUCE THOMPSON	AMES LAB	515-294-9649	
Kamal Bandyopadhyay	BNL	516-344-2032	
Keith Scott	SESC	509 376-5445	H5-52
Greg Leshikar	SESL	373-4434	S2-24
RUSS BROWN	FDH-TPAI	376-4026	B2-35

M-32-00 PROJECT MANAGERS MEETING

January 23, 1997

Afternoon

NAME	ORGANIZATION	TELEPHONE	MSIN
Ana Sherwood	RUST	376-6391	H6-22
Alisa D. Huckaby	Ecology	509/736-3034	B5-18
Brad Erlandson	LMHC	372-2678	RZ-36
Greg Leshikar	SESC	373-4434	S2-24
Yvonna Chiu-Salone	DOE-RL	372-2225	A5-15
SPENCER BUSH	RSA	943-0233	
G. J. POSAKONY	PNNL	375-2138	K5-26
Mark Ramsay	DOE-RL	376-7924	S7-54
Bruce Thompson	Ames Lab	515-294-4649	
Kamal Bandyopadhyay	BNL	516-344-2032	
Keith Scott	SESC	509-373-5445	H5-52
Norm Hepner	Ecology	736-3048	B5-18
DALE JACKSON	DOE-RL	376-4857	A5-15

MILESTONE M-32-00
PROJECT MANAGERS MEETING
January 23, 1997

Status of Inspection Activities
(handout)

Status of Inspection Activities

K. V. Scott

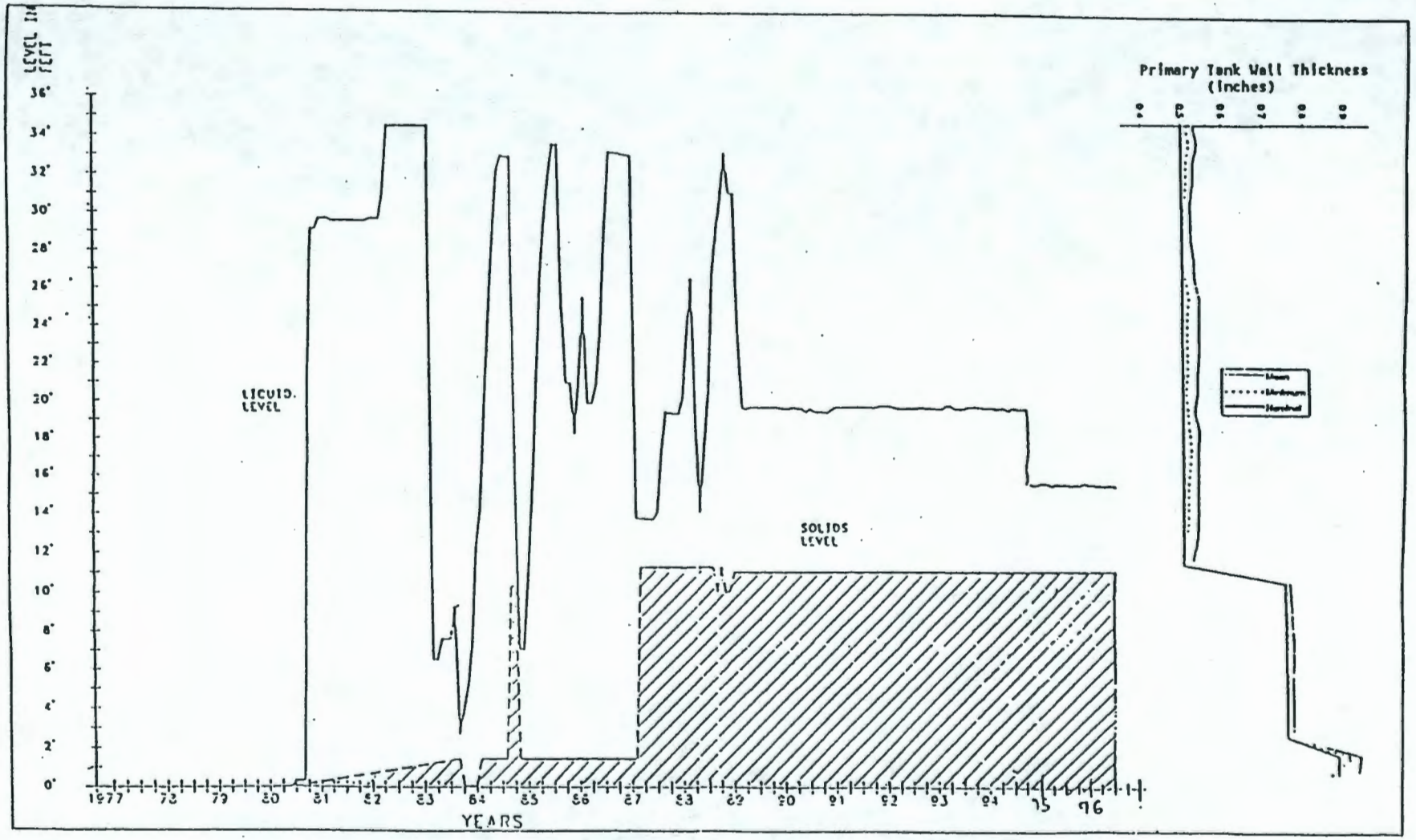
January 1997

Timeline

- Agreement to collect and review inspection data
  June 25, 1996
- Contract for wall inspection
  September 27, 1996
- System Performance Test
  November 14-21, 1996
- Tank AW-103 wall inspection
  November 22-25, 1996

AW-103 Wall Examination

- Inspection Acceptance Criteria
  - Axial cracks 3/16 inch deep
  - Pits 0.5 t
  - Thinning 0.2 t
- Vertical strips, full length of cylindrical wall
- Both primary and secondary tanks
- Two 10.25-inch wide strips on each tank
- Tank wall cleaning was not required



Comparison of As-Measured and ASTM-Specified Plate Thickness with Waste Level, DST 241-AW-103

MILESTONE M-32-00
PROJECT MANAGERS MEETING
January 23, 1997

"Results of the Performance Demonstration Tests on Double-Shell Mockup"
(PNNL-11444, December 1996)

PNNL-11444

Ultrasonic Nondestructive Examination of Double-Shell Tanks

"Results of the Performance Demonstration Tests on Double-Shell Mockup"

Report Prepared

for

K. V. Scott
SGN Eurisys Services Corporation
Richland, WA 99352

by

G. J. Posakony and T. T. Taylor
Battelle Pacific Northwest National Laboratory
Richland, WA 99352

December 1996

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Double-Shell Performance Demonstration Tests at the Mock-Up Facility in 337 Building

Executive Summary

As part of the requirements for validating the performance of the ultrasonic system proposed for the nondestructive examination of double-shell tanks at the Hanford Site, the vendor was required to complete a performance demonstration test (PDT) at the mock-up facility located in the 337 Building, 300 Area. This facility is a quarter section of a full scale tank and is designed for training and demonstrations. It simulates actual tanks that are located in the 200 Area.

Science Applications International Corporation (SAIC) was the successful bidder for the initial phase of the nondestructive examination project. They proposed using a P-Scan ultrasonic imaging system as the primary inspection instrument. The mechanical delivery system was an AWS-5 remotely controlled, maneuverable, magnetic-wheel crawler scanning system for performing the examination. Both the ultrasonic instrument and scanning system are manufactured by Force Institutes in Denmark. These systems have proven effective in detecting and sizing anomalies such as pits, wastage, corrosion and weld defects in a variety of industrial applications. This type of system has been used for inspection of waste tanks at Savannah River.

The PDT consisted of examination of a series of plates with machined defects and laboratory grown stress corrosion cracks. Initially a series of 10 plates were fabricated for the test, and PNNL measured defect sizes and locations. Five of these plates were selected for the performance demonstration. These plates were mounted in a cutout on the vertical wall of the tank mock-up. The magnetic-wheel crawler was deployed through a 24-inch riser at the top of the tank and maneuvered into position to perform the test. Video cameras mounted on the crawler and area-view cameras provided location information. The plates were scanned, results were recorded and C-Scan, B-Scan side and end views were provided to the analysis team.

The American Society for Mechanical Engineers (ASME) Section V, Article 4 was used as the basis for SAIC's ultrasonic procedure. The process used by PNNL for analyzing the PDT data and system performance was based on the approach described in ASME, Section XI, Appendix VIII. This process is designed as a screening criteria for evaluating system performance based on probability of detection (POD) and accuracy of sizing.

There were 30 machined defects and laboratory grown stress corrosion cracks in the five plates used for the PDT. SAIC detected all 30 defects and cracks but recorded one false call. Analysis of the detection performance indicates that the system has a 90% POD with 95% confidence for defects used in the PDT. The error in measuring wall thinning type defects was 0.0028" RMS (criteria +/- 0.01 inches). The error for crack depth measurement was 0.093" RMS. Based on the SOW, this is acceptable as the criteria established was +/- 0.1-inch. After analyzing the system performance in POD, false call probability (FCP) and depth sizing, the conclusion reached was that the system has the capability for reliable and accurate measurement of anomalies in Hanford's double-shell tank.

