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**Meeting Minutes Transmittal/Approval**
**Unit Managers Meeting: SST Operable Unit**
**HAPO Building, Room 319**
**Richland, Washington**

November 4, 1992

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From/
Appvl: Wendell Wrzesinski Date: 12-9-92
Wendell Wrzesinski, SST Unit Manager, DOE-RL

Appvl: Scott E. McKinney Date: 12/9/92
Scott McKinney, SST Unit Manager,
WA Department of Ecology

Appvl: not present Date:
Doug Sherwood, SST Unit Manager,
EPA Region X

Appvl: D. Pabst Date: 12/9/92
David Pabst, WHC, Contractor Representative

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

Attachment #1 - Meeting Summary/Summary of Action Items & Agreements
Attachment #2 - Agenda for Meeting
Attachment #3 - Attendance List

Handout 1 - Status of Tanks 241-SX-103 and 241-SX-105
Handout 2 - Status of Tank 241-T-101
Handout 3 - Single-Shell Tanks Interim Stabilization/Isolation
Handout 4 - Single-Shell Tank Characterization
Handout 5 - Total FY 1993 AEUs (Analytical Equivalent Units)
Handout 6 - Single-Shell Tank Retrieval Technology Development
Handout 7 - Full-Scale Demonstration of Waste Retrieval Technology
Handout 8 - Full-Scale Single-Shell Tank Farm Closure Demonstration
Handout 9 - Ferrocyanide Safety Program, Installation of Thermocouples

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# UNIT MANAGERS MEETING: SINGLE-SHELL TANKS
# MEETING SUMMARY/SUMMARY OF ACTION ITEMS AND AGREEMENTS

**November 4, 1992**

<u>Introduction</u>: **(D. Pabst, WHC).** The meeting convened at 9:05 a.m. Introductions were made and the minutes from the last Unit Manager Meeting were signed.

**<u>AI-11/4/92-1</u>. The three parties are to establish the meeting dates for conducting SST Unit Manager Meetings for the next 6 months (January through June 1993).**
**Assigned: McKinney, Sherwood, Wrzesinski Due: December 9, 1992**

<u>Tank Leak Surveillance</u>: **(D. Maupin, WHC).** One measurement at SST SX-103 exceeded its decrease criteria for surface level measurement readings, with the measuring device touching on a dry surface. Subsequent measurements at this tank do not reflect crossing a leak criteria threshold. The LOW for this tank is stable, showing no liquid level decrease. SST SX-105 interstitial liquid level is at the decrease criteria, and surface level readings are stable (touching on a solid surface). Refer to handout 1.

Dry wells and liquid observation wells (LOWs) support a "no-leak" determination. SX-105 has lateral dry wells, but they are currently inoperable. There is work in progress to repair the laterals. SX-103 does not have laterals.

LOW sampling frequency at SX-105 has been increased from quarterly to bi-weekly. WHC is using the decreased scan rates, in accordance with the agreements reached between Ecology and RL for tanks C-105 and C-106. Although non-conclusive, the liquid level appears to be decreasing in tank SX-105.

**<u>AI-11/4/92-2</u>. Provide to Ecology and EPA the last five (5) year's LOW level plots and data for tank SX-105.**
**Assigned: Bishop Due: November 20, 1992**

<u>Single-Shell Tank Interim Stabilization</u>: **(R. Raymond, WHC).** Discussed the status of SST T-101. The tank was constructed in 1943. It is on the watchlist as a fecrrocyanide tank. The FIC went out of service 12/91 and back in service 9/92. A surface level decrease was noted at that time. Plans for emergency pumping this tank were discussed. It is anticipated that pumping will commence March 9, 1993. Refer to handout 2.

Tom Rainey, WHC, presented the planned activities for FY 1993 (refer to handout 3.) A request to addend the justification for continued operation (JCO) for the Criticality USQ, authorizing the restoration of pumping

activities in C- and BY-Farms, as well as T-101 has been submitted to DOE for review and concurrence.

Discussions on M-05-00 negotiation preparations and informal dispute resolution for the M-05-92-02 change package were deferred until 2:00 pm, later the same day.

Single-Shell Tank Characterization: **(P. Hernandez, RL).** (Handout #4)

- Copies of the "as-built" drawings for tanks B-110 and U-110 were provided to Ecology.
- The sampling truck is currently taking samples from tank T-107.
- The updated Waste Characterization Plan is in review at RL, with a scheduled review completion date of November 20, 1992.
- The sampling schedule indicates that tank C-106 will be sampled in early 1993 (estimate approximately March).
- The FY 1993 plan is to take 16 cores from 7 SSTs (all watch list tanks). The sampling capability would allow for taking all 24 cores required by the TPA, but analytical throughput limits the number to be analyzed. WHC is looking into taking additional cores from non-watch list tanks to fulfill milestone requirements. Ecology noted that their priority is to attempt to meet the M-10-07 milestones (24 cores from 12 SSTs) at the risk of missing the 216 day turnaround time required by the TPA.
- P. Clark (RL) provided copies of the FY 1993 laboratory analysis schedule. Refer to handout 5.

**AI-11/4/92-3. Ecology to provide comments to RL and WHC on the potential to exceed the sample hold time allowed by the TPA.**
**Assigned: McKinney Due: December 9, 1992**

**AI-11/4/92-4. RL to provide a list of the SSTs that have been core sampled and when the validated data was/is to be available.**
**Assigned: Hernandez/Propson Due: November 18, 1992**

**AI-11/4/92-5. RL to discuss the master plan for sampling all remaining SSTs.**
**Assigned: Propson Due: December 9, 1992**

Tank Retrieval Technology Development: **(M. Mahaffey, WHC).** The TWR baselining effort may impact the M-06-00 requirements, but any impacts are undefined at this time. Refer to handout 6.

