ADDENDUM I
INSPECTION REQUIREMENTS

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ADDENDUM I

INSPECTION REQUIREMENTS

Contents

I.0 INSPECTION PLAN I.1
I.1 Inspection Plan I.1
I.1.1 General Inspection Requirements I.1
I.1.2 Tank System Inspections and Corrective Actions I.2
I.1.3 Storage of Reactive and Ignitable Wastes I.4
I.1.4 Air Emissions Control and Detection Inspections I.4
I.1.5 Inspection Logs I.4
I.1.6 Schedule for Remedial Action for Problems Revealed I.4

Tables

Table I.1. Visual Inspection Schedule for Tanks, Piping, and Rooms I.6
Table I.2. Inspection Schedule of Safety, Security, and Emergency Equipment I.7
Table I.3. Inspection Schedule for Alarm Monitoring I.8
Table I.4. Inspection Schedule for Maintenance and Other Inspections I.9

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I.0 INSPECTION PLAN

I.1 Inspection Plan

This section describes the method and schedule for inspections of the 242-A Evaporator. The purpose of inspections is to identify situations that might cause or lead to a release of mixed waste that could pose a threat to human health and the environment. Abnormal conditions identified by an inspection must be corrected on a schedule that prevents hazards to the public and environment.

I.1.1 General Inspection Requirements

This section provides an overview of inspections performed at the 242-A Evaporator. A copy of the inspection plan is kept in the 242-A Evaporator control room. There are three general classes of inspections at the 242-A Evaporator:

- Monitoring of remote instrumentations and alarms are performed by operating personnel in the 242-A Evaporator control room using the MCS computer.
- Visual inspections of tanks and equipment are performed by operating personnel. Other inspections of 242-A Evaporator equipment are performed as noted in Tables I.1 through I.4.
- Preventive maintenance of equipment and calibration of instruments are performed by maintenance personnel. A computerized tracking system is used to identify and schedule preventive maintenance and calibration activities.

Preventive maintenance and instrument calibrations on certain equipment might not be possible when the 242-A Evaporator is operating. Because of the limited duration of 242-A Evaporator campaigns, these activities are scheduled during outages between campaigns to avoid interference with operating activities. Inspection of high radiation areas will be addressed on a case-by-case basis.

I.1.1.1 Types of Problems

The 242-A Evaporator inspections include, but are not limited to, the following:

- Condition of tanks and ancillary equipment
- Condition of secondary containment
- Evidence of leaks or overflows from tanks, piping, or transfer lines
- Condition of security equipment
- Condition of safety, communications, and emergency equipment

A schedule of inspections, including items to be inspected, problems to look for, frequency of inspections and responsible organization are provided in Tables I.1 through I.4.

I.1.1.2 Frequency of Inspections

The frequency of inspections is based on the significance of a failure of the equipment and on regulatory requirements, Hanford Site and industry standards, and experience of the nature and frequency of equipment failures.

The frequency of inspections for the 242-A Evaporator is given in Table I.1 through Table I.4. Frequency examples include:

- Daily (at least every 24 hours) - visual inspections of tanks, piping and secondary containment
- Weekly (at least every 7 days) - visual inspections of personal protective equipment, exterior lighting, and posted warning signs
- Monthly (at least every 31 days) - inspections of emergency sirens, fire extinguishers, safety showers, emergency lighting and the spill control kit
- Annually (at least every 365 days) - instrumentation calibrations, cathodic protection system testing, fire inspections

DRAFT

Leak detectors are functionally checked within 92 days of the start of a campaign and every 92 days thereafter until the campaign is over. The frequency of some alarm monitoring is continuous. This means an operator must be present in the control room to monitor alarm instruments that continuously check for conditions such as leaks and high sump levels. Continuous monitoring is only required when the 242-A Evaporator is processing waste.

I.1.2 Tank System Inspections and Corrective Actions

This section discusses the inspections performed on the two tank systems at the 242-A Evaporator: the vapor-liquid separator, C-A-1, and the condensate collection tank, C-100. Inspections include secondary containment and leak and overfill prevention equipment.

I.1.2.1 Overfill Prevention

The vapor-liquid separator, C-A-1, is equipped with instrumentation that alarms before the tank reaches a level where the tank could overflow or entrain liquid waste into the vacuum condenser system. The alarm annunciates in the control room allowing operating personnel to take immediate action to stop the vapor-liquid separator from overfilling.

The condensate tank, C-100, was designed with an overflow line that routes waste to the feed tank, 241-AW-102. This design prevents tank overflow to the condenser room.