Double-Shell Performance Demonstration Tests (PDT)

On August 5, 1996, Westinghouse Hanford Company issued a Request for Proposal (RFP) WA25652-AA for the nondestructive evaluation (NDE) of double-shell waste storage tanks at the Hanford Site in Richland, WA. The successful bidder was to provide all design, materials, services, equipment, labor and documentation to safely perform the examination in accordance with specifications in the statement of work (SOW).

1.0 Highlights of Statement of Work

The aim of the nondestructive examination was to demonstrate that an ultrasonic procedure could effectively and accurately detect and size anomalies that might be present in the straight sections of the vertical walls of the double-shell tanks at Hanford. However, before proceeding with the field examination, the supplier was required to complete a performance demonstration test (PDT) at the double-shell mock-up facility at the 337 Building in the 300 Area to demonstrate that their system could meet established specifications. A system was defined as including the equipment, procedure and personnel. Specifications for the PDT included the detection and sizing of:

a. Pits	ability to size depths within +/- 0.050 inches
b. Thinning	variable thickness - ability to measure thickness within +/- 0.010 inches
c. Cracks	ability to detect and size the depth of cracks at the inner wall surface within +/- 0.10 inches
d. Location	locate anomaly within +/- 1 inch.

Westinghouse was responsible for developing and providing reference plates with known defects simulating wall thinning, pitting, and laboratory grown stress corrosion cracks that were to be used for the performance demonstration tests.

Examinations were to be performed in accordance with procedures developed from the American Society for Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section V, Article 4, "Ultrasonic Examination Methods for Inservice Inspection," 1995 edition. The supplier was responsible for developing procedures for the ultrasonic examinations of the mock-up and tanks on the Hanford Site.

The goal for the examination of the double-shell tanks was to be able to detect pits with depth exceeding 25% of the wall thickness, wall thinning that exceeds 10% of plate thickness. The nominal thickness ranges from 0.5" to 0.875". The SOW also required detection of cracks on the inside wall of the tanks that exceed 0.18 inches in depth.

Personnel participating in the examination were to be certified in accordance with the recommended guidelines of the American Society for Nondestructive Testing's SNT-TC-1A-92. Prior to the examination, the supplier was required to provide documentation describing their personnel qualification practice and document the qualifications of all personnel who would

participate in the PDT and potentially in the actual inspection of the double-shell tanks.

A copy of the Westinghouse Hanford Request for Proposal and the SAIC response is included in Appendix B. SAIC Company Practice and Personnel Qualification appear in SAIC report titled, "Ultrasonic Inspection of Double Shell Tank (DST) 241-AW-103" dated December 6, 1996, SAIC Project 01-0286-04-7357-001. This report also contains detailed information describing the results of inspection of Tank 241-AW-103.

2.0 Means for Establishing System Performance Qualification

The methodology used to develop POD, FCP and sizing performance demonstration requirements, as specified in ASME Section XI, Appendix VIII, was used for the PDT. In Appendix VIII, an inspection system is defined as including equipment, procedure and personnel used for the PDT. The evaluation of a system's performance is based on complex equations which include the number of defects in the sample base, the number of defects detected and the number of false calls reported. The procedure for screening inspection systems is not a direct measure of system capability; however, the data obtained can be used to establish the POD, sizing capability and the confidence level for the inspection. While this Appendix does not specifically address inspection of large tanks such as the double-shell tanks at Hanford, it does define a screening process for evaluating the capability of an ultrasonic system for performing such inspections.

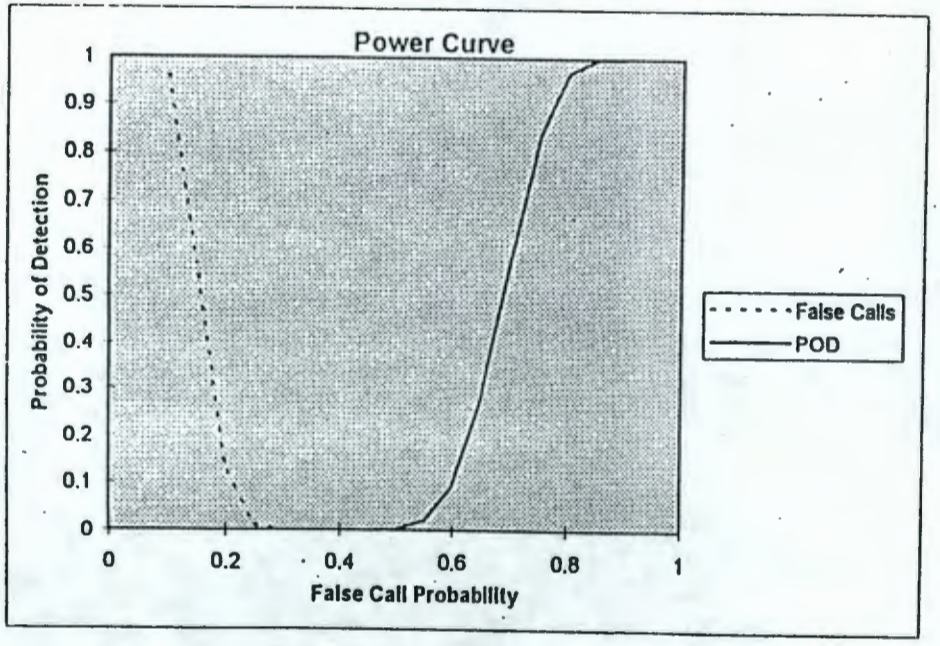
Ten plates containing mechanically simulated pits, wastage and laboratory grown stress corrosion cracks (SCC) were made available for the PDT. The size and dimensions of these flaws were established through measurements made by Pacific Northwest National Laboratory (PNNL). In defining the analysis process for the PDT, PNNL placed equal weight on detection of pits, wastage and stress corrosion cracks in the specimen plates. In accordance with the SOW, the PDT had to be successfully completed before the system could be used for inspections of the double-shell tanks.

The Section XI, Appendix VIII analysis procedure is based on statistical calculations and models that have been developed through many years of study. In the case of the double-shell tank, the number of specimens and the number of flaws in these specimens is relatively small, but it was still large enough to evaluate the performance capability of an inspection system in accordance with this section of the ASME Code. There are two separate conditions that must be met in the screening analysis for the inspection system:

- POD/False Call Probability (FCP) relationship
- capability of the inspection system to size pits, wastage and the depth of stress corrosion cracks.

An example of the analysis process for the POD/FCP relationship is described in Figure No. 1, Page 3A. The calculations are based on a 70% minimum screening guideline. To obtain the data in this figure, a grid matrix is set-up which contains 50 flaws and 100 blank grading units.

N	X	POD	PWR (POD)	S	Y	FCP	PWR(FCP)
50	35	0.1	4.8582E-24	100	15.	0.1	0.9601094
		0.15	3.0885E-18			0.15	0.5683151
		0.2	3.0338E-14			0.2	0.1285055
		0.25	2.9519E-11			0.25	0.0110833
		0.3	6.482E-09			0.3	0;000405
		0.35	4.9622E-07			0.35	6.691E-06
		0.4	1.709E-05			0.4	5.073E-08
		0.45	0.00031052			0.45	1.716E-10
		0.5	0.00330022			0.5	2.413E-13
		0.55	0.02195068			0.55	1.254E-16
		0.6	0.0955017			0.6	2.015E-20
		0.65	0.2801044			0.65	7.685E-25
		0.7	0.56917834			0.7	4.667E-30
		0.75	0.83691669			0.75	2.401E-36
		0.8	0.9691965			0.8	3.643E-44
		0.85	0.99805033			0.85	0
		0.9	0.9999826			0.9	0
		0.95	1			0.95	0
		1	1			1	0



Pro Passing= PWR(POD) x PWR(FCP)

Examples

PWR(POD)	PWR(FCP)	Pro Passing
70%	20%	7%
85%	10%	96%

Figure No. 1 Example of ASME Power Curve, Calculation and Plot for a Test Involving 50 Defects (Flaw Grading Units) and 100 Blank Grading Units

If the inspection system had a 70% POD and a 20% FCP, the probability that the system could pass the test would be only 7% (0.569 X 0.128). If the system had a POD of 85% and a 10% FCP, the probability of passing the PDT would be 96% (0.998 X 0.96). This performance is typical of what is accepted in industry. The example illustrates the discrimination capability of the power curves used in developing the criteria for the PDT. Actual PDT results are given in Section 4.0.

Summarizing the detection and sizing criteria defined in the SOW: wall thinning accuracy of +/- 0.010 inches, pit depth accuracy of +/- 0.05 inches and crack depth sizing accuracy to be within +/- 0.1 inches. Appendix VIII also describes an equation for depth sizing which is based on RMS values derived from the measured flaw depth, true flaw depth and the number of flaws measured. The PDT is designed to screen out systems which do not fulfill requirements for the inspection of the double-shelled tank.

3.0 Details of the Performance Demonstration Tests

3.1 Plates Used in the PDT

Five plates were used in the PDT. These plates were 14.5 by 21.5 inches, and all defects and stress corrosion cracks were located within an area 12 by 15 inches.

