S-TSR-G-00001

TECHNICAL SAFETY REQUIREMENTS
SAVANNAH RIVER SITE

CONCENTRATION, STORAGE, AND TRANSFER FACILITIES

Revision 23
January 2009

SAVANNAH RIVER SITE
Aiken, SC 29808 • www.srs.gov

PREPARED FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT NO. DE-AC09SR18500

DISCLAIMER

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List of Acronyms and Abbreviations

AC	Alternating Current
ADMP	Advanced Design Mixing Pump
ANSI	American National Standards Institute
API	American Petroleum Institute
ARM	Area Radiation Monitor
ARP	Actinide Removal Process
ASTM	American Society for Testing and Materials
cfh	cubic feet per hour
CFR	Code of Federal Regulations
CLFL	Composite Lower Flammability Limit
CST	Concentration, Storage, and Transfer
CSTF	Concentration, Storage, and Transfer Facility
CTS	Concentrate Transfer System
°C	degrees Celsius
°F	degrees Fahrenheit
DOE	Department of Energy
DSA	Documented Safety Analysis
DWPF	Defense Waste Processing Facility
ERD	HLW Emergency Response Data and Waste Tank Data (N-ESR-G-00001)
EPVE	Emergency Purge Ventilation Equipment
ESP	Extended Sludge Processing
ETP	Effluent Treatment Project
FDB	F-Area Diversion Box
fpm	feet per minute
FPP	F-Area Pump Pit
FPT	F-Area Pump Tank
FOSC	Facility Operations Safety Committee
ft^3	cubic foot
GC	gas chromatograph
GDL	Gravity Drain Line
gpm	gallons per minute
HDB	H-Area Diversion Box
HEPA	High-Efficiency Particulate Air
HLLCP	High Liquid-Level Conductivity Probe
HPFP	High Point Flush Pit
HPP	H-Area Pump Pit
HPT	H-Area Pump Tank
IPI	Installed Process Instrumentation
ISA	Instrument Society of America
ITP	In-Tank Precipitation

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List of Acronyms and Abbreviations (continued)

LCO	Limiting Condition for Operation
LCS	Limiting Control Setting
LDB	Leak Detection Box
LEL	Lower Explosive Limit
LFL	Lower Flammability Limit
LPS	Leak Probe Sleeve
M&TE	Measuring and Test Equipment
MCU	Modular Caustic Side Solvent Extraction Unit
mg/L	milligram per liter
MLDB	Modified Leak Detection Box
MOC	Minimum Oxygen Concentration (for combustion)
N/A	Not Applicable
NCSA	Nuclear Criticality Safety Assessment
NCSE	Nuclear Criticality Safety Evaluation
NFPA	National Fire Protection Association
PC	Performance Category
pH	a measure of acidity or basicity
ppm	parts per million
psi	pounds per square inch
psid	pounds per square inch, differential
psig	pounds per square inch, gage
PVV	Process Vessel Ventilation
QA	Quality Assurance
rem/gallon	roentgen equivalent man per gallon
SAC	Specific Administrative Control
scfh	standard cubic feet per hour
scfm	standard cubic feet per minute
SL	Safety Limit
SMP	Submersible Mixer Pump
SR	Surveillance Requirement
SSCs	Structures, Systems, and Components
STPB	sodium tetraphenylborate
TPB	tetraphenylborate
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question
VFD	Variable Frequency Drive
vol%	volume percent
WC	water column
WSMS	Washington Safety Management Solutions
WSRC	Washington Savannah River Company
wt%	weight percent