Tank Waste Retrieval: **(W. Wrzesinski, RL).** RL has completed its review of the draft tank selection criteria plan and comments are being incorporated by WHC. It is anticipated that the plan will be delivered to Ecology in December 1992 to meet the M-07-01 milestone. It was noted that considerable resources are being dedicated and planned as though C-106 is the selected tank for initial retrieval demonstration. If any other tank is selected, programmatic impacts will occur and the existing schedule will not apply. The retrieval

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organizations at RL and WHC are coordinating closely with their characterization counterparts to assure that tank C-106 is sampled and analyzed as quickly as possible. Refer to handouts 7 and 8.

**Ferrocyanide Stabilization Program: (G. Dukelow, WHC).** WHC will recommend to RL to take six (6) single-shell tanks off the watch list. Each of these tanks have less than 1,000 gram moles of ferrocyanide (the watch list criteria). WHC asked if Ecology would be accept the plan to install new thermocouples into these tanks using up to 1,500 gallons of fresh water to sluice the equipment into place. The Ecology Unit Manager did not believe it to be a problem, but wanted to confirm this with technical personnel within his department. He did ask that all attempts be made to minimize water additions. Refer to handout 9.

Editorial note: Ecology confirmed in later telephone conversations that the initial position of adding up to 1,500 gallons of fresh water to sluice thermocouple instruments into the ferrocyanide tanks would not be impeded by Ecology.

**Adjournment**. The meeting adjourned at 1:10 p.m.

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Attachment 2

# AGENDA
## TRI-PARTY AGREEMENT
## Unit Managers Meeting

November 4, 1992, 9:00 a.m. to 1:00 p.m.
HAPO Building, Room 319
Hanford Site, Washington

| Time | Topic | Presenter DOE/Contractor |
|---|---|---|
| 9:00 | Opening Comments | Yerxa/Pabst |
| 9:10 | General Discussions | Yerxa/Pabst |
| | Sign Meeting Minutes from Last Meeting | |
| 9:30 | Tank Leak Surveillance and Response Information | Bishop/Maupin |
| | o 241-SX-103 | |
| | o 241-SX-105 | |
| 9:50 | Single-Shell Tank Interim Stabilization | Bishop/Raymond |
| | o 241-T-101 | |
| | o Planned Activity for FY 1993 | |
| | o M-05-00 Negotiation Preparation | |
| 10:20 | Change Request M-05-92-02, Informal Dispute Resolution | Bishop & McKinney |
| 11:00 | Single-Shell Tank Characterization | Hernandez/Propson |
| | o Accomplishments | |
| | o Special Topics | |
| | o Planned Activity for FY 1993 | |
| | o Issues/Concerns | |
| 11:30 | Single-Shell Tank Waste Retrieval | Nicoll/Henderson |
| 12:30 | Ferrocyanide Stabilization Program | Harwood/Dukelow |
| 1:00 | Adjourn | |

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Attachment 3

List of Attendees
TRI-PARTY AGREEMENT
Unit Managers Meeting

November 4, 1992, 9:00 a.m. to 1:00 p.m.
HAPO Building, Room 319
Hanford Site, Washington

| NAME | ORGANIZATION | TELEPHONE |
|---|---|---|
| David Pabst | WHC/TPA | 509-376-9048 |
| Janet Franco | Oregon Dept of Energy | 503-378-3187 |
| Tom Rainey | WHC/TWR | 509-373-3531 |
| Dennis Maupin | WHC/TWR | 509-373-3667 |
| Jon Yerxa | RL | 509-376-9682 |
| Norton McDuffie | WHC/WTS | 509-373-2653 |
| S. J. Lijek | SWEC-GSSC | 509-376-7829 |
| Scott McKinney | Ecology | 206-459-6725 |
| Wendell Wrzesinski | RL | 509-376-6751 |
| Rick Raymond | WHC/SST | 509-373-2785 |
| Guy Bishop | RL | 509-373-2113 |
| John Propson | WHC/CST | 509-373-1765 |
| Al Sampson | WHC/CST | 509-373-1869 |
| Paul Hernandez | RL | 509-376-2209 |
| Jim Madison | WHC/CST | 509-373-5701 |
| John Harris | WHC/TWR | 509-372-1237 |
| Paula Clark | RL | 509-376-4718 |
| Mike Mahaffey | WHC/EA | 509-376-1120 |
| Robert Cash | WHC/TWR | 509-373-3132 |
| Gary Dukelow | WHC/TWR | 509-373-4479 |
| Nick Hertelendy | WHC/TWR | 509-376-3156 |
| Geoff Barnes | WHC/TWR | 509-376-2241 |

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# STATUS OF TANKS

## 241-SX-103

## 241-SX-105

Handout 1

# 241-SX-103

- Exceeded Decrease Criteria for Surface Level
- Surface Level Device Touching On a Dry Surface and Not Reliable
- Dry Wells are Stable
- LOW Stable

# 241-SX-105

- Interstitial Liquid Level at the Decrease Criteria 0.3 Feet
- Surface Level Device on a Dry Surface
- Dry Wells are Stable
- LOW Scan Frequency Increased From Quarterly to Every Two Weeks
- Lateral Troubleshoot JCS Package in the System
- Evaluation of Slow Drywell Scan and Spectral Gamma to be done

# Tank 241-T-101

Type: Single Shell

Diameter: 75' ; Operating Height 16'

Capacity: 530,000 gallons

Bottom: Dished 1'

Ventilation: Passive Breather Filter

Constructed: 1943-44; In-service 12/44; Out of Service 1979

Surface Level: FIC; No Manual Tape

LOW: None Installed

External Dry Wells: 5 Perimeter

Laterals: None Installed

Last Photographed: 7/3/84 Surface Level 44.1" At The Time

Status: Watch List/FerroCyanide/Sound Deactivated/Partially Isolated

Contents: Non-complexed Waste

Total Waste Volume: 133,000 GALLONS

Supernate Volume: 30,000 Gallons

Drainable Interstitial Liquid: 5,000 Gallons

Tank 241-T-101 has had a stable surface level since the current baseline, 43.9", was established in August, 1982. In December, 1991 the FIC malfunctioned when the surface level was 44.2". No further readings could be taken until April, 1992 and the level of the waste was still 44.2". This indicated there had been no change in surface level since the FIC went out of service in 4 months eariler in December. The next readings taken in June of 1992 indicated a 1.6" decrease had taken place, but the FIC was still listed as "off". On September 18, 1992, Maintenance repaired the FIC, and the FIC was reported as functioning properly. The level reading was 41.6".