- Plate A (0.875-inch thick) — Seven round-bottom drill holes in this plate were used in the PDT. They ranged in size from 0.375 to 1.22 inches in diameter and from 0.216 to 0.583 inches in depth.
- Plate B (0.875-inch thick) — Three stress corrosion cracks in this plate were used in the PDT. They ranged in depth from 0.16 to 0.33 inches.
- Plate C (0.5-inch thick) — Eight of the round-bottom drill holes were used in the PDT. They ranged in size from 0.199 to 0.745 inches in diameter and from 0.103 to 0.375 inches in depth.
- Plate D (0.875-inch thick) — Three stress corrosion cracks in this plate were used in the PDT. They ranged in depth from 0.3 to 0.43 inches.
- Plate E (0.875-inch thick) — Nine of the simulated wastage machined cutouts were used in the PDT. The remaining wall thicknesses ranged from 0.068 to 0.630 inches.

3.2 Deployment of the Plates

A cutout the size of the plates was machined in the wall of the double-shell mockup, and a bracket was fabricated for holding the plates during the PDT. The defects in the plates were covered with a thin aluminum sheet and were not visible to the inspection team. The plates were located about six feet above the floor of the tank and about two feet to the side of the hole below the 24-inch riser. The magnetic crawler was deployed through the riser and maneuvered over the test plate. This arrangement simulated conditions that might be present in the tanks.

3.3 Performance Demonstration Tests

With the plates placed in the wall cutout, the remote magnetic-wheel crawler was deployed through the 24-inch riser in the mockup. In accordance with the SAIC procedure, the crawler was maneuvered above the test plate and the plate was scanned as the crawler moved downward across the plate. Water was used as a couplant and a water-gap technique was used to minimize the amount of water required. The zero and angle beam transducers were scanned over the plate in a 20-inch wide swath. Pixel size was 0.07 x 0.07 inches. A scan protocol from top to bottom was used to ensure wetting of the surface. Each of the five plates were scanned, and SAIC staff used A-scan and C-scan as well as side and end scans to provide their technical evaluation of each anomaly.

4.0 Results of the Performance Demonstration Tests

Hard copy interpretation and color plots of the P-Scan System data were generated by SAIC. The results are shown in Figures No. 2 and 3 on pages 5 A and B, and the calculations are shown on Page 5 C.

Figure No. 2	Power Curve (per ASME Section XI, Appendix VII) used to evaluate system performance based on the 30 defects in the test plates
Figure No. 3	Comparison between PNNL (true state) and SAIC measured value and graphs of results of pits/wall thinning and crack depth measurements
Page 5 C	Calculations for POD and confidence bound.

The system used by SAIC (P-Scan equipment, procedure and personnel) performed very well. The system POD was 90% with a 95.8% confidence bound. The error in pit/wastage sizing was 0.0028 RMS. The error in crack depth measurement was 0.0933 RMS. The crack depth measurement error, which is close to the limit defined in the specification, is the result of under sizing one of the six cracks in the test plates.

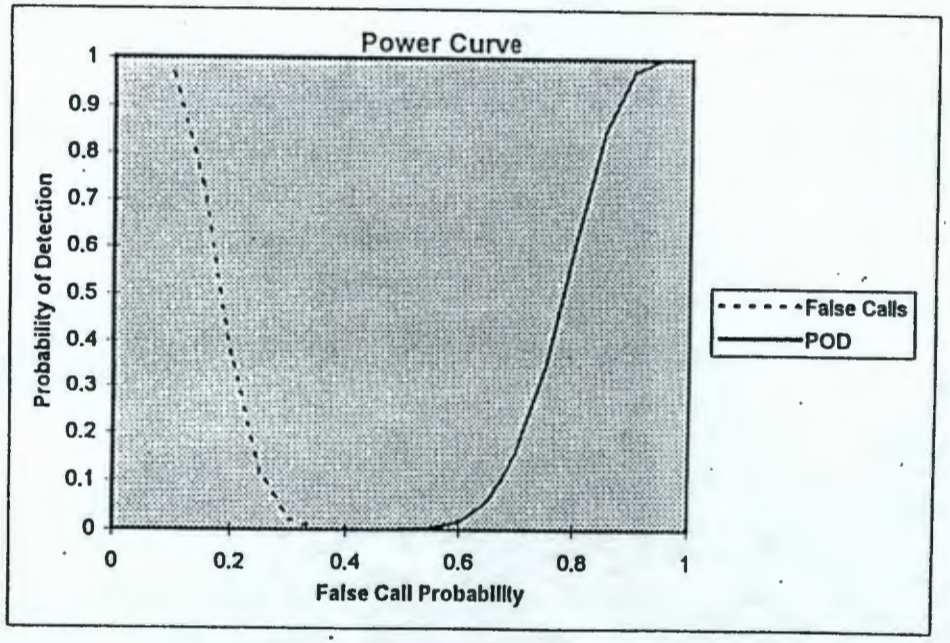
5.0 Information Provided by SAIC

SAIC provided the following results for evaluation by the PNNL team:

- Screen Height and Amplitude Linearity Tests for the Ultrasonic Equipment
- System Thickness and Sizing Calibration Test Sheets
- Thickness and sizing reports and calculated data from each of the 5 test plates

Records of data provided are given in Appendix A. These results were used in generating the data and conclusions describing the performance of the demonstration tests. Plots are provided by PNNL describing the actual location of each of the anomalies in the plates. To compare SAIC and PNNL plots, position the fiducial mark from the plate with the mark on the SAIC plots. There are two types of plots shown. The T-Scan plots are thickness plots while the P-Scan plots are 45 degree angle beam plots.

N	X	POD	PWR (POD)	S	Y	FCP	PWR(FCP)
30	24	0.1	3.2415E-19	53	9	0.1	0.9645224
		0.15	3.9351E-15			0.15	0.7340294
		0.2	2.776E-12			0.2	0.364317
		0.25	4.0751E-10			0.25	0.1143638
		0.3	2.1937E-08			0.3	0.0232894
		0.35	5.8488E-07			0.35	0.0031418
		0.4	9.2223E-06			0.4	0.0002817
		0.45	9.6223E-05			0.45	1.651E-05
		0.5	0.00071545			0.5	6.104E-07
		0.55	0.00398466			0.55	1.339E-08
		0.6	0.01718302			0.6	1.59E-10
		0.65	0.05857212			0.65	8.922E-13
		0.7	0.159523			0.7	1.924E-15
		0.75	0.34805426			0.75	1.151E-18
		0.8	0.60696989			0.8	1.101E-22
		0.85	0.84741908			0.85	5.955E-28
		0.9	0.97417331			0.9	1.756E-35
		0.95	0.99942654			0.95	0
		1	1			1	0



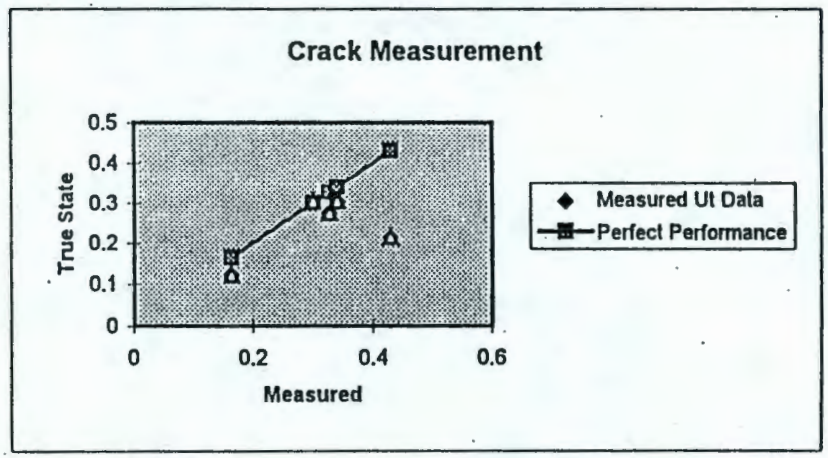
Pro Passing= PWR(POD) x PWR(FCP)

Examples

PWR(POD)	PWR(FCP)	Pro Passing
70%	20%	6%
85%	10%	82%

Figure No. 2 ASME Power Curve Developed for Performance Demonstration Tests

Wastage				Cracks			
True State	Meas. UT	Diff^2	RMS	True State	Meas. UT	Diff^2	RMS
0.345	0.331	0.000196	0.002858	0.163	0.123	0.0016	0.093352
0.224	0.211	0.000169		0.327	0.275	0.002704	
0.42	0.411	8.1E-05		0.3	0.304	0.000016	
0.345	0.331	0.000196		0.3	0.304	0.000016	
0.216	0.199	0.000289		0.34	0.304	0.001296	
0.583	0.579	0.000016		0.43	0.214	0.046656	
0.253	0.255	4E-06				0.052288	
0.125	0.13	0.000025					
0.103	0.106	9E-06					
0.152	0.17	0.000324					
0.375	0.418	0.001849					
0.353	0.274	0.006241					
0.175	0.174	0.000001					
0.204	0.206	4E-06					
0.176	0.166	1E-04					
0.058	0.148	0.0081					
0.063	0.156	0.008649					
0.068	0.168	0.01					
0.505	0.504	0.000001					
0.5	0.512	0.000144					
0.495	0.52	0.000625					
0.63	0.632	4E-06					
0.625	0.636	0.000121					
0.62	0.644	0.000576					