I.1.2.2 Visual Inspections

Visual inspections of tanks and secondary containments are performed to check for leaks, signs of corrosion or damage, and malfunctioning equipment. The following rooms containing dangerous waste are inspected:

- Condenser room
- Pump room
- Hot equipment storage room

In addition, the AMU and load out rooms are inspected when dangerous waste is present in the room.

The vapor-liquid separator is located in the evaporator room, with a portion of the recirculation loop located in the pump room. Because of the high radiation dose in the evaporator room, visual inspections cannot be performed. Leaks in the evaporator room drain to the pump room sump; monitoring of the pump room sump instrumentation is performed to determine if leaks have occurred. Visual inspection of the pump room, hot equipment storage room, and load out room is performed through the shielding window on the AMU mezzanine to constrain personnel radiological exposures to levels that are as low as reasonably achievable (ALARA).

I.1.2.3 Alternative Leak Detection During Facility Electrical/Ventilation Outages

As part of facility maintenance, upgrades to facility systems, the need to secure electrical power or ventilation to the 242-A Evaporator facility sometimes becomes necessary. This includes activities such as, but not limited to: cleaning and inspection of the motor control centers (MCCs) for distributing electrical power to the systems at the 242-A Evaporator, ventilation system maintenance and upgrades. Planned electrical or ventilation outages are performed during periods when the facility is not processing Double Shell Tank waste.

During times when access is limited as a result of electrical or ventilation outages, performance of daily inspections as specified in Table I.1 may be impacted. An alternative method of leak detection consisting of the placement of a camera above the floor drain of the Condenser Room to detect the presence of leaks or spills may be utilized. The Process Condensate Tank, located in the Condenser Room, is the only tank, which stores dangerous waste solutions in the facility on a routine basis. It is not normal to provide personnel access into the Condenser Room during extended electrical or ventilation outages unless facility maintenance activities or upgrades require entry. The camera and subsequent television monitor

DRAFT

would be provided electrical power via an alternative source. Operators would complete their daily observations for leaks or spills using this method for the Condenser Room.

The Pump Room, Hot Equipment Storage Room, and Load Out/Loading Room do not have this capability. Facility maintenance activities affecting the electrical power supply to the overhead lighting impacts the performance of inspections for the Pump Room, Hot Equipment Storage Room, and Load Out/Loading Room. Performance of daily inspections is not possible when required as specified in Table I.1. Daily inspections which are unable to be completed by Operations personnel will be documented on operator rounds including the cause for not completing the daily inspections. It should be noted that systems which manage dangerous waste within the Pump Room and the Hot Equipment Storage Room, are flushed and gravity drained to the extent possible after each campaign. Should any remaining liquid leak from primary containment; it would be captured by the secondary containment system and routed to the pump room sump and ultimately to the 241-AW-102 Double Shell Tank. There are two methods for liquids to reach the 241-AW-102 DST from the pump room sump; steam jet or the 10-inch secondary containment overflow line, refer to Addendum C (§C.1.5.2.1) for additional discussion. Quantities of liquid sufficient to reach 241-AW-102 via the 10-inch secondary containment overflow line would cause a change in tank level. DST tank levels are monitored daily and any adverse trend in liquid level would be investigated appropriately to determine its cause.

Electrical outages caused by external events such as the loss of line power to the 242-A Evaporator facility may also trigger the implementation of the previously described alternative measures. Implementation would be dictated by facility status and the anticipated duration of the external events causing the loss of line power. A backup diesel generator and an uninterruptible power supply system is available at the 242-A Evaporator facility to supply power to critical systems in the event of a loss of line power to the facility. Additional discussion on the backup diesel generator and uninterruptible power supply may be found in Addendum F (§F.2.4).

Facility status with regards to the implementation of alternative leak detection during electrical or ventilation outages will be documented. This includes when the facility is returned to a normal configuration and alternative leak detection is no longer necessary.

I.1.2.4 Leak Detectors

The sample enclosures in the load out and hot equipment storage room have leak detectors for both the feed and slurry samplers. For information on these systems and their secondary containment, refer to Addendum C, §C.1.4.

During sampling or maintenance activities associated with the evaporator room, pump room, hot equipment storage room, or load out room, a radiological contamination control curtain may be extended over the load out room to reduce the likelihood of contaminants reaching the environment through the load out door. When extended, the contamination control curtain will limit visibility to the load out room from the shielding window on the AMU mezzanine while completing inspections. When this is the case, inspection forms will denote that the contamination control curtain was extended.

Leaks in the evaporator room, pump room, hot equipment storage room, and load out room drain to the pump room sump. The sump high-level alarm serves as a leak detector for these rooms. For information on the rooms and their drain systems, refer to Addendum C, §C.1.4.

There are conductivity probe leak detectors installed in the secondary containment of the feed transfer line, slurry line, and drain lines connecting the 242-A Evaporator to AW Tank Farm. However, these detectors are considered part of the DST System.