⇒ 7160 GAL, if a leak occurred

There is a -2.6" discrepancy in the surface level since December, 1991. Surveillance and Data Acquisition has reviewed the tank history because of the decrease in surface level. Items reviewed were the surface level history, dry well history and the in-tank photographs.

<u>SURFACE LEVEL</u>

See the attached surface level plot from 1989 to present.

## Evaporation

No study has been conducted. The surface level history indicates there is an insignificant amount of evaporation taking place.

## DRY WELLS

Previous and current dry well scans are stable. There have been no indications of a tank leak. S&DA has increased the frequency of dry well readings from quarterly to weekly. The dry wells were read last on September 24, 1992. The weekly schedule will be implemented during the week of October 5, 1992.

## IN TANK PHOTOGRAPHS

S&DA reviewed the most recent photographs taken on july 3, 1984, in 241-T-101. These photographs were taken when the surface level was 44.1". The entire surface is liquid. There are no solids showing. The FIC plummet is near the camera and appears very clean and touching on liquid. S&DA has requested that in-tank photographs be taken again in 241-T-101 as soon as possible. The operating procedure is current. A Safety Analysis will be performed by Waste Tank Safety Analysis because this is an FeCN tank.

## Recommendations

Verify the reference elevation once again to be certain there has been a 2.6" decrease.

Action: Operations

Increase the frequency of surface level monitoring.

Action: S&DA Action complete

Obtain intank photographs:

Action: Operations with a Safety Analysis required

D/W last checked on 9/24 - inc. sched from quarterly to weekly.
Taking liquid level daily.

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**BACKGROUND INFORMATION**
**ON HANFORD WASTE TANK 241-T-101**
**October 2, 1992**

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- Westinghouse has not determined whether waste tank 101-T is, or has, leaked. However, we are gathering data to explain the recorded drop in surface level over the past several months.

- 101-T is a single-shell tank with a capacity of 530-thousand gallons. It presently contains 133-thousand gallons of waste. Only 35-thousand gallons is drainable liquid. The remainder is sludge.

- 101-T was constructed in 1943-44. It was put into service in December 1944. It was taken out of service in 1979. The tank is 75-feet in diameter and 16-feet in height.

- T-Farm consists of 12 single shell tanks of approximately 500-thousand gallons capacity and four of 55-thousand gallons capacity. It is located in the 200-West Area of Hanford, on the north side of the intersection of Camden Avenue and 23rd Street.

- 101-T is a ferrocyanide watch list tank. Safety analyses are underway to determine operational procedures should it be determined that the tank has leaked.

- Surface level measurements indicate a drop of 2.6" between April 1992 and September 18, 1992. Dry well scans have offered no indication of a tank leak. The dry wells were read last on September 24th.

- Dry well readings have been increased from quarterly to weekly, beginning on Monday, October 5, 1992. Gross gamma technology is being used for the dry well readings.

- 101-T has had a stable surface level since the baseline was established in August 1982. In December 1991, the surface level reading, which is taken by an FIC measurement device, was 44.2". The FIC device then malfunctioned and no further readings could be taken until April 1992, when the surface level still read at 44.2". The FIC malfunctioned again, and was repaired. Readings taken in June 1992 indicated a drop in surface level of 1.6", however the FIC device was listed as "off", or out of service. The FIC was repaired on September 18, 1992, and was reported to be functioning properly. The level reading was 41.6". On October 1 and 2, 1992, the FIC was calibrated, checked by maintenance personnel, and the level in tank 101-T now reads 42.6". The inability to obtain consistent readings with the instrument has not been resolved.

**BACKGROUND INFORMATION - 241-T-101 (Page Two)**

- The current FIC reading, a decrease of 1.6" from the December 1991 surface level reading, represents a volume equivalent of about 5,000 gallons. A surface level decrease of 2.6" in 101-T is a volume equivalent of approximately 7,100 gallons.

- Westinghouse is gathering additional data and use alternative measuring equipment to confirm the reading of the FIC device.

- An FIC device is an automatic waste surface level measuring device manufactured by the Food Instrument Company. The device can provide a digital display of the data and transmit the date to tank farms' Computer Automated Surveillance System (CASS).

- Work by Tank Waste Remediation System Division personnel has been ongoing during 1991 and 1992 in preparation for a future tank leak. Projects completed to date include:

  - Leak response plan for all single-shell tanks.
  - Construction of an emergency pumping trailer.
  - Safety assessment for pumping a ferrocyanide (FeCn) watch list tank.
  - Criticality safety evaluation of pumping single-shell tanks.

- Planning is under way for emergency pumping of tank 101-T if it is declared to be leaking. The work required includes:

  - Pump installation.
  - Integrity verification of waste transfer piping.
  - Evaluation of waste compatibility with double-shell tank 102-SY, the tank which would receive the waste from 101-T.
  - Formalization of necessary work procedures and safety reviews.

- Westinghouse Hanford Company has not completed detailed planning at this time, but preliminary plans estimate that this work will require up to three months to complete.

- There are 177 waste storage tanks at Hanford. 149 are of single-shell construction and were built between 1943 and 1944. The 28 double-shell tanks at Hanford were constructed between 1973 and 1986. 66 single-shell tanks are known or assumed to have leaked. No double-shell tank has leaked.

- Westinghouse Hanford Company is the management and operations contractor for the U.S. Department of Energy's Hanford Site in southeastern Washington.