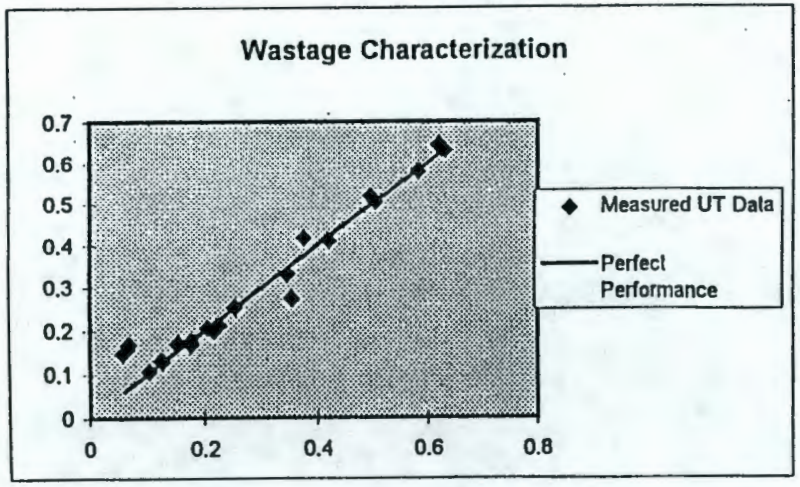


Figure No. 3 Comparison Between PNNL and SAIC Measurements and Graphs of Pit/Wastage and Crack Measurements

$n := 30 \quad x := 30 \quad s := x..n$

$P := 0.90$

$$c := 1 - \sum_{s=x}^{n} \frac{n!}{x! \cdot (n-x)!} \cdot P^x \cdot (1-P)^{n-x}$$

This simple analysis provides the lower confidence bound for POD where:

n = number of flawed grading units
x = number of flawed grading units detected
P = Probability of Detection of Ultrasonic system
c = Confidence bound

$c = 0.958$ for $P = 0.9$

$P := 0.9$

$$c1 := 1 - \sum_{s=x}^{n} \frac{n!}{x! \cdot (n-x)!} \cdot P^x \cdot (1-P)^{n-x}$$

$c1 = 0.958$

$c1 = 0.958 \qquad P = 0.9$

Calculations for POD and Confidence Bound

In practice, defects and anomalies detected by the T-Scan were also evaluated with angle beam insonification. Note that the color plots are not used for measuring wall thickness or depth of pits. Since the P-Scan system records all data and holds it in electronic memory, post analysis of the A-Scan provides the actual thickness and depth information. SAIC used B-Scan, C-Scan and end view B-Scan data to locate defects and anomalies, but used the A-Scan for interpretation of wall thinning and pit depth and used tip diffraction from angle beam inspection for estimating depth of stress corrosion cracks.

The individual data sheets provided by SAIC show that the system has a capability of measuring wastage within +/- 0.015 inches provided the remaining wall is more than 0.1 inches. The system did not accurately size simulated wastage in the test plate where the remaining wall was only 0.06 inches. Pits larger than 0.25-inch diameter and deeper than 0.1 inches were sized within +/- 0.04 inches which exceeded the specification of +/- 0.05 inches. Some smaller pits were detected, but 0.25-inch diameter was considered a minimum requirement. The system detected all cracks deeper than 20% of wall thickness and sized all but one quite accurately. This particular crack was undersized in depth but length was plotted accurately.

6.0 Conclusion

Analysis of the data shows the system has a capability of achieving a 90% probability of detection with a 95.8 % level of confidence. The results of the PDT were very good in that all machined defects and laboratory grown stress corrosion cracks were detected. Sizing was within the specification defined in the statement of work. Only one false call was recorded and, with the exception for the under sizing of one of the stress corrosion cracks, the crack sizing was well within specification. Use of this system for inspection of the double-shell tanks should provide reliable and reproducible data describing the presence and size of wastage, pits and cracks.

NOTE: Changes in equipment, procedure or personnel may require system re-qualification.

7.0 References

1. *Heasler, P. G., D. J. Bates, T. T. Taylor and S. R. Doctor, "Performance Demonstration Tests for Detecting Intergranular Stress Corrosion Cracking," NUREG/CR-4464, PNL-5705, November, 1985*

2. *1995 ASME Boiler and Pressure Vessel Code, Section XI, Appendix VIII*

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Department of Advanced Technology

Building 130

February 27, 1997

Mr. Keith V. Scott
SESC, Mail Stop H5-52
Richland, WA 99352

Subject: Review of the Ultrasonic Inspection Status of the Hanford Double-Shell Tanks

Dear Keith:

Enclosed please find a report we prepared based on the review meeting held in Richland on January 23, 1997, regarding the subject UT inspection. In summary, a Subcommittee of the Tank Structural Integrity Panel (Sub-TSIP) who attended the meeting supports the current work and recommend some refinement as further explained in the attachment.

If you have any questions, please do not hesitate to contact us.

Sincerely yours,

Kamal K. Bandyopadhyay

Kamal Bandyopadhyay

/sm

c: R. Hall
S. Bush
B. Thompson
B. Mather
M. Kassir
D. VanRooyen
J. Weeks
P. Shewmon
M. Streicher
J. Treadway

MILESTONE M-32-00
PROJECT MANAGERS MEETING
January 23, 1997

Tank Selection
(handout)

Tank Selection

- Tanks have similar design and operating controls
- Potential degradation mechanisms identified
- Degradation rates are expected to be slow
- All tanks should be in good condition
- Inspections will check expectations for
  - slow corrosion rate
  - no other degradation mechanisms
- Selected tanks biased towards those we expect to be slightly more degraded

Tank Condition Information

- Laboratory tests
- Leak detection
- Visual examination
- In-tank component examination

  SY-101 instrument tree
  AZ-101 thermocouple tree

- AW-103 ultrasonic examination
- No aggressive attack observed

Tank Selection Bias

- Factors considered
  - Years of service
  - Temperature
  - Corrosion chemistry
  - Sludge height
  - Hydrogen release
  - Number of waste transfers
  - Waste level fluctuation
  - Type of steel

Selected Tanks

	Age	Temp	Chem	Sludge	H_2	Transfer	Level	Steel
AW-103				X				
AN-107			X					
AY-101	X	X	X					X
AY-102	X	X		X		X		X
AZ-101	X	X						X
SY-101		X			X		X	X

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Meeting Minutes
Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00

PROJECT MANAGERS MEETING
March 5, 1997

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MEMO

Interim Status Dangerous Waste Tank System
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00 Project Managers Meeting minutes
March 5, 1997

The following Tri-Party Agreement M-32-00 Project Managers Meeting minutes have not been signed by the Washington State Department of Ecology (Ecology). Ecology believes that the minutes (submitted August 29, 1997) are too old to accurately be assessed. Therefore, the minutes are issued without Ecology's signature.

This meeting was held on March 5, 1997 to discuss the proposed Double-Shell Tank interim milestone addition to the major M-32-00 milestone.

Attachment(s): None

Meeting Minutes
Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00

PROJECT MANAGERS MEETING
March 5, 1997

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Project Mangers Meeting (PMM).

Not Present

_____ Date:_____
W. R. Brown, Representative, Fluor Daniel Hanford, Inc.

_____ Date: 9-29-97
D. E. Jackson, ~~Project Manager, Department~~ of Energy, Richland Operations Office

_____ Date: 9/4/97
J. M. Thurman, Representative, Lockheed Martin Hanford Corporation

_____ Date:_____
R. W. Wilson, Unit Manager, Washington State Department of Ecology

Purpose: Discuss current Double-Shell Tank Farm issues related to Milestone M-32-00.

Meeting minutes are attached. The minutes are comprised of the following:

Attachment 1 - Summary of Discussion, Agreements and Actions
Attachment 2 - Attendance List
Attachment 3 - "Review of Ultrasonic Inspection Status of Hanford Double-Shell Tanks"

MILESTONE M-32-00
PROJECT MANAGERS MEETING
March 5, 1997

Summary of Discussion, Agreements and Actions

This meeting was held to discuss the Sub-Tank Integrity Structural Panel (Sub-TSIP) report, "Review of Ultrasonic Inspection Status of Hanford Double-Shell Tanks," dated February 14, 1997. Mr. Kamal Bandyopadhyay of the Sub-TSIP participated in this meeting by phone.

Before beginning discussions on the above-mentioned ultrasonic (UT) inspection review report, Mr. Dale Jackson, of the U.S. Department of Energy, Richland Operations Office (RL) asked Ms. Laura Cusack, of the Washington State Department of Ecology (Ecology), to provide a letter for the independent, qualified, registered professional engineer (IQRPE) on the Double-Shell Tank (DST) assessment scope (six tanks). Ms. Cusack agreed to provide this letter and will send Mr. Jackson a draft of it as soon as possible.

After a brief review of the report, Ms. Cusack expressed a concern that the 20" vertical strip used during the DST UT inspections did not accommodate the TSIP's original guidelines of inspecting 5% of a tank's surface. She was concerned that various critical areas (liquid/vapor interface, sludge/liquid interface) would not be properly inspected. Mr. Bandyopadhyay stated that the Sub-TSIP had also considered this dilemma and determined that the 20" vertical strip is a reasonable approach to take. As to the specific areas Ms. Cusack mentioned, he said that the liquid/vapor and the sludge/liquid interface levels varied in the Hanford DSTs thereby lowering the residence time of these interface levels at any one location. Therefore, the TSIP's original concerns over the effects of these interface areas, which resulted in the 5% inspection guideline, diminishes. Mr. Bandyopadhyay offered to provide written justification for the Sub-TSIP's position that the 20" vertical strip is acceptable.