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Revision Log

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0	December 2002	Initial issue of complete document
1	March 2003	See Revision 7 for Revision Summary.
2	March 2003	See Revision 7 for Revision Summary.
3	May 2003	See Revision 7 for Revision Summary.
4	May 2003	See Revision 7 for Revision Summary.
5	August 2003	See Revision 7 for Revision Summary.
6	October 2003	See Revision 11 for Revision Summary.
7	December 2003	See Revision 11 for Revision Summary.
8	January 2005	See Revision 11 for Revision Summary.
9	June 2005	See Revision 11 for Revision Summary.
10	July 2005	See Revision 14 for Revision Summary.
11	August 2005	See Revision 14 for Revision Summary.
12	April 2006	See Revision 14 for Revision Summary.
13	October 2006	See Revision 18 for Revision Summary.
14	February 2007	See Revision 18 for Revision Summary.
15	April 2007	See Revision 21 for Revision Summary.
16	June 2007	See Revision 21 for Revision Summary.
17	December 2007	Incorporated TSR Revision 2007-E.
		Revised LCO 3.2.2 and associated Bases to reflect modified flow rate requirement for Tank 48 EPVEs (based on revised uncertainty calculation).
18	February 2008	Incorporated TSR Revisions 2007-C and 2007-F.
		Revised Section 1.1 to remove LCO 3.8.14 conditional statement in the TSR Applicability Section.
		Revised Section 1.6.1. Exceeding 60% LFL due to trapped gas release in OPERATION MODE is not applicable to the organics constituent of Tank 50.
		Modified LCO 3.8.1 and associated Bases. Added conditional Note preceding Required Action A.5.2 for Tank 50.

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Revision Log (continued)

Revision Number	**Date**	**Revision Summary**
18 (cont)	February 2008	Revised LCO 3.8.2 and Bases to exclude Tank 50 from hydrogen monitoring. Excluded Tank 50 from Process Area Applicability. Deleted parenthetical in Required Action A.4 basis. Removed WSRC-TR-2003-00083 (JCO) from the Reference Section. Modified LCO 3.8.4 and associated Bases. Added conditional Note preceding Required Action C.1 for Tank 50. Deleted conditional statement in Note preceding Required Action C.3 for Tank 50. Included trace organics to Required Action C.3 basis. Modified LCO 3.8.14 and associated Bases. Removed conditional statement from Process Area Applicability. Revised Background Summary to include the capability to utilize the temperature limit for flammability calculations. Revised LCO 3.8.3 Bases Process Area Applicability to clarify cross reference to LCO 3.8.2 (cross reference does not include Tank 50). Modified Administrative Control 5.8.2.43.n to add prohibition on jet transfers to Tank 50.
19	March 2008	Incorporated TSR Revision 2007-D. Revised the following Sections, LCOs, and Bases to add two new MODES for Waste Storage Tanks (CHEMICAL CLEANING and MECHANICAL CLEANING) and one new MODE for Transfer Lines (CHEMICAL CLEANING TRANSFER): • Sections 1.2, 1.5, 1.6, 5.2.2, 5.8, and 6.1. • LCOs 3.7.1, 3.7.2, 3.7.3, 3.7.4, 3.7.9, 3.8.1, 3.8.2, 3.8.3, 3.8.4, 3.8.5, 3.8.9, 3.8.10, 3.8.11, 3.8.12, and 3.8.13. • Bases B3/4, B3.7.1, B3.7.2, B3.7.3, B3.7.4, B3.7.5, B3.8.1, B3.8.2, B3.8.3, B3.8.4, B3.8.5, B3.8.6, B3.8.9, B3.8.10, B3.8.11, B3.8.12, and B3.8.13. Minor editorial changes to the following Sections, LCOs, and Bases: • Sections 1.4 and 1.7. • LCOs 3.2.1, 3.2.7, 3.2.10, 3.3.1, 3.3.4, 3.7.5, 3.7.6, 3.7.7, 3.7.10, 3.8.6, and 3.8.14. • Bases B3.2.1, B3.2.7, B3.2.10, B3.3.4, B3.7.6, B3.7.7, B3.7.10, and B3.8.14.