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**Contact:**
**Craig Kuhlman**
**(509) 376-6826**
**(509) 627-1117**

# Single-Shell Tanks
# Interim Stabilization/Isolation

T. E. Rainey

Single-Shell Tank Unit Managers Meeting
Plans For Fiscal Year 1993

November 4, 1992

Handout 3

| PLANNED ACTIVITY | EST. COMPLETION DATE |
|---|---|
| PROVIDE REVISED CONTINGENCY PLAN FOR LEAKS FROM 241-C-106 TO EPA AND ECOLOGY. | JAN 1993 |
| UPGRADE LEAK DETECTION AND SITE CHARACTERIZATION AT TANKS 241-C-105 AND 241-C-106. | |
| INITIATE MONTHLY PSYCHROMETERIC MEASUREMENTS AT 241-C-105 AND 241-C-106 COMMENCING FISCAL YEAR 1993, TO BE TAKEN WHILE EXHAUSTERS ARE OPERATING. | COMPLETE |
| COMPLETE PHYSICAL LOGGING OF 14 DRYWELLS AT 241-C-105 AND 241-C-106 USING A SPECTRAL GAMMA PROBE. | MAR 1993 |
| REDUCE THE LOGGING SPEED OF THE GROSS GAMMA PROBES FOR THE 14 DRYWELLS AROUND 241-C-105 AND 241-C-106. | COMPLETE |
| PROVIDE TO EPA AND ECOLOGY A PLAN FOR FURTHER IMPROVEMENTS IN GROSS GAMMA PROBE. | DEC 1992 |

## IMPROVE EMERGENCY LEAK RESPONSE

COMPLETE SAFETY ANALYSIS REPORT ADDENDUM TO ALLOW ALTERNATE METHODS FOR TRANSFER OF RADIOACTIVE WASTE WITHIN SINGLE-SHELL TANK FARMS. SEP 1993

INITIATE RESTORATION OF 244-U, DOUBLE-CONTAINED RECEIVER TANK.

INITIATE SAFETY STUDY ANALYSIS INTERIM STABILIZATION OF ALL REMAINING NONWATCHLIST TANKS. THIS STUDY TO INCLUDE:

1) TRANSFER SYSTEM INTEGRITY
2) EFFECT OF INTERIM STABILIZATION ON TANK CORROSION
3) EFFECT OF INTERIM STABILIZATION ON CRITICALITY SAFETY
4) OTHER POTENTIAL SAFETY CONCERNS

## IMPROVE EMERGENCY LEAK RESPONSE (continued)

INITIATE SAFETY STUDY ANALYSIS ON INTERIM STABILIZATION OF ALL REMAINING WATCHLIST TANKS. THIS STUDY TO INCLUDE:

1) FERROCYANIDE TANKS
2) HYDROGEN/FLAMMABLE GAS TANKS
3) ORGANIC TANKS

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# SINGLE-SHELL TANK CHARACTERIZATION

# MILESTONE M-10-00

Paul Hernandez - USDOE/RL
John Propson - WHC

Single-Shell Tanks Unit Managers Meeting

November 4, 1992
Richland, Washington

Handout 4

# SINGLE-SHELL TANK CHARACTERIZATION MILESTONE M-10-00

## TOPICS

- Accomplishments
- Special Topics
- FY 1993 Planned Activities
- Issues and Concerns

# ACCOMPLISHMENTS

- Completed WHC Readiness Review for 241-T-107 (FeCN) Vapor Space and Core Sampling.
- One data package each from Tank C-112 and T-111 are currently being validated.
- Updated Waste Characterization Plan is in review.
- Received conceptual approval from the State Departments of Health and Ecology to use an off-the-shelf exhauster for initial rotary mode sampling activities (see special topics).
- Completed the Master Core Sampling Schedule detailing the waste tank sampling schedule through 1998 based on current TWRS priorities.
- Completed TPA Milestone M-10-06 23 days ahead of schedule on September 7, 1992.

# SPECIAL TOPICS

- M-10-13-T2 complete R & D and installation of hard salt cake sampler and hydrostatic balance system - December 1992
  - Instrumentation cabinet complete
  - Pressure system complete
  - Purge control cabinet installed
  - Universal sampler complete
  - Centering device complete
  - Drill bit complete
  - On schedule for December 1992 completion

- M-10-13 complete rotary mode sampler deployment - September 1993

# SPECIAL TOPICS (con't)

- Rotary exhauster
  - Met with WDOE and Department of Health - September 15 and October 27. Received approval for off-the-shelf exhauster and broad brushed BACT (using best engineering vapor estimate).
  - The decision of the group was to wait for the new vapor sampler and actual core samples from several farms before proceeding with a BACT special design rotary exhauster.

- Tank 241-C-106 characterization status
  - Safety documentation and environmental assessment requirements under review
  - Sampling scheduled for December 1992/January 1993

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# FY 1993 PLANNED ACTIVITIES

- Issue TWRS Tank Waste Characterization Plan
- Evaluate Milestones M-10-07 thru M-10-12 based on TWRS decision
- Complete R & D and installation of Hard Salt Cake Sampler and Hydrostatic Balance System M-10-13-T2
- Complete Rotary Mode Sampling Deployment M-10-13
- Continue push mode core sampling - near term schedule includes Tanks T-107, C-108, and C-111 (All FeCN)
- Analyze 13 single-shell tanks and issue validated data packages

# ISSUES AND CONCERNS

| | |
|---|---|
| **ISSUE / CONCERN** | **The portable modular exhauster for the rotary mode sampling system is a critical path element** |
| **CORRECTIVE ACTION** | **State regulatory agencies have given conceptual approval of an off-the-shelf exhauster for initial rotary mode sampling activities** |
| **ISSUE / CONCERN** | **Current laboratory throughput is unable to keep pace with the TPA 216 day turnaround requirement** |
| **CORRECTIVE ACTION** | **WHC Laboratories are implementing upgrades and procedural improvements which will allow issuance of validated data packages within the 216 day requirement as of April 1, 1993.** |