Mr. Bob Wilson (Ecology) asked if the 20" strip would be able to sufficiently cover the required area of a vertical weld. Mr. Keith Scott, of the SGN Eurisys Services Corporation (SESC), responded that it was possible to follow a vertical weld down the tank wall. He pointed out that the tank 30' wall plates were staggered and so were the vertical welds. Mr. Bandyopadhyay said that inspecting one weld should be sufficient to

determine if the weld has the potential for cracking. After discussing the merits vs. the lack of value of inspecting a vertical weld, Mr. Bandyopadhyay volunteered to provide Mr. Scott with some literature on the subject.

Next, the affect of scaling on the signal quality was discussed. Mr. Scott mentioned that the UT equipment vendor did not keep the A-scan image information from the AW tank inspection. He said that this type of information would be reviewed as recommended in the report during the next tank inspection.

Mr. Scott asked Mr. Bandyopadhyay to clarify how the Sub-TSIP's suggestion of inspecting a few single-shell tanks (SSTs) affects the DST assessment strategy. As there is no clear understanding as to why some SSTs have leaked, Mr. Bandyopadhyay stated that some inspection of the SSTs could put to rest any potential questions others may have about the DST assessments. He emphasized that lacking these inspections in no way casting any doubt on the DST assessment approach. He suggested that these inspections be performed "somewhere down the road." Mr. Scott acknowledged that while it was not possible for SSTs inspections to be added to the DST assessment activities, inspection of a few SSTs would someday be valuable. At this point in the meeting, Mr. Bandyopadhyay hung up and the discussion went on without him.

Ms. Cusack mentioned that with the different positions taken on certain issues getting an IQRPE on board now could minimize potential public questions on the DST assessment strategy. She acknowledged it would be sufficient if an IQRPE agreed to the DST assessment scope and that Ecology's agreement was not needed.

The topics for discussion during the next PMM, scheduled for March 10, 1997 at 3:00 pm, are the TSIP report (should Ecology need more time for review), the IQRPE's certification statement, who will perform as the IQRPE, and change control form "representative sample" wording.

MILESTONE M-32-00
PROJECT MANAGERS MEETING
March 5, 1997

Attendees

NAME	ORGANIZATION
Kamal Bandyopadhyay (by phone)	Sub-TSIP
Laura Cusack	Ecology
Dale Jackson	DOE/RL-EAP
Dan Pfluger	Lockheed Martin Hanford Corporation
Mark Ramsay	DOE/RL-WSD
Keith Scott	SGN Eurisys Services Corporation
Ana Sherwood	Rust Federal Services of Hanford Inc.
Jack Thurman	Lockheed Martin Hanford Corporation
Bob Wilson	Ecology

M-32-00 PROJECT MANAGERS MEETING

March 5, 1997

NAME	ORGANIZATION	TELEPHONE	MSIN
Jim Sherwood	RUST	376-6391	H6-22
Dave Pfluger	LMHC	376-6164	R1-56
Mark Hanson	RL	376-7924	S7-54
Carmen Cusack	Ecology	736-3038	
Bob Wilson	Ecology	736-3031	B5-18
Keith Smith	SESC	376-5445	B4-51
Jack M. Lyon	LMHC	373-5609	R1-51
DALE JACKSON	DOE-RL/EAP	376-4851	A5-15
Kamal Bandyopadhyay by phone			

Attachment 3

MILESTONE M-32-00
PROJECT MANAGERS MEETING
March 5, 1997

Review of Ultrasonic Inspection Status of Hanford Double-Shell Tanks

REVIEW OF ULTRASONIC INSPECTION STATUS OF HANFORD DOUBLE-SHELL TANKS

Kamal Bandyopadhyay, Spencer Bush, and Bruce Thompson

February 14, 1997

INTRODUCTION

A meeting was held in Richland, WA, on January 23, 1997, on the Hanford double-shell tank ultrasonic examination status. Keith Scott organized the meeting, and three members of the Tank Structural Integrity Panel (Sub-TSIP: Spencer Bush, Bruce Thompson, and Kamal Bandyopadhyay) attended the meeting (agenda and attendance list attached). This report includes a brief discussion on the inspection status and provides comments and recommendations of the Sub-TSIP.

INSPECTION STATUS

Keith Scott provided an overview of the tank ultrasonic inspection program (viewgraphs attached) and Gerald Posakony discussed the inspection procedures and results. A tank inspection supplier (SAIC) was retained to provide and use an ultrasonic inspection system (equipment, procedures and inspectors) to examine a 20-inch vertical strip of Tank 241-AW-103 primary and secondary tank watts. It was reported that the results of the inspection were that no indications of wall thinning, pits and cracks in excess of the acceptance criteria were detected on either wall. Keith Scott also described the future UT inspection plan (view graphs attached). By using a set of criteria they have selected six tanks as candidates for inspection: AW-103, AN-107, AY-101, AY-102, AZ-101 and SY-101. The inspection of AW-103 did not include the knuckle region nor the bottom. Future inspections are expected to include an examination (up to 12 ft.) of the bottom knuckle. Attempts will also be made to inspect the tank bottom by introducing transducers into the narrow vent ducts as far as practicable.

COMMENTS AND RECOMMENDATIONS

In general, the Sub-TSIP finds the demonstration of the inspection procedures and use of equipment in the examination of two vertical strips of tank AW-103 walls to follow standard acceptable methods. The sub-TSIP has some concerns regarding the conclusions drawn from the data that there was no noticeable degradation of the inspected portion of the tank walls. While this may be true, it is suggested that the data be reanalyzed in the manner discussed below in PERFORMANCE DEMONSTRATION TESTS under "Effect of Coupling Variations." This should resolve the issue of what, if any, effect the scale on the tank has on the UT data. The sub-TSIP supports the future plan to inspect the bottom knuckle region and the bottom plate as wide as possible. It recommends that the examination bracket at least one vertical weld. The Sub-TSIP also recommends that the failure mechanisms of single-shell tanks that have leaked large volumes of waste should be explored by examining a few of them. These general observations and recommendations are further described and clarified as follows:

1. Performance Demonstration Tests

The performance demonstration tests (PDTs) were quite professionally done. Particularly noteworthy was the fact that they were performed in accordance with well defined ASME procedures, which have benefited from many years of refinement and should bear considerable weight with both the public and the regulatory community. Given that this provides a very strong

foundation, there are two areas which could be strengthened by further modest effort.

Effect of Coupling Variations -- The PDTs were performed on a laboratory mock-up having a very good surface finish. When this system is applied in the field, the presence of scale and/or surface roughness may cause a degradation in signal quality. The obvious question is, "How much does this degrade the probability of detection (POD)?" Without some methodology to take this into account, the applicability of the PDT to the field tests could be questioned. Several approaches to addressing this question present themselves. One that could be applied immediately would be to utilize information in the amplitude of the back-surface signal. If the back-surface signals in field tests are lower than those in the PDT, this would imply similar changes in signals from pits and stress-corrosion cracks (SCCs). A simple way to take this into account without performing new experiments would be to perform the POD analysis again with the signals from the pits and SCCs in the laboratory plates reduced by an amount equal to the effect of the field tank surface on the back-surface signal. One could also imagine re-analyzing the field data with the threshold lowered to take into account any reduced coupling as indicated by drops in the back-surface signal. Such an approach would make the POD results of the PDT relevant. However, it might lead to an increase in false calls (FCP) above that observed in the PDT since the threshold would now be closer to the noise. A third, more expensive but stronger approach, would be to repeat PDT on samples with degraded surfaces.

Inspection of Welds -- Further attention should be given to issues associated with the detection of SCCs near welds. This should include an analysis of the SCCs observed at Savannah River, and possibly other places, with particular attention to their location (HAZ or weld material) and orientation (parallel or perpendicular to weld). For SCCs in the HAZ, it is probably the case that the current PDT is adequate. However, if one needs to examine the SCC through weld material, the effect of that material on the signal should be taken into account. A strong technical case needs to be made if weld materials are not included..

2. Extent of Examination

In general, the proposed extent of the examination is reasonable. At this point, there are several possible degradation mechanisms that have been identified. Since there is considerable uncertainty regarding which, if any, of these mechanisms is active, it makes sense to perform *as broad a set of tests as possible.*

Future ultrasonic examinations on other tanks should bracket at least one vertical weld with examination from both sides of the weld. Assuming that stress corrosion cracks, if such exist, can be either parallel to the weld or perpendicular to the weld, it will be necessary to align the transducers parallel or perpendicular to the weld to detect such flaws. This means that it will be necessary to scan the weld twice.

There should be an effort to examine at least one bottom plate, recognizing that conventional pulse echo UT will yield a very small sample of the plate, if one is limited to the area of the slots in the refractory concrete slab under the bottom plate. The best UT procedure would be one that permitted scanning of a larger region than that of a slot.