The PC-5000 transfer line may be continuously monitored during transfers by an automated leak detection system (Addendum C) or visually inspected at the LERF Valve HV-43-2. The automated leak detection system alarms are monitored in the 242-A Evaporator Control Room on the Monitoring and Control System (Addendum C, §C.1.6.3.3). Visual inspections of the PC-5000 transfer line are administratively controlled by the Shift Manager and occur at a minimum once every 24 hours during waste water transfers through the PC-5000 transfer line to ensure compliance with

WAC 173-303-640(4)(c)(iii). Visual inspection for leaks from the PC-5000 transfer line are performed by 242-A Evaporator Operations, by looking for signs of any liquid not contributed to rain/precipitation at the open LERF HV-43-2 valve. If any liquid is observed the Shift Manager is notified to take corrective actions.

I.1.2.5 Cathodic Protection

Cathodic protection is not required for the equipment within the 242-A facility boundaries. The only portion of the system, which is underground, is the PC-5000 transfer line. The PC-5000 line is constructed of fiberglass.

I.1.2.6 Tank Assessments

The IAR was issued in 2007 (RPP-RPT-33306). The frequency and nature of these assessments are discussed in the IAR. The IAR is maintained in the 242-A Evaporator operating record.

I.1.3 Storage of Reactive and Ignitable Wastes

A Fire Protection Engineer performs annual fire inspections of the 242-A Evaporator. The assessment includes the date and time of the inspection, the name of the professional inspector, a notation of the observations made, and any remedial actions which were taken as a result of the inspection. The completed fire protection facility assessment is included in the operating record.

I.1.4 Air Emissions Control and Detection Inspections

The process vent at the 242-A Evaporator is subject to 40 CFR 264, Subpart AA, which requires organic emissions be limited to 1.4 kilograms per hour, and 2.8 megagrams per year, or controls be installed to reduce organic emissions by 95 percent. Organic concentrations in the waste processed at the 242-A Evaporator are limited to ensure the values of 1.4 kilograms per hour and 2.8 megagrams per year are not exceeded. Therefore, no emission control devices are installed on the 242-A Evaporator vessel ventilation system and no inspections are required (Addendum C, §C.2).

I.1.5 Inspection Logs

Visual inspections (Table I.1- Table I.4) are performed using inspection log sheets (also called round sheets) that outline frequency, the components to inspect, operating conditions and ranges, and types of problems. Log sheets are kept in the 242-A Evaporator control room. Inspectors record the following information:

- Date and time of the visual inspection
- Printed name and signature of the person performing the inspection
- Notations of the observations made, including space for writing comments
- An account of spills or discharges in accordance with WAC 173-303-145

Completed log sheets are reviewed and approved by the shift supervisor, collected, and stored for at least 5 years.

Maintenance inspections are performed as part of the maintenance job control system. After completion, the maintenance documentation is reviewed and signed.

I.1.6 Schedule for Remedial Action for Problems Revealed

If while performing a visual inspection (Table I.1), a leak or spill is discovered, facility management responds immediately per Addendum J, Contingency Plan. Action is taken to stop the leak and determine the cause. The waste is removed from the secondary containment within 24 hours or in a timely manner, that prevents harm to human health and the environment. For spills that drain to the pump room sump, the sump must be jetted. The sump will be triple rinsed in accordance with WAC-173-303-160(2)(b) if the contents include acutely hazardous waste (WAC 173-303-040) or toxic extremely hazardous waste (WAC-173-303-100). Pesticides are not expected to enter this system.

DRAFT

If an alarm activates during inspections, an operator responds immediately and implements appropriate actions.

If an inspection identifies equipment that is missing, damaged, or not operating properly, the operator records the problem on a deficiency log in the 242-A Evaporator control room. Facility management prioritizes repair work to mitigate health and environmental risks.

DRAFT

Table I.1. Visual Inspection Schedule for Tanks, Piping, and Rooms

Item	Inspection	Frequency[1]
Condensate tank and piping	Inspect tank and piping for leaks or corrosion.	Daily
Room Inspections		
AMU room	• Inspect tanks and piping for leaks or corrosion. • Inspect floor for spills or damage. • Inspect for equipment malfunctions. • Inspect for housekeeping.	Daily[2]
Pump room	• Inspect piping for leaks or corrosion. • Inspect floor for spills or damage. • Inspect for equipment malfunctions. • Inspect for housekeeping. • Monitor pump room sump for overflow.	Daily[3]
Hot equipment storage room	• Inspect piping for leaks or corrosion. • Monitor pump room sumps and inspect floor for spills or damage. • Inspect for housekeeping.	Daily[3]
Load out/loading room	• Inspect for housekeeping. • Monitor drains.	Daily[2,3,4]
Condenser room	• Inspect tanks and piping for leaks or corrosion. • Inspect floors for spills or damage. • Inspect for equipment malfunctions. • Inspect for housekeeping.	Daily
IX column room[5]	• Inspect piping for leaks or corrosion. • Inspect floor for spills or damage.	Daily[6]