November 4, 1992

| TOTAL FY 93 AEU's | | | | |
|---|---|---|---|---|
| TANK | TOTAL AEU | 222-S | 325 | CARRY OVER |
| T-111 | 0.01 | - | 0.01 | - |
| B-202 | 0.02 | 0.01 | 0.01 | - |
| B-201 | 0.40 | - | 0.40 | - |
| B-111 | 1.15 | - | 1.15 | - |
| C-110 | 0.34 | 0.25 | 0.09 | - |
| BX-107 | 0.48 | 0.42 | 0.06 | - |
| S-104 | 1.63 | 1.53 | 0.10 | - |
| T-104 | 1.16 | 1.10 | 0.06 | - |
| C-112 | 0.10 | - | 0.10 | - |
| C-109 | 3.30 | - | 3.30 | - |
| BY-104 | 0.06 | 0.06 | - | - |
| T-107 | 1.80 | 1.71 | 0.09 | - |
| C-111 | 2.70 | 2.57 | 0.13 | - |
| C-108 | 2.70 | - | 2.70 | - |
| AZ-101 | 1.00 | - | 0.40 | 0.60 |
| AZ-102 | 1.00 | - | 0.60 | 0.40 |
| C-106 | 1.80 | - | 1.80 | - |
| AN-107 | 0.90 | 0.20 | - | 0.70 |
| T-101 | 1.80 | 0.70 | - | 1.10 |
| C-103 | 1.80 | 0.15 | - | 1.65 |
| BX-102 | 1.80 | 1.10 | - | 0.70 |
| Contingency Tank | 1.00 | 0.90 | 0.10 | - |
| HWVP | 1.3 | - | 1.3 | - |
| 242A OPERATIONS | 10.6 | 10.2 | .4 | - |
| GROUT | 1.8 | 1.10 | .7 | - |
| Operable Units | 1.5 | - | 1.5 | - |
| TOTAL | 42.15 | 22 | 15* | 5.15 |

* Additional work added as HWVP is considered being low probability of occuring as planned.

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November 4, 1992

# FY 93 222-S AEU FLOW

| | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Work in house at mo. start (excluding FY 94 carry over) | 3.37 | 3.58 | 5.25 | 6.35 | 5.16 | 5.23 | 5.54 | 6.31 | 5.18 | 4.55 | 3.41 | 1.78 |
| Work complete at mo. end | 1.5 | 1.6 | 1.4 | 1.7 | 1.7 | 1.8 | 1.9 | 2.0 | 2.0 | 2.1 | 2.1 | 2.2 |
| New Tank Core work in (excluding FY 94 carry over) | 1.71 | 2.57 | .9 | | | | | | 1.1 | .7 | .20 | .15 |
| Other work * in | | 0.7 | 1.6 | .51 | 1.77 | 2.11 | 2.67 | .87 | .27 | .26 | .27 | .27 |

* Evaporator & Grout

November 4, 1992

# FY 93 325 AEU FLOW

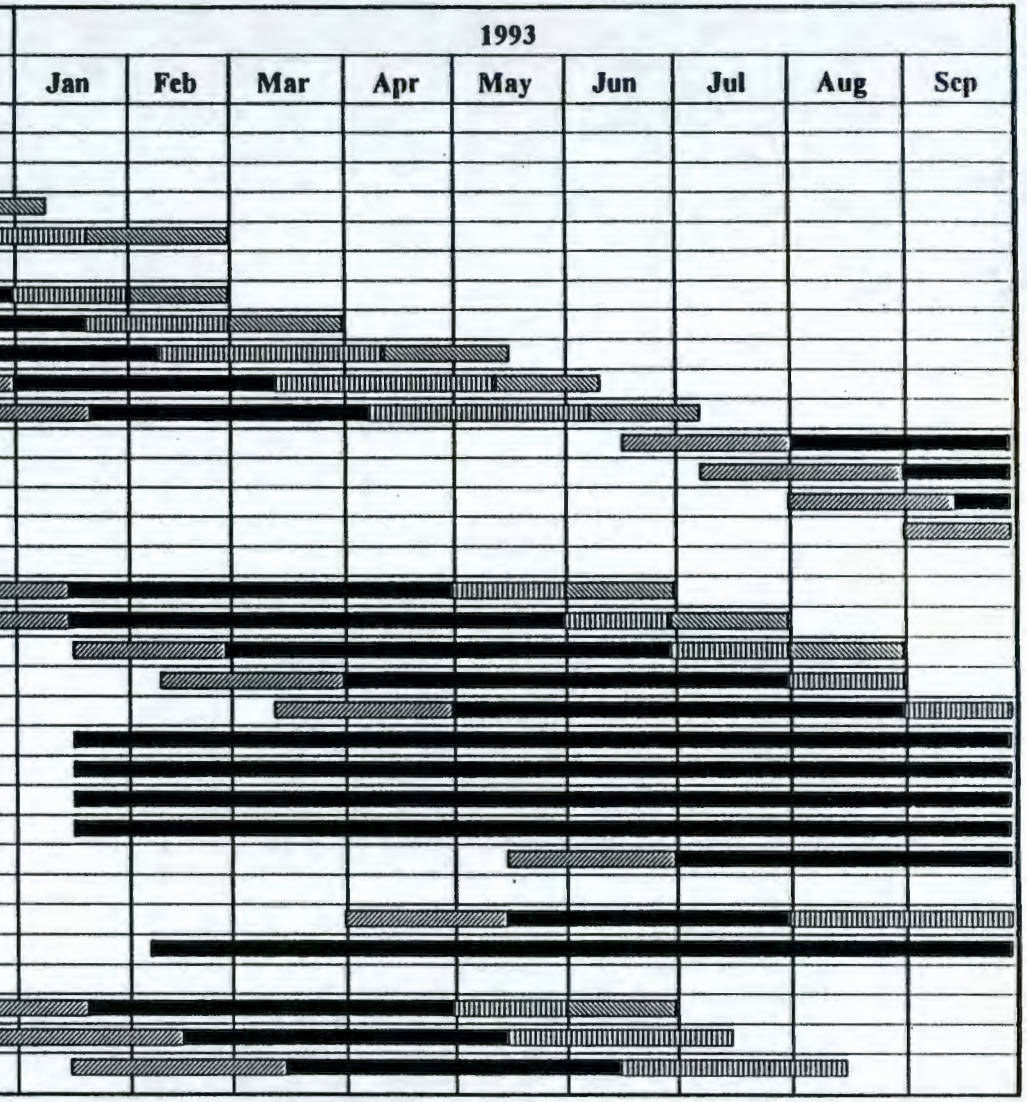
| | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Work in house at mo.start (excluding FY 94 carry over) | 5.06 | 4.12 | 3.26 | 5.37 | 5.84 | 7.48 | 6.67 | 5.76 | 5.20 | 4.45 | 3.30 | 2.15 |
| Work complete at mo. end | 1.0 | 1.0 | 0.9 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 |
| New Tank Core work in (excluding FY 94 carry over) | .06 | .07 | 2.88 | .13 | 1.90 | | | .6 | .4 | | | |
| Operable Unit work in* | | .07 | .13 | .14 | .14 | .14 | .14 | .14 | .15 | .15 | .15 | .15 |
| HWVP | | | | 1.3 | | | | | | | | |
| Other Work in ** | | | | | .7 | .25 | .15 | | | | | |