Knuckle Examination - The bottom knuckle region warrants the greatest immediate effort, both because the stresses are highest in the knuckle region and the geometry is the most difficult. As discussed at the meeting, there are two distinct issues: flaw detection and flaw sizing. Sub-TSIP concurs with the discussion held at the meeting that different approaches may be required for these two functions, and offer the following remarks that may be helpful in developing a solution.

Modes of Inspection - The problem is complicated by the fact that physical constraints cause the probe to be operated remotely from the region where stresses are highest and, hence, SCCs are most likely to occur (near the knuckle-bottom plate weld). Hence, the energy must propagate around the curve of the knuckle, reflect from the SCC, and return to the transducer resolved from other signals so that it can provide a basis for flaw detection and containing sufficient interpretable information to allow flaw sizing. The following three possible approaches may be considered:

(a) Using a high frequency probe, say 5 MHZ, such as is incorporated in the P-scan system used for the wall inspection, inject an angle beam into the upper portion of the knuckle. This will propagate the knuckle via multiple bounces. If a discontinuity is present, a signal will be reflected back to the transducer. The strength of this approach is that the sensitivity will likely be high due to the short wavelength of the 5 MHZ signals. The weakness is that the multiple bounces between the walls of the knuckles will lead to a multiplicity of returns, rendering quantitative interpretation of the data difficult. This problem is exacerbated by the curvature of the knuckle, leading to constantly changing angles of incidence and reflection and the possibility of generating mode converted signals.

(b) At the opposite extreme, one could attempt to use a single guided mode. Guided mode inspection is receiving a considerable amount of current attention in the research community, with a technical session being dedicated to this topic at the recent Review of Progress in Quantitative Nondestructive Evaluation. The proceedings will not be published until late spring or early summer, but copies of those papers can be made available to interested parties (contact R. B. Thompson). In this regime, the basic idea is to use a frequency such that the shear wavelength is greater than twice the knuckle thickness. This ensures that the propagation from transducer to SCC and back will be simple since it will only involve a single guide mode of the wall, thereby eliminating the complications associated with multiple reverberations that occur at 5 MHZ, as discussed in the previous section. For a 1-inch pipe, this frequency is approximately 50 kHz. Although such a measurement frequency appears rather low, it should be noted that a frequency of 130 kHz has been used to detect a variety of defects in buried natural gas pipelines, as discussed in one of the proceedings papers cited above. The strength of the guided mode technique is a relatively clean set of return signals, making interpretation simpler than in the high frequency measurements. The weakness is a lower sensitivity, since a defect would have to have penetrated through a significant fraction of the thickness of the knuckle wall to be detectable.

At an intermediate frequency, say 200-500 kHz, the shear wavelength will be less than the pipe wall thickness. Under such conditions, as noted by Posakony during the January 23 Review, it should be possible to excite a Rayleigh wave on the outer surface of the knuckle which will follow

its curvature and interrogate the outer portion of the knuckle bottom plate weld. Such a mode might be particularly useful for sizing, as discussed below. A possible limitation of this approach, discussed in Viktorov's book entitled Rayleigh and Lamb Waves, is the fact that (at least for a flat plate) the energy will not stay indefinitely on the surface on which the Rayleigh wave is excited. Instead, it will flip from side to side, with a period given by 2/(ks-ka). In Viktorov's analysis, he notes that, rigorously speaking, one cannot speak of a Rayleigh wave on a plate, but should analyze phenomena in terms of Lamb (plate) waves. When the wavelength is small with respect to the plate thickness, what would intuitively be called a Rayleigh wave should more rigorously be thought of as a superposition of a symmetric (So) and antisymmetric (Ao) Lamb waves on the two surfaces of the plate which are weakly coupled due to the plate's finite thickness. The transducer then excites both the So and Ao mode, phased such that the signals on the same side of the plate as the transducer add constructively while the signals on the opposite side add destructively. This may appear to be an overly complex way to describe a simple measurement, but it predicts the phenomena, mentioned above, that the energy will be periodically transferred from one side of a flat plate to the other. In the formula cited, ks is the wave vector of the So mode at the measurement frequency while ka is that of the Ao mode. As frequency increases, ka and ks asymptotically approach one another and the distance for energy transfer becomes large and the effect is unimportant. However, this is not always the case. This effect has been experimentally confirmed for flat plates. However, the effect of plate curvature, such as exists in a knuckle, has not been quantified. It is recommended that scaled laboratory experiments be conducted to determine the extent to which such propagation phenomena come to bear in the knuckle problem.

Detection versus Sizing - Both the high frequency and guided mode (low frequency) approaches show promise for flaw detection. However, sizing may not be as simple. For the high frequency approach, the relationship between signal strength and flaw size may be quite complex. For the guided mode approach, it can be argued that the reflected signal should be proportioned to flaw area, at least for cracks transverse to the wall. Data supporting this view is included in one of the cited guided mode references. Determination of depth would require an independent relationship between length and depth, as might be obtained based on growth models. However, it should also be noted that the relationship to flaw size will be quite different for other types of defects such as pits. Significant sizing information may be provided by the intermediate frequency measurements. For example, as proposed by Posakony, measurement of the reflection coefficient for Rayleigh waves propagation on the outer surface could determine whether the crack had extended into the region interrogated by the wave. Repeating at several frequencies would bracket the maximum extent of the crack. Validating this hypothesis will require resolving some of the wave propagation questions for the intermediate frequency techniques as discussed above.

3. Acceptance Criteria

The criteria for reporting or acceptance of an indication, as presented by Keith Scott at the meeting, for the wall examinations, is consistent with the guidelines in the Tank Structural Integrity Report and appears appropriate.

4. Lessons Learned from Single-Shell Tanks

Records indicate large leakage of liquid from many single-shell tanks. It has been suspected that stress-corrosion cracking of the non-stress relieved tanks was the cause of the leakage. However, in spite of suspected leakage from about 70 tanks at Hanford, no engineering study was performed to determine the nature and cause of the damage. Therefore, it is recommended that a few single-shell tanks be examined to determine the degradation mechanisms and their relevance to the structural integrity of the remaining tanks that will be relied upon for a long period. Single-shell tank examination data may also be useful in other areas of TWRS (e.g., retrieval).

It is recognized that the scope of the current program does not include any such study and is pointed out that the demonstration of integrity of a tank through *limited inspection* (as is the current case) becomes weak when the cause of leakage from a vast number of tanks remains unexplored.

SUMMARY

It appears that very good progress is being made on developing a satisfactory double-shell tank examination. The above comments are offered as possible refinements and improvements of the solid foundation already established.

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Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
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PROJECT MANAGERS MEETING
March 10, 1997

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Milestone M-32-00 Project Managers Meeting minutes
March 10, 1997

The following Tri-Party Agreement M-32-00 Project Managers Meeting minutes have not been signed by the Washington State Department of Ecology (Ecology). Ecology disagrees with the wording of a statement made within the minutes; "...(even through the Project will incur additional cost if another IQRPE is selected)." Ecology wished to specify that it was the belief of the U.S. Department of Energy, Richland Operations Office (RL) that there would be additional cost incurred. RL maintains that Ecology did not state their objection during the meeting and therefore, it should not be reflected in the minutes. Therefore, the minutes are issued without Ecology's signature.

This meeting was held on March 10, 1997 to discuss the proposed Double-Shell Tank interim milestone addition to the major M-32-00 milestone.

Attachment(s): None

Meeting Minutes
Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00

PROJECT MANAGERS MEETING
March 10, 1997

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Project Mangers Meeting (PMM).

W. R. Brown, Representative, Fluor Daniel Hanford, Inc. Date: 9-4-97

D. E. Jackson, Project Manager, Department of Energy, Richland Operations Office Date: 9-29-97

J. M. Thurman, Representative, Lockheed Martin Hanford Corporation Date: 9/4/97

R. W. Wilson, Unit Manager, Washington State Department of Ecology Date: _____

Purpose: Discuss current Double-Shell Tank Farm issues related to Milestone M-32-00.

Meeting minutes are attached. The minutes are comprised of the following:

Attachment 1 - Summary of Discussion, Agreements and Actions
Attachment 2 - Attendance List
Attachment 3 - DRAFT Letter, "Certification Requirements for Integrity Assessments of the Double-Shell Tank System"
Attachment 4 - WAC 173-303-810(13)(a) Proposed Modifications

MILESTONE M-32-00
PROJECT MANAGERS MEETING
March 10, 1997

Summary of Discussion, Agreements and Actions

This meeting was held to continue discussions on change control form M-32-96-02, which proposes new Hanford Federal Facility Agreement and Consent Order double-shell tank (DST) system integrity assessment interim milestones and target dates. Specifically, the issues of who will function as the independent, qualified, registered professional engineer (IQRPE) and what the IQRPE's certification means were discussed.

Mr. Dale Jackson, of the U.S. Department of Energy, Richland Operations Office (RL) informed Ms. Laura Cusack, of the Washington State Department of Ecology (Ecology) that he would attempt to speak with Dr. Richard Belsey of the Hanford Advisory Board (HAB), Health Safety and Waste Management Subcommittee to determine if the HAB Subcommittee would be interested in providing guidance on the issue of whether or not utilizing Mr. Keith Scott, of the SGN Eurisys Services Corporation, as an IQRPE would give the impression of impropriety, and hence justify selecting another IQRPE (even though the Project will incur additional cost if another IQRPE is selected). Ms. Cusack stated that Ecology had already initiated similar action, and that Mr. Tom Tebb (Ecology) was trying to get on the HAB Subcommittee agenda for Wednesday (March 12, 1997).