[1] Continuously: an operator must be present in the control room to respond to alarms when processing waste
Daily: at least every 24 hours

[2] When dangerous waste is present
[3] Use viewing window in AMU room to perform inspection
[4] Denote use of contamination control curtain when extended
[5] IX column was removed in 2003. The remaining piping has been drained and isolated
[6] Surveillance is only required if the piping is returned to service and dangerous waste is reintroduced to the piping

DRAFT

Table I.2. Inspection Schedule of Safety, Security, and Emergency Equipment

Item	Inspection	Frequency[1]
Security		
Building external doors	Verify external doors are closed and locked.[7]	Daily
Posted warning signs	Verify signs are present, legible, and visible at 7.6 meters.	Weekly
Communications		
Crash alarm telephone	Verify crash alarm telephone is operable.	Monthly
Radios	Verify radios are operable and batteries are charged.	Monthly
Telephones	Verify telephones are operable.	Quarterly
Intercom/public address system	Verify systems are working properly.	Quarterly
Emergency Equipment		
Safety showers/ eyewash station	Verify operability.	Monthly
Emergency lighting	Verify operability.	Monthly
Fire extinguishers	Verify fire extinguishers are in their proper location.	Monthly
Spill response kit	Verify spill kit is present.	Monthly
Personal protective clothing	Verify availability.	Weekly
Respirators	Verify availability and shelf life.	Monthly

[1] Continuously: an operator must be present in the control room to respond to alarms
Daily: at least every 24 hours

Weekly: at least every 7 days
Monthly: at least every 31 days
Quarterly: at least every 124 days

[7] Entrances to office areas are allowed to be unlocked

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Table I.3. Inspection Schedule for Alarm Monitoring

Item	Inspection	Frequency[1]	Responsible organization	Comments
Overfill Protection				
Vapor-liquid separator: WFSH-CA11 WFSH-CA12	Monitor for vapor-liquid separator high level.	Continuously	Operations	Surveillance required only when solution is in the vapor-liquid separator.
Leak Detection				
Sampler lines: LDS-SMPL1 LDS-SMPL2	Monitor feed and slurry sampler lines for leaks.	Continuously	Operations	Surveillance required only during feed or slurry sampling.
Pump room sump: WFI-SUMP1	Monitor for leaks in the evaporator room, pump room, load out and hot equipment storage room and loading room. These rooms drain to the pump room sump.	Continuously	Operations	Surveillance required only when waste solution is present in the rooms listed.

[1] Continuously: an operator must be present in the control room to respond to alarms.
Monthly: at least every 31 days
Daily: at least every 24 hours
Biannually: at least every 184 days
Weekly: at least every 7 days
Annually: at least every 365 days

DRAFT

Table I.4. Inspection Schedule for Maintenance and Other Inspections

Item	Inspection	Frequency[1]
Instrumentation Functional Checks and Calibrations		
Leak detectors	Perform leak detector functional checks.	Within 92 days of campaign startup and every 92 days thereafter until the campaign is over
Vapor-liquid separator high level alarms: WFSH-CA11 WFSH-CA12	Perform calibrations of loop instruments.	Annually
Pump room sump level: WFI-SUMP1	Perform calibrations of loop instruments.	Annually
Backup Electrical Equipment		
Diesel generator	Verify operability.	Monthly
Uninterruptible power supply	Verify output voltage and inspect battery for signs of damage or tampering.	Annually
Fire Systems		
Fire suppressant and notification systems (i.e., sprinkler system and fire alarm pull boxes	Water flow alarm tests of the sprinkler system to ensure the operation of a single sprinkler head will transmit an alarm, and that any of the manual fire alarm boxes will properly transmit an alarm signal.	Annually
Visual inspection of the physical condition of the sprinkler system, testing, and calibration of smoke detectors, and testing of heat detectors	A visual inspection of the sprinkler system to ensure system integrity as well as the required testing and calibration of detectors to ensure functionality. A flow test at the sprinkler system is performed to ensure proper flow to the system riser.	Biennially
Fire inspection	Inspect areas where ignitable or reactive wastes are stored per WAC 173-303-395(d)	Annually

[1] Continuously: an operator must be present in the control room to respond to alarms.
Monthly: at least every 31 days
Annually: at least every 365 days
Biennially: every 730 days

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