* Preliminary Estimates
** Evaporator & Grout

# 222-S FY-93 WORK PLAN

11/4/1992

| SAMPLE TYPE | AEU |
|---|---|
| **TANK CORE** | |
| T-111 | 0.00 |
| B-202 | 0.01 |
| C-110 | 0.25 |
| BX-107 | 0.42 |
| BY-104 | 0.06 |
| S-104 | 1.53 |
| T-104 | 1.10 |
| T-107 | 1.71 |
| C-111 | 2.57 |
| Contingency tank | 0.90 |
| BX-102 | 1.10 |
| T-101 | 0.70 |
| AN-107 | 0.20 |
| C-103 | 0.15 |
| **EVAPORATOR** | |
| AP-101 (R) | 1.00 |
| AP-107 (R) | 0.40 |
| AP-108 (R) | 0.60 |
| FEED SAMPLES | 1.50 |
| SLURRY SAMPLES (R) | 1.50 |
| SLURRY SAMPLES (PC) | 0.30 |
| PROCESS CONTROL | 0.60 |
| COOLING WATER (PC) | 0.10 |
| STEAM COND. (PC) | 0.10 |
| VESSEL VENT. (R) | 0.60 |
| **STORAGE** | |
| TANK SUPERNATE (R) | 2.40 |
| HIGH LEVEL (PC) | 1.10 |
| **GROUT** | |
| 102-AP | 0.70 |
| 105-AP | 0.20 |
| 106-AP | 0.20 |




HOT CELL & SAMPLE PREP. ANALYSIS REPORT PREP. VALIDATION & RELEASE

# 325 FY-93 WORK PLAN

11/4/1992

| SAMPLE TYPE | AEU | 1992 | | | 1993 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| **TANK CORE** | | | | | | | | | | | | | |
| B-201 | 0.40 | | | | | | | | | | | | |
| C-112 | 0.10 | | | | | | | | | | | | |
| B-202 | 0.01 | | | | | | | | | | | | |
| T-111 | 0.01 | | | | | | | | | | | | |
| B-111 | 1.15 | | | | | | | | | | | | |
| C-109 | 3.30 | | | | | | | | | | | | |
| C-110 | 0.09 | | | | | | | | | | | | |
| BX-107 | 0.06 | | | | | | | | | | | | |
| S-104 | 0.10 | | | | | | | | | | | | |
| T-104 | 0.06 | | | | | | | | | | | | |
| T-107 | 0.09 | | | | | | | | | | | | |
| AZ-101 | 0.40 | | | | | | | | | | | | |
| AZ-102 | 0.60 | | | | | | | | | | | | |
| HWVP | 1.30 | | | | | | | | | | | | |
| C-111 | 0.13 | | | | | | | | | | | | |
| Contingency tank | 0.10 | | | | | | | | | | | | |
| C-108 | 2.70 | | | | | | | | | | | | |
| C-106 | 1.80 | | | | | | | | | | | | |
| C-106 | | | | | | | | | | | | | |
| **EVAPORATOR** | | | | | | | | | | | | | |
| AP-101 | 0.20 | | | | | | | | | | | | |
| AP-107 | 0.10 | | | | | | | | | | | | |
| AP-108 | 0.10 | | | | | | | | | | | | |
| **GROUT** | | | | | | | | | | | | | |
| 102-AP | 0.40 | | | | | | | | | | | | |
| 105-AP | 0.15 | | | | | | | | | | | | |
| 1-6-AP | 0.15 | | | | | | | | | | | | |
| **OPERABLE UNIT** | | | | | | | | | | | | | |
| SOIL & WATER | 1.50 | | | | | | | | | | | | |

SAMPLE PREP & ANALYSIS

VALIDATION & RELEASE (WIIC)

REPORT PREP.

☆ DELIVERABLE TURNAROUND TIME AVERAGE IS AT 75 DAYS - MAX 90 DAYS

9 3 1 2 7 6 3 1 0 2 2

# SINGLE-SHELL TANK RETRIEVAL TECHNOLOGY DEVELOPMENT

## Milestone M-06-00

W.R. Wrzesinski, DOE
M.K. Mahaffey/E.J. Shen, WHC

November 1992

Handout 6

# Milestone Description

| | |
|---|---|
| ▪ M-06-00 | Develop single-shell tank waste retrieval technology and complete scale model testing. |
| ▪ DELIVERABLE(S) | Demonstrate retrieval technology for single-shell tank waste forms including sludge, saltcake and in-tank hardware. Show technology for support, control and deployment systems. Demonstrations to be performed in scale model tank, using simulated waste. (Supports M-07) |
| ▪ BASELINE SCHEDULE | Complete milestone in June 1994. (Two interim milestones completed) |

## Open Commitments

| | | |
|---|---|---|
| ACTION ITEM | - | Set up meeting that provides a detailed briefing to the regulators on M-06-00. |
| Responsibility | - | B. L. Nicoll, DOE |
| Due Date | - | February 26, 1992 |
| Status | - | Briefing on the technology to support M-06-02 is no longer needed due to the completion of the milestone. Technical briefings to State and EPA on M-06-00 completion definition can be made near end of this fiscal year. |

# Accomplishments (Last three months)

- M-06-02 "Start of Testing" Completed

Demonstration 09/24/92 - Hanford 337 High Bay

- Remote robotic deployment of end effectors
- Salt cake water cannon
- 2" pipe cutter
- Sludge mobilization and transport
  20 gpm, dilution 4:1

Supported by

- Viewing systems
- Characterization
- Sensors
- Positioning systems
- Control system

# Accomplishments (Last three months) continued

- Retrieval Systems Evaluations - Non-robotic - Completed
  - Bureau of Mines - WHC
  - Scarifier - PNL
  - Barriers - LATA

  Reports in clearance process.