Ms. Cusack gave Mr. Jackson a draft copy of the letter (see Attachment 1) Ecology is willing to provide to an IQRPE explicitly stating Ecology's acceptance of assessing all 28 Double-Shell Tanks (DSTs) based on an assessment of data from initial ultrasonic testing of six tanks. Upon a brief review, Mr. Jackson indicated that he had concerns with some of the wording in the letter. Further discussions were differed until a later time.

Ecology's proposed IQRPE certification statement was discussed next (see Attachment 2). Mr. Jackson asked for the meaning of the additions made to the first sentence ("...I have been cognizant of the scope of work performed and major decisions made in the integrity assessments of the tank system described in this report..."). Ms. Cusack explained that this change meant that the IQRPE is cognizant of the assessment approach taken and that the approach is adequate. Mr. Jackson cautioned against using the word "cognizant" as that word is an engineering term of art, and could lead to an interpretation that the IQRPE is specifically responsible for directing and supervising the assessment work performed. Ms. Cusack agreed that this was not Ecology's intent. Mr. Jackson suggested replacing "cognizant" with "aware."

Next the addition of "...and conclusions reached are..." was discussed. Ms. Cusack stated that these words were added so that the IQRPE would certify that the tank system was fit for use. Mr. Jackson expressed his concern that certifying a thought process/conclusion may not be possible. Ecology maintained that the IQRPE is agreeing to conclusions as to the current condition of the tanks.

Mr. Jackson asked if Ecology would agree to using the Washington Administrative Code (WAC) Dangerous Waste Chapter 173-303-810(13) certification statement. Ms. Cusack said that Ecology couldn't disagree but that there would have to be agreement as to what the statement meant. Ecology would still want the certification statement to mean that the IQRPE certified the tank system as fit for use. Mr. Jackson stated that the regulations say that the owner/operator makes the fit for use determination, that the IQRPE's certification is a truthfulness certification, and that Ecology's proposed alternative certification statement goes beyond that required by the WAC. He explained that the integrity assessment report serves as a basis for the owner/operator determination that a tank system is fit for use and that the certification means that the report contains the information (in a true, accurate and complete fashion) needed to make that decision.Ecology did not accept this interpretation.

Mr. Jackson emphasized that RL's concerns with the choice of certification statement language are based in part, on an inability to predict whether or not an IQRPE with appropriate radioactive waste tank experience can be located and retained, and who will certify a tank is "fit for use." It is believed that such a certification creates a very high level of contingent liability for the certifying individual, and will be found unacceptable by virtually all engineers who are both legally and professionally qualified to provide it.

Mr. Jackson also noted that Ecology's required approach is frustrated by the fact that over half of the integrity assessment work that will be certified, has already been performed. He pointed out that the State's professional engineering licensing board has published specific regulations on the use of certification statements and affixing a professional engineer's stamp to documents, that could conflict with the certification language and stamping practices that Ecology proposes in this matter. Mr. Jackson stated that much of the work has already been performed, and consequently, a new engineer will be unable to direct and supervise all work. Consequently, that new engineer may be precluded from affixing his, or her stamp to the certification documentation. Ms. Cusack mentioned that the State licensing board was undecided as to the relationship between it practices and those required of a registered professional engineer by the WAC. It was agreed to shelve the issue until the next Project Managers Meeting so that Ecology could investigate practices throughout the state on this matter.

MILESTONE M-32-00
PROJECT MANAGERS MEETING
March 10, 1997

Attendees

NAME	ORGANIZATION
Russ Brown	Fluor Daniel Hanford - TPA Integration
Laura Cusack	Ecology
Brad Erlandson	Lockheed Martin Hanford Corporation
Dale Jackson	DOE/RL-EAP
Dan Pfluger	Lockheed Martin Hanford Corporation
Keith Scott	SGN Eurisys Services Corporation
Ana Sherwood	Rust Federal Services of Hanford Inc.
Jack Thurman	Lockheed Martin Hanford Corporation
Bob Wilson	Ecology

M-32-00 PROJECT MANAGERS MEETING

March 10, 1997

NAME	ORGANIZATION	TELEPHONE	MSIN
Neal Sherwood	Rust	376-6391	H6-22
Ross Brown	FDH-TPAI	376-4026	B2-35
Lauren Cusack	Ecology	736-3038	
Brad Erlandson	LMHC	372-2678	R2-36
Dan Pfluger	LMHC	376-6164	R1-56
JACK THORMAN	LMHC	373-5609	R1-51
Keith Scott	SESC	376-5445	B4-51
Bob Gilson	Ecology	736-3031	N3-18
DALE JACKSON	DOE-RL/ERP	376-4851	N5-15

Attachment 3

MILESTONE M-32-00
PROJECT MANAGERS MEETING
March 10, 1997

DRAFT Letter
"Certification Requirements for Integrity
Assessments of the Double-Shell Tank System"

March 10, 1997

Name
Company
Street
City, State, Zip

Dear :

Re: Certification requirements for integrity assessments of the double-shell tank system

The purpose of this letter is to clarify the agreement between the Washington State Department of Ecology (Ecology) and U. S. Department of Energy (USDOE) as to the certification requirements for integrity assessments of the double-shell tank system. WAC 173-303-040 defines a tank system as a tank and its ancillary equipment. In addition, WAC 173-303-640 requires that the integrity of dangerous waste storage tanks be assessed and certified by an independent, qualified, registered professional engineer (IQRPE). Historically this has required testing of every tank individually in addition to visual examinations and design reviews.

USDOE has proposed testing six of the 28 double-shell tanks on Hanford. The six tanks would be representative of those tanks which were subject to the most aggressive corrosive environment. It is USDOE's opinion that this approach is not allowed by the regulations.

Based on our discussions with the Tank Structural Integrity Panel (TSIP), Ecology has agreed that it could be possible to adequately asses the integrity of all 28 tanks based on a limited scope of testing. The IQRPE, however, will be certifying that all 28 tanks are fit for use. In certifying on this limited scope, therefore, the IQRPE must agree that the parameters used to select the six tanks is appropriate and that the six tanks chosen represent all the worst case conditions. If an IQRPE is willing to make this certification, Ecology will accept it as fulfilling the requirements of WAC 173-303-640.

XX

Attachment 4

MILESTONE M-32-00
PROJECT MANAGERS MEETING
March 10, 1997

WAC 173-303-810(13)(a) Proposed Modifications

WAC 173-303-810(13)(a) Modification Proposed by Ecology:

I certify under penalty of law that I have been cognizant of the scope of work performed and major decisions made in the integrity assessments of the tank system described in this report. I further certify that this document and all attachments were prepared ~~under my direction or supervision~~ in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted ~~is~~ and conclusions reached are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

WAC 173-303-810(13)(a) Unmodified:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

50472

Meeting Minutes
Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00

PROJECT MANAGERS MEETING
April 29, 1997

DISTRIBUTION LIST

Name	Company	MSIN	Name	Company	MSIN
R. C. Bowman	WMH	H6-24	H. M. Rodriguez	RL	A5-15
S. L. Dahl	Ecology	B5-18	F. A. Ruck	FDH	H6-23
B. G. Erlandson	LMHC	R1-51	K. V. Scott	Cogema	H3-28
K. J. Kjarmo	E2	H8-67	A. R. Sherwood	WMH	H6-26
P. C. Miller	LMHC	R1-51	A. Valero	Ecology	B5-18
D. C. Pfluger	LMHC	R1-56	R. W. Wilson	Ecology	B5-18
M. L. Ramsay	RL	S7-54	D.A. Yaeger	FDH	B3-15

* Fax (516) 282-4255

Administrative Record:

TPA Milestone M-32-00:
T-2-5, TS-2-1, T-2-7, TS-2-3, S-2-3
[Care of EDMC, LMSI (H6-08)]

Please send comments on distribution to A. R. Sherwood, H6-26, 376-6391.

MEMO

Interim Status Dangerous Waste Tank System
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00 Project Managers Meeting minutes
April 29, 1997

The following Tri-Party Agreement M-32-00 Project Managers Meeting minutes have not been signed by the Washington State Department of Ecology (Ecology). Ecology disagrees with a statement made within the minutes; "Ms. Cusack explained that this need did not have a regulatory driver but rather was driven from a programmatic standpoint." The U.S. Department of Energy, Richland Operations Office maintains that this statement was made. Therefore, the minutes are issued without Ecology's signature.

This meeting was held on April 29, 1997 to discuss the proposed Double-Shell Tank interim milestone addition to the major M-32-00 milestone.

Attachment(s): None

Meeting Minutes
Interim Status Dangerous Waste Tank Systems
Hanford Federal Facility Agreement and Consent Order
Milestone M-32-00

PROJECT MANAGERS MEETING
April 29, 1997

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Project Mangers Meeting (PMM).