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Revision Number	Date	Revision Summary
20	June 2008	Incorporated TSR Revision 2008-C. Added Tanks 25 through 28 to Administrative Control 5.8.2.39.a. and b., and Table 6.1.2-1 for DSA Sections 4.4.19 and 4.4.20. Corrected B3.8.4 Action A.3 from Condition C to Condition D.
21	August 2008	Incorporated TSR Revision 2008-A. Clarified the following definitions in Section 1.2: BULK SALT DISSOLUTION, CHEMICAL CLEANING TRANSFER (to address SER Revision Issue), CONTINGENCY TRANSFER, INSTRUMENT LOOP (deleted reference to specific INSTRUMENT LOOP numbers), and RAPID GENERATION TANKS. Replaced “barometric breathing” with “atmospheric breathing” in the following definitions in Section 1.2: SLOW GENERATION TANKS and VERY SLOW GENERATION TANKS for consistency. Modified Item 4 for REMOVED FROM SERVICE MODE (to address SER revision issue) in Section 1.6 (clarified isolation of transfer line segments). Also added statement in Section 1.7 which refers to Section 1.6 regarding this isolation. Clarified SRs 4.2.2.4 and 4.8.13.2 for consistency with Bases. Modified the following to clarify CLFL (vs. LFL) for Tank 50: LCO 3.8.4, Section 5.8.2.27, Section 5.8.2.39, Bases 3.8.1, and Bases 3.8.4. Modified Section 5.6.2 to delete reference to Facility Evaluation Board program. Clarified Administrative Control 5.8.2.15 regarding performance of USQ reviews. Clarified/modified (for consistency with DSA) the following Administrative Controls: 5.8.2.21.e, 5.8.2.22, and 5.8.2.39. Clarified Administrative Control 5.8.2.21.n and added transfer control 5.8.2.21.u. Clarified conditional statement of Administrative Control 5.8.2.29. Added actions for pump tank ventilation following a seismic event to Administrative Control 5.8.2.39.

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Revision Log (continued)

Revision Number	Date	Revision Summary
21 (cont)	August 2008	Deleted Administrative Control 5.8.2.43.d.
		Clarified applicability for Administrative Control 5.8.2.50 during HIGH-REM WASTE TRANSFERS through a Type I or II tank annulus in Table 5.8.2-1. Added large liquid additions into Tank 15 to Table 5.8.2-1. Also deleted Footnote (1) for waste tank annulus evolutions in Table 5.8.2-1.
		Clarified/modified (for consistency with DSA) SSCs in Table 6.1.2-1. Revised "Waste Tank Influent Manual Isolation Valves" to "Influent Manual Isolation Valves" in Table 6.1.2-1.
		Added structural integrity (II/I) function for Diversion Boxes, Valve Boxes, Pump Pits, and the Waste Tank Annulus in Table 6.1.2-1.
		Updated references for uncertainty calculations in Bases 3.2.1, 3.2.10, and 3.2.11.
		Added discussion of spontaneous liberation of hydrogen to Background Section of Bases 3.8.1, 3.8.2, 3.8.3, 3.8.9, and 3.8.10.
		Modified "25% LFL" to "hydrogen concentration safety analysis value" in Bases 3.8.1. Added ventilation integrity statement in Bases 3.8.1.
		Modified instrument configuration discussion in B3.8.1, B3.8.9, and B3.8.10.
		Clarified/modified DSA events in Application to Safety Analysis in the following Bases: B3.8.4 and B3.8.10.
		Added provision in Bases 3.8.5 for alarm investigation (prior to entry into Condition A). Replaced "barometric breathing" with "atmospheric breathing" for consistency.
		Clarified Bases 3.8.7 for Condition A entry and deleted paragraph in Condition B regarding Tanks 33 and 34.

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Revision Log (continued)

Revision Number	**Date**	**Revision Summary**
21 (cont)	August 2008	Minor editorial or format changes to the following: • Sections 1.2, 5.8.2.15, 5.8.2.21.r, 5.8.2.25, 5.8.2.46, and 5.8.2.50. • LCOs 3.2.2, 3.2.11, 3.7.8, 3.7.11, 3.7.12, 3.7.13, 3.8.7, and 3.9.1. • Bases B3.2.11, B3.3.1, B3.7.8, B3.8.1, B3.8.2, B3.8.3, B3.8.7, B3.8.9, and B3.8.10.
22	October 2008	Incorporated TSR Revision 2008-E. Modified the ESP SLUDGE SLURRY, HIGH-REM WASTE TRANSFER, and LOW-REM WASTE TRANSFER definitions and added new ESP SLUDGE SLURRY WASTE TANK definition in Section 1.2. Minor editorial changes to RAPID, SLOW, VERY SLOW GENERATION TANK, and WASTE TRANSFER definitions in Section 1.2. Revised LCO 3.2.2 and associated Bases to reflect modified flow rate requirement for Tank 48 EPVEs (based on revised uncertainty calculation). Modified LCO 3.7.4, Table 3.7.4-1 setpoint for the Tank 51 Drain Valve Box. Modified LCO 3.8.4, Required Action C.1 and associated Bases, for supply tank volume (less than or equal to 8,000 gallons). Modified Administrative Control 5.8.2.21.b for sampling verification requirements on Tanks 33 and 34. Modified Administrative Controls 5.8.2.43.m. and 5.8.2.43.n. for new ESP SLUDGE SLURRY WASTE TANK definition. Modified B3.8.1 (Application To Safety Analysis Section) for new ESP SLUDGE SLURRY WASTE TANK definition. Also clarified discussion regarding bases for minimum flow rate values.
23	January 2009	Incorporated TSR Revision 2008-D. Revised Administrative Controls 5.8.2.47.a. and b. to align with changes made in WSRC-SA-6, Rev. 27.

Section 1

Use and Application

1.0 USE AND APPLICATION

1.1 Introduction and Scope

1.1.1 Technical Safety Requirement Applicability

This document contains Technical Safety Requirements (TSRs) for the Concentration, Storage, and Transfer (CST) Facilities in F Area and H Area. The TSRs contain operating limits, Surveillance Requirements (SRs), and administrative controls necessary to protect the health and safety of the public and to minimize the potential consequences to workers from the uncontrolled release of radioactive or other hazardous materials.

For the Actinide Removal Process (ARP) FACILITY (Building 241-96H) and the Modular Caustic Side Solvent Extraction Unit (MCU) FACILITY (Building 241-278H) applicability, the TSRs within this document are applicable once radioactive material is introduced into these FACILITIES.

1.1.2 Methodology

10 Code of Federal Regulations (CFR) 830 and DOE Implementation Guide DOE G 423.1-1, "Implementation Guide for Use in Developing Technical Safety Requirements", governs the methodology and format used in the development of the TSRs. DOE Standard 3009 requires that TSRs be considered for any equipment that is classified as Safety Class or Safety Significant. Chapters 3, 4, and 18 of the Concentration, Storage, and Transfer Facilities Documented Safety Analysis (DSA), WSRC-SA-2002-00007, provides the justification for which Structures, Systems, and Components (SSCs) are Safety Class or Safety Significant. The requirements placed on the equipment and personnel by this document ensure the safety of the offsite public and onsite worker from chemical and radiological hazards associated with these FACILITIES.

1.2 Definitions

-- **NOTE** --

Defined terms in this list appear in capitalized type and are applicable throughout this TSR.

Term	**Definition**
ACTIONS	That part of a TSR that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
ACTUAL MISSING WASTE	WASTE TRANSFER material which is outside the primary containment boundaries of the planned TRANSFER PATH and confirmed by instrumentation or visual inspection. ACTUAL MISSING WASTE does not apply to non-waste material which is outside the primary containment boundaries of the planned TRANSFER PATH during activities which are classified as a WASTE TRANSFER due solely to siphon potential. For this exclusion, it shall be confirmed that no material was siphoned from a waste tank or pump tank.
BULK SALT DISSOLUTION	The planned addition of liquid to a waste tank in order to dissolve salt that has the potential to release a significant amount of hydrogen. Activities listed below, and other activities shown to be similar, are not considered BULK SALT DISSOLUTION and do not require an engineering evaluation. All other planned additions of liquid to a waste tank to dissolve salt are considered BULK SALT DISSOLUTION and require an engineering evaluation to determine the amount of hydrogen potentially released. This engineering evaluation must be completed prior to performing BULK SALT DISSOLUTION.

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1.2 Definitions (continued)

Term	Definition
BULK SALT DISSOLUTION (continued)	Activities in waste storage tanks that disturb a limited quantity of salt (e.g., small salt peaks) or dissolve salt with a limited ability to retain hydrogen (e.g., surface salt on cooling coils) are not considered BULK SALT DISSOLUTION. Examples of the type of activities that need not be considered BULK SALT DISSOLUTION include the following: • Transfer into a salt tank with small exposed salt peaks (height and base in inches not feet) / exposed salt on cooling coils • Flushing of equipment in a salt tank • Sample rinsing • Filling purge condenser seal leg • Routine Evaporator Operation
CHEMICAL CLEANING TRANSFER	A transfer containing oxalic acid (as part of the waste tank chemical cleaning process). CHEMICAL CLEANING TRANSFERS shall be considered WASTE TRANSFERS. Venting and draining of transfer lines associated with a CHEMICAL CLEANING TRANSFER, provided there is no potential to siphon waste, are not considered a CHEMICAL CLEANING TRANSFER nor a WASTE TRANSFER. Once a transfer line has been vented and drained, subsequent transfers need not be considered a CHEMICAL CLEANING TRANSFER.
COMPOSITE LOWER FLAMMABILITY LIMIT (CLFL)	An expression for the minimum concentration of a flammable vapor mixture that is combustible in a dry-air atmosphere.
CONTINGENCY TRANSFER	A transfer of waste from the annulus of a leaking waste tank back to the primary side of the same waste tank using the Contingency Transfer System. Transfers of waste from the waste tank annulus using installed annulus transfer systems are not considered CONTINGENCY TRANSFERS. CHEMICAL CLEANING TRANSFERS using the Contingency Transfer System shall have an inhalation dose potential less than or equal to 9.8E+07 rem/gallon.

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1.2 Definitions (continued)

Term	Definition
ESP SLUDGE SLURRY	ESP SLUDGE SLURRY is a type of WASTE TRANSFER material distinguished by its radiolytic hydrogen generation rate. The radiolytic hydrogen generation rate of ESP SLUDGE SLURRY is greater than 1.5E-5 ft^3/hour-gallon and less than or equal to 5.0E-5 ft^3/hour-gallon. Waste that is being transferred with a radiolytic hydrogen generation rate greater than 1.5E-5 ft^3/hour-gallon must be classified as ESP SLUDGE SLURRY. Classification of material as ESP SLUDGE SLURRY is independent of the inhalation dose potential of the material and is independent of the waste tank containing the material being classified as an ESP SLUDGE SLURRY WASTE TANK.
ESP SLUDGE SLURRY WASTE TANK	Waste Storage Tank that has a total radiolytic hydrogen generation rate greater than 19.6 ft^3/hour and less than or equal to 65.3 ft^3/hour. Classification of a waste tank as an ESP SLUDGE SLURRY WASTE TANK is independent of the transfer material being classified as ESP SLUDGE SLURRY during transfer.
FACILITY	All processes, PROCESS AREAS, and necessary support equipment defined by the CST Safety Basis that are used to perform the mission of any of the CST FACILITIES (e.g., F-Area Tank Farm, H-Area Tank Farm, 299-H).
HIGH-REM WASTE TRANSFER	A transfer of waste that has an inhalation dose potential greater than 2.0E+8 rem/gallon. Some transfers have been evaluated and are categorized as LOW-REM WASTE TRANSFERS (see LOW-REM WASTE TRANSFER definition). Other transfers of waste that have the potential to exceed 2.0E+8 rem/gallon shall be categorized as HIGH-REM WASTE TRANSFERS.
IMMEDIATELY	IMMEDIATELY is used as a Completion Time when a Condition cannot be permitted to continue, and the corresponding Required Action must be initiated without delay and continued until completed, or compliance with the associated Limiting Condition for Operation (LCO) statement is restored, or the LCO is no longer applicable.