- Barriers Demo
  - Test bed completed in FY 92
  - Funding for this area being reviewed for FY 93

- Workshop on Retrieval Activities Oct. 7-8
  - USTID Technical Steering Group

# Planned Actions (Next six months)

November 1992 Demonstration for Industry and Media
in 337 High Bay

Salt Cake Rubbelizer and Post Rubbelizer Development Initiated

Optimization of Sludge Mobilization End Effector Parameters

Testing of 4" Pipe Cutter Initiated

Scarifier for Soft and Hard Waste Test Planning

# MILESTONE ASSESSMENT

- **Schedule**
  - M-06-01 "Identify Technologies" Completed October 1990
  - M-06-02 "Start of Testing" completed September 1992
  - Complete planning for M-06-00 "Complete Scale Model Testing" definition in FY 93 to support June 1994 milestone completion date.

## MILESTONE ASSESSMENT (cont'd)

- Technical Scope
  - 1/8 Sector, Full-Scale Tank Mockup in 337 High Bay Proposed for all Robotics Demonstrations
  - Multi-Laboratory Approach to End Effector Development for Various Waste Forms
    - WHC Sludge
    - Lawrence Livermore Saltcake
    - Sandia In-Tank Hardware
  - Other Scope Being Evaluated for Milestone Completion

# FULL-SCALE DEMONSTRATION OF WASTE RETRIEVAL TECHNOLOGY

## Milestone M-07-00

J.P. Harris, WHC
W.R. Wrzesinski, DOE

November 4, 1992

Handout 7

# Milestone Description

| | |
|---|---|
| • M-07-00 | Initiate full-scale demonstration of waste retrieval technology |
| • DELIVERABLES | Deliverable Initiation is defined as startup of the waste retrieval equipment in the selected single-shell tank |
| • BASELINE SCHEDULE | Initiate retrieval operations - October 1997 |

# OPEN COMMITMENTS

- None

# Accomplishments (Last three months)

- Prepared draft of M-07 Tank Selection criteria and recommendations (M-07-01)

  - Selection criteria (top level):

    - Resolution of tank safety issues
    - Compliance with regulatory requirements
    - Proceed with waste disposal
    - Tank space logistics
    - Full size SST for demonstration of reference SST retrieval technologies

  - Plan reviewed by DOE, comments being incorporated

# Accomplishments (Last three months) (Cont)

- Tank C-106 Early Retrieval Plan provided to the regulators (September 1992)

- Initiated discussions on Tank C-106 Sluicing with Washington Department of Health (DOH)

  - DOH regulators encouraging in their support of waste retrieval strategy

  - regulators receptive to discussions on phased permitting approach for retrieval of waste from C-106

- Initiated development of required cost, schedules, and technical information to support C-106 retrieval effort

# Planned Actions (Next six months)

- Complete M-07 tank selection (M-07-01 and 02)

- C-106 Sluicing Effort

  - Engineering Studies/Analyses
  - Field walk-downs in support of preliminary design
  - Preparation of Functional Design Criteria
  - Work Planning for the following:
    - Operations Work Plan
    - Quality Assurance Plan
    - Detailed Design
  - Preliminary Design
  - Regulatory compliance/safety documentation
    - Initiate safety documentation
    - Initiate environmental documentation (RCRA, CAA, NEPA)

- Complete initial tank leak study

- Consensus on sluicing as acceptable method for C-106 retrieval

# Milestone Assessment

- **Schedule**
  - If sluicing is allowed for SST waste retrieval, initiation of retrieval by 10/97 possible

# Milestone Assessment (Cont)

- **Technical Scope**

  - Retrieval options for M-07 tank include both sluicing and long reach manipulator systems (reference technologies)

  - Propose to initiate retrieval demonstration with sluicing

  - Complete 95% waste retrieval with long reach manipulator system, if required

9 3 1 2 7 6 3 1 0 3 8

# FULL-SCALE SINGLE-SHELL TANK FARM CLOSURE DEMONSTRATION

## Milestone M-08-00

W.R. Wrzesinski, DOE
J.P. Harris, WHC

November 4, 1992

Handout 8

# Milestone Description

| | |
|---|---|
| • M-08-00 | Initiate full-scale tank farm closure demonstration project |
| • DELIVERABLES | Initiation is defined as full-scale waste retrieval |
| • BASELINE SCHEDULE | Initiate full-scale closure demonstration - June 2004 |

# OPEN COMMITMENTS

- None

# Accomplishments (Last three months)

- Initiated planning required for waste retrieval.