_____ Date: 9-4-97
W. R. Brown, Representative, Fluor Daniel Hanford, Inc.

_____ Date: 9-29-97
D. E. Jackson, Project Manager, Department of Energy, Richland Operations Office

Not Present
_____ Date: _____
J. M. Thurman, Representative, Lockheed Martin Hanford Corporation

_____ Date: _____
R. W. Wilson, Unit Manager, Washington State Department of Ecology

Purpose: Discuss current Double-Shell Tank Farm issues related to Milestone M-32-00.

Meeting minutes are attached. The minutes are comprised of the following:

Attachment 1 - Summary of Discussion, Agreements and Actions
Attachment 2 - Attendance List

MILESTONE M-32-00
PROJECT MANAGERS MEETING
April 29, 1997

Summary of Discussion, Agreements and Actions

Mr. Dale Jackson, of the U.S. Department of Energy, Richland Operations Office (RL), opened the meeting by stating that RL desires to immediately address the Washington State Department of Ecology (Ecology) preference that the RL-Waste Storage Division (WSD) be assigned project management responsibility for Double-Shell Tank (DST) integrity assessment activities. Mr. Jackson announced that effective immediately, Mr. Mark Ramsay (RL-WSD) will be taking over as RL's Project Manager and lead negotiator with regard to proposed Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) DST integrity assessment interim milestones. A memorandum from Mr. John Wagner (RL) to Mr. Jackson Kinzer (RL) reflecting this change will be drafted.

Mr. Ramsay reviewed some history on the DST negotiations for the benefit of Mr. Jim McClusky (RL) who was attending these negotiations for the first time. Also, Mr. Ramsay informed Ecology that an independent, qualified, registered professional engineer (IQRPE), from the Seattle area, had reviewed the DST integrity assessment strategy. The IQRPE determined that ultrasonic (UT) testing of any of the DSTs was not necessary in order to provide an integrity assessment certification on the DSTs.

Ms. Laura Cusack (Ecology) stated that the integrity assessments were needed to meet the regulations and from a programmatic standpoint for the future use of the DSTs. She added that there is a need to determine the tanks' condition with respect to corrosion and not just to determine if they are leaking. Ms. Cusack explained that this need did not have a regulatory driver but rather was driven from a programmatic standpoint. Ms. Dahl stated Ecology's position that Ecology determines what constitutes compliance with its regulations, and that the Tri-Party Agreement should not be used to negotiate what compliance means.

Mr. McClusky suggest that the DST integrity assessment program proceed with what makes sense technically and that such a program would meet the test of regulatory compliance. Ms. Cusack mentioned that until recently, performing UT testing on 6 DSTs was considered "right' but that now the assessment would be relying mostly on leak tests. Mr. Ramsay responded by asking how much would be enough for people to be satisfied, given that the DST knuckle region and bottom inspections may not be feasible. He pointed out that the real question was not "will the DSTs last for the next 20 years" but "do we have the appropriate backup mechanisms to address a leak should one occur." Ms. Cusack emphasized that just because all the areas of interest may not be accessible, the assessment program should not eliminate performing the inspections that are

possible. She said that inspecting the knuckle region and the tank bottom would be preferred but if the inspections could not be performed, they were not important enough to also eliminate UT testing of the tank walls.

Ms. Cusack stated that if the assessment strategy was technically defensible, activities could be extended beyond the M-32-00 major milestone date of September 1999 and documented as permit conditions. She said that if the IQRPE approves the assessment strategy, then Ecology would accept the strategy. Ms. Cusack expected the IQRPE involvement to result in the confirmation that the tanks were not leaking, a description of the current condition of the tanks with respects to corrosion, cracking, etc., and, if the information gathered was not enough to evaluate all 28 DSTs, identification of additional activities needed. She was not expecting the IQRPE to state that the tanks would last for a specified number of years. Ms. Cusack emphasized that she wanted some information on the DSTs' corrosion rate/degradation. Ms. Ana Sherwood, of Rust Federal Services of Hanford, stated that neither UT tests nor corrosion rate/degradation assessments were required by the regulations. Ms. Cusack disagreed, stating that UT testing was needed as was assessing the tanks' corrosion condition and inspecting the tank bottom. Ms. Dahl said that she did not want to dispute the regulations during this meeting. If required, a compliance letter outside of the Project Managers Meeting on the interpretation of the regulations could be provided.

Ms. Cusack stated she could provide a letter stating that the regulations required that UT testing be performed and that the tanks' corrosion condition be evaluated, as Ecology considered the DSTs to be enterable tanks (as far as the annulus). Mr. Ramsay warned that it was possible that there might not be enough funds to meet Ecology's scope within the schedule they wanted and that all inspections might not be feasible. Both Ms. Cusack and Ms. Dahl allowed that the assessment schedule was open to change. Ms. Cusack added that while Ecology would certainly be satisfied with inspecting the tanks' wall, bottom, knuckle, and one tank's weld, that Ecology would accept, as a minimum, performing a 20" tank wall inspection if the IQRPE would still be able to make a corrosion assessment. Mr. Ramsay asked if the IQRPE was asked to propose an alternative method to assessing the tanks' condition, would Ecology accept his recommendation without further input and second guessing. Ms. Cusack said that she would agree, as long as the IQRPE assessed the tanks' corrosion condition and did not rely solely on leak tests. She said that if the IQRPE accepted UT testing of a 20" strip on the tanks' wall, of the tanks' knuckle region and bottom, and of a weld, then Ecology would accept the strategy. Even if the knuckle and bottom inspections were eliminated due to difficulties in performing the inspections, Ecology would accept the assessment strategy. However, she explained, Ecology would not accept an assessment on the DSTs that was based on leak tests, even if the IQRPE would.

Mr. Jackson suggested that Ecology issue their proposed letter defining compliance with tank integrity assessment regulations by early next week, give RL and the contractors two weeks to review it, and then meet with RL again the following week.

MILESTONE M-32-00
PROJECT MANAGERS MEETING
April 29, 1997

Attendees

NAME	ORGANIZATION
Russ Brown	Fluor Daniel Hanford - TPA Integration
Laura Cusack	Ecology
Suzanne Dahl	Ecology
Dale Jackson	DOE/RL-EAP
Jim McClusky	DOE/RL-WSD
Mark Ramsay	DOE/RL-WSD
Ana Sherwood	Rust Federal Services of Hanford Inc.

M-32-00 PROJECT MANAGERS MEETING

April 29, 1997

NAME	ORGANIZATION	TELEPHONE	MSIN
AR SHERWOOD	RFSH	376-6391	H6-22
LAURA CUSACK	ECOLOGY	736-3038	
Suzanne Dahl	Ecology	736-5705	
Mark Ramsey	DOE-RL	376-7924	S7-54
Russ Brown	FDH-TPAI	376-4026	B2-35
DALE JACKSON	DOE-RL-EAP	376-4851	A5-15
Jim McCluskey	DOE-RL	372-0947	

Status/Issues/Planned Activities

March, 1999

Milestone M-41-00, "Complete Single-Shell Tank Interim Stabilization"

Status:

- Single-Shell Tanks (SSTs) 241-T-104, 241-T-110, 241-SX-104 and 241-SX-106 are being interim stabilized.
- Total gallons of liquid waste pumped, as of June 1, 1998: T-104 pumped 27,183 gallons, T-110 pumped 22,520 gallons, SX-104 pumped 76,089 and SX-106 pumped 26,946 gallons.
- Engineering and Field preparation work in progress to support Tanks S-102, S-103, and S-106 pump starts.
- DOE and the State of Washington announce Consent Decree approval on March 3, 1999.
- S-102 pump start begins today.

Planned Activities:

- March 16, 1999, initial pump start for Tank S-102 is forecast for March 18, 1999
- Charter an integrated process improvement team for the Single-Shell Tank Interim Stabilization Project
- Prepare ~~S-102,~~ S-103, and S-106 for FY99 pumping starts
- Prepare U-Farm for an initial U-Farm tank start by October 1999 start
- Determine method for retrieval of organic layer in Tank 241-C-103

Briefing to Ecology
On
Tank C-106
Waste Retrieval Sluicing System

By W. Abdul

March 18, 1999

Background

- Completed replacement of leaky Jumper
- Completed the evaluation and review of VOC components
- Completed Plan for breathing control and process test

Current Status

Tank C-106 sluicing process test was performed successfully on March 7, 1999. During the test operation for 7 hours, more than 8 in sludge was transferred, which completes the first increment of 1 ft. transfer

- Process test used the temporary State permit of VOC limit of 500 ppm
- Sluicer nozzle was controlled manually to limit waste agitation
- Collected VOC samples for analysis
- Peak VOC level was 234 ppm
- VOC level monitored Continuously
- Workers within 50 ft. of exhauster were in Supplied air
- A few steps of the test were incomplete due to safety limit of 1 ft. transfer

Path forward

- Monitor tank C-106 and Ay-102 parameters for 2 weeks
- Obtain preliminary sample analysis
- Evaluate transfer of next increment of 1 ft. waste
- Target date for the next process test is March 28, 1999, using same breathing control
  - Evaluate automatic sluice mode
  - Evaluate "Heater on" during sluicing
  - Evaluate VOC components at 250 to 350 ppm.
- Re-baseline schedule to be completed in April 1999 after completion of sample analysis

Issue

- Tank C-106 Riser 14 thermocouple Temperature is high (224 degrees)