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Term	Definition
INSTRUMENT LOOP	The combination of the input device (sensor or input logic device), any signal conditioning elements, and required output devices that are required to complete the TSR action of monitoring, protecting, and/or controlling a parameter and/or piece of equipment. When an INSTRUMENT LOOP is stated in the LCO, any instrument that meets the required uncertainty and the Surveillance Requirements for the instrument in question may be substituted for that instrument.
INSTRUMENT LOOP CALIBRATION	The adjustment, as necessary, of the loop such that it responds within the required range and accuracy to known values of input. The calibration shall encompass the INSTRUMENT LOOP and may be performed by any series of sequential, overlapping, or total steps such that the entire loop is calibrated.
INSTRUMENT LOOP CHECK	The qualitative verification of acceptable performance by observation of INSTRUMENT LOOP behavior. This verification, where possible, includes a comparison of the INSTRUMENT LOOP with another independent INSTRUMENT LOOP, known values, or other circuits/systems monitoring the same variable. An INSTRUMENT LOOP CHECK in the case where two INSTRUMENT LOOPS are available is a comparison of the parameter indicated on one to a similar parameter on another. It is based on the assumption that INSTRUMENT LOOPS monitoring the same parameter should read approximately the same value. Significant deviations between the two INSTRUMENT LOOPS could be an indication of excessive instrument drift in one of the channels or an equipment problem. An INSTRUMENT LOOP CHECK in the case of a single available INSTRUMENT LOOP is a qualitative verification of acceptable performance by observation of INSTRUMENT LOOP behavior. Instrumentation indications consistent with ongoing operations must be observed. An INSTRUMENT LOOP CHECK will detect gross INSTRUMENT LOOP failure; thus, it is key to verifying the instrumentation continues to operate properly between each INSTRUMENT LOOP CALIBRATION.

(continued)

Term	**Definition**
INSTRUMENT LOOP TEST	The injection of a simulated or actual signal (e.g., SETPOINT value) into the INSTRUMENT LOOP, at the output of the transmitter when practical, to verify OPERABILITY of the alarm, interlock, and/or trip functions (as specified in the Bases of the Surveillance Requirement).
LEAK DETECTION LOCATION	A structure or component (e.g., sump, leak detection box) credited to accumulate sufficient liquid waste that escaped primary containment to allow observation (e.g., by leak detection instruments or other methods).
LOW-REM WASTE TRANSFER	A transfer of waste that has an inhalation dose potential less than or equal to 2.0E+8 rem/gallon (including transfers that have been evaluated in the DSA to meet LOW-REM WASTE TRANSFER criteria). The following may be categorized as LOW-REM WASTE TRANSFERS: • Transfers from other facilities that have been shown to be less than or equal to 2.0E+8 rem/gallon by their Waste Compliance Plan • Transfers out of H-Area Type I/II/III/IIIA tanks that implement Administrative Control 5.8.2.19 • Transfers of evaporator bottoms • Transfers out of Type IV tanks • F-Area transfers (restricted to less than or equal to 16.7 wt. % or have an inhalation dose potential that meets the LOW-REM WASTE TRANSFER criteria [as determined by engineering evaluation]). See Administrative Control 5.8.2.21 for additional sampling requirements that apply to transfers out of Waste Tanks 33 and 34. • Transfers out of waste tanks (including Tanks 33 and 34) that do not comply with Administrative Control 5.8.2.19 but the suction of the transfer device (pump or jet) is at or above the sludge layer • CSTF initiated transfers that have been verified by sampling to have an inhalation dose potential of less than or equal to 2.0E+8 rem/gallon

(continued)

Term	Definition
LOW-REM WASTE TRANSFER (continued)	During transfers through a pump tank, the inhalation dose potential of the waste stream leaving the pump tank is assumed to be the same as the inhalation dose potential of the material entering the pump tank (i.e., a LOW-REM WASTE TRANSFER to a pump tank would be considered a LOW-REM WASTE TRANSFER after leaving the pump tank).
MINIMUM OXYGEN CONCENTRATION (MOC)	An expression for the minimum amount of oxygen necessary to support combustion of combustible materials.
MODE	The status or operating condition of the FACILITY or a PROCESS AREA. Section 1.6 describes the individual MODES.
NON-INERTED OPERATION	A Tank 48 ventilation configuration where operation of the ventilation system may result in exceeding MOC for a period of time. NON-INERTED OPERATION requires establishing and maintaining flammable vapor controls as the primary protection against a deflagration in Tank 48 and includes compliance with the bulk vapor space time-to-CLFL requirement of Administrative Control 5.8.2.48.b. NON-INERTED OPERATION commences upon completion of the following: • SRs 4.2.10.5, 4.2.10.6, and 4.2.10.7 • The FACILITY declares the intent to conduct NON-INERTED OPERATION NON-INERTED OPERATION ceases when the following are completed: • Oxygen concentration is less than or equal to 6.9 vol% • The FACILITY declares the intent to exit NON-INERTED OPERATION

(continued)

Term	**Definition**
OPERABLE/ OPERABILITY	A system, subsystem, component, or device shall be OPERABLE when it is capable of performing its specified function(s) and when all necessary support equipment (e.g., instrumentation, controls, electrical power, lubrication, or other auxiliary equipment) required for the system, subsystem, component, or device to perform its specified safety function(s) is also capable of performing its related support function(s). The OPERABILITY of a system, subsystem, component, or device shall be verified by performing SRs at the identified frequency.
PROCESS AREA	A defined FACILITY area, tank, or process. Section 1.7 describes the individual PROCESS AREAS.
RAPID GENERATION TANK	Waste Storage Tank (excluding Tank 48) that has been determined to go from the safety analysis value (nominally 25%) to 100% of the Lower Flammability Limit (LFL) (60% to 100% of the CLFL for Tank 50) in less than 28 days following a loss of ventilation. Waste Storage Tanks for which the time to reach 100% of the LFL (CLFL for Tank 50) has the potential to fluctuate above and below 28 days may remain classified as RAPID GENERATION TANKS. For Tank 50, waste temperature controls are required by LCO 3.8.14. The Flammability Control Program details the programmatic requirements for determining RAPID GENERATION TANKS.
RECOVERY TRANSFER	A transfer of waste or other liquids necessary to stabilize plant conditions or allow deinventory/flushing as needed to support FACILITY repairs.
REPAIR PLAN	An approved FACILITY document that authorizes and controls entry of a PROCESS AREA into the REPAIR MODE. The plan also specifies the controls required for the applicable PROCESS AREA while in the REPAIR MODE. The philosophy, use, and content of a REPAIR PLAN are outlined in Section 5.5 of this TSR.
RESPONSE PLAN	An approved FACILITY document that specifies, based on existing conditions, the detailed plan of action for restoring compliance with the LCO or Administrative Control. The philosophy, use, and content of a RESPONSE PLAN are outlined in Section 5.4 of this TSR. A RESPONSE PLAN can be used to restore compliance with an LCO or Administrative Control.

(continued)

Term	**Definition**
SETPOINT	A predetermined value for actuation of the final device to initiate an alarm or protective action, such as an interlock. The SETPOINT values stated in the TSRs for most INSTRUMENT LOOPS are based on the uncertainty calculations referenced in the associated Bases section. For an INSTRUMENT LOOP to be OPERABLE, its actual SETPOINT must be