# Planned Actions (Next six months)

- Initiate studies on selection of the tank farm for the M-08 demonstration
- Initiate upgrade engineering studies on tank farm upgrades to support retrieval for M-08
- Perform retrieval-closure interface planning

# Milestone Assessment

- **Schedule**

  - Activities planned for FY 1993-1994 will support M-08 demonstration
    - Engineering studies and functional design criteria development
    - Technology evaluations
    - Initiation of conceptual design
    - Detailed planning and scheduling
    - Support to NEPA documentation preparation for the SST EIS

# Milestone Assessment (cont)

- **Technical Scope**
  - Current TWRS plans are to demonstrate retrieval of waste for entire tank farm as part of closure demonstration
  - May require accelerated closure plan development and negotiation for the M-08 farm

- **Budget vs. Cost**
  - No funding identified for M-08 related activities during FY 1992
  - No impact on M-08 scheduled completion dates

# FERROCYANIDE SAFETY PROGRAM

## INSTALLATION OF THERMOCOUPLES

PRESENTED TO
WASHINGTON DEPARTMENT OF ECOLOGY

NOVEMBER 4, 1992
G. T. DUKELOW

Handout 9

# PURPOSE OF BRIEFING

- Discuss with State (Ecology) the methods under consideration for installation of thermocouple (TC) trees in 14 assumed leaker ferrocyanide tanks
- Formal agreement may be acknowledged by review of Environmental Assessment

## FERROCYANIDE SAFETY ISSUES

- Stoichiometric mixtures of cyanide compounds and nitrates/nitrites are explosive.
  - CN, $Fe(CN)_6$, or $NiFe(CN)_6$ are approximately the same per mole.
- Reaction initiation requires heating to 285°C [545°F] or an intense electrical spark.
- Up to 83,000 g-moles (39,000 lbs) of $Fe(CN)_6$ in 241-BY-104.
- 140 metric tons of ferrocyanide in 18 of 24 tanks.
- Key Safety indicating parameters.
  - Temperature
  - Moisture
  - Concentration & Inventory

# WHY THERMOCOUPLE (TC) TREES NEEDED

Equipment required to monitor potential safety issue

- Surveillance to detect increasing or high temperatures

- Replacement for old, failing thermocouples
  - adds redundancy

- Adds second TC trees
  - Needed to confirm hot spot modeling & thermal behavior
  - Adds to knowledge of temperature and waste homogeneity

- New TC trees will be calibrated and will add confidence to present temperature knowledge

- New thermocouples will be replaceable

# BACKGROUND

- EA/FONSI approved for installation of TC trees in 10 non-leaker ferrocyanide tanks
- 14 assumed leaker tanks not included in EA\FONSI because alternative installation techniques using less water were to be reviewed and experience gained in installation in non-leaker tanks (minimize water additions to tanks)
- Method of installation has used the historical method of sluicing the TC tree into the tanks, which used up to 1500 gallons of water
- Four (4) TC trees were installed in Sept. 1992 using from 70 to 260 gallons of water in each of the tanks

- Assuming the same difficulty of installation, leaker tank with most solids could use about 500 gallons of water
- Possibility of having to add 1500 gallons
- Using conventional techniques Liquid Observation Wells have, in the past, also used up to 1000 gallons for installation

# STABILIZATION BACKGROUND

- Interim Stabilization
  - Criteria: <5000 gallons supernate

    and:

    <50,000 gallons drainable interstitial

  - 7/14 Assumed leaker tanks currently interim stabilized

- Water addition goal will not exceed interim stabilization criteria

## ALTERNATIVE INSTALLATION TECHNIQUE STUDY

- Investigating several different techniques
- High pressure water and mechanical discs on bottom of TC tree
  - Discs mounted on bottom of TC tree; hand rotate during insertion
  - Water pressure from 2000 - 10,000 PSI; water flow of less than 1.8 GPM as compared to 12 - 30 GPM using conventional method

- High pressure water and steam
  - Steam would result in elevating water temperatures to assist in dissolution of the solids
  - Pressures similar to above
- High pressure water
  - Same as above except without the hot water or the cutting discs
- Combination of above using different pressures and nozzle configurations
- Have rejected techniques such as vibratory drilling, rotary drilling, pneumatic ram, and hydraulic ram

## GOALS FOR NEW INSTALLATION TECHNIQUES

- Add less than 100 gallons of water; value chosen as being consistent with minimal volumes required for normal operation and maintenance
- Maintain temperature less than 180 C; stay well below potential ferrocyanide reaction propagation temperature
- Vapor space pressure not to be measurably increased
- Minimize aerosols to insure no increased emissions from the tank

# TESTING PROGRESS TO DATE

- Testing has used KAMAG simulant material which has been used in the past for rotary core drilling tests; future testing will use improved tank simulants
- Experience to date has tentatively eliminated use of steam due to excessive amounts of water required
- Mechanical discs have been fabricated and are in process of being tested
- High pressure pump is being repaired at the manufacturer
- Tests of various options will be completed using high pressure pump

# SCHEDULE

- Complete conceptual testing by January to support initiation of safety and environmental documentation
- Submit safety and environmental documentation to DOE by March 30, 1993
- DOE approve FONSI and authorize work before September 1993

## POTENTIAL FOR LIMITED INSTALLATION

- Recent installations and reevaluation have indicated that at least 4 leaker tanks could have TC trees installed, using conventional technique, that would add less than 100 gallons of water
- Solids levels are less than 3 feet
- Would require change to the safety and environmental documentation; approvals might require nearly as long as new documentation using new technique
- May include above option into new documentation

## SUMMARY

- Water addition by either conventional or new techniques, will not alter stabilization status
- Installation of TC trees into assumed leaker tanks is necessary to monitor temperatures as one of the primary means to insure ferrocyanide tank safety
- Determine whether existing SA and EA can be modified and approved in a timely manner to allow use of conventional technique to install TC trees in leaker tanks using a nominal 100 gallons
- Complete studies to develop a technique to minimize water addition to assumed leaker tanks

- Evaluate whether new technique is viable and can be used with an acceptable risk, or old technique is still better

- If testing is favorable, proceed with implementation of new technique including preparation of safety and environmental documentation as appropriate

- If development of new technique is not feasible, plan will be to proceed with use of conventional technique

## QUESTIONS/COMMENTS

- Is it worthwhile to develop alternative installation technique to reduce volume added to a SST by an expected 100 - 500 gallons (with the unlikely chance of adding as much as 1500 gallons total)?

- Preparation and approval of new safety and environmental documentation will delay installation by 3 - 6 months

- Are there any other issues Ecology may have on this subject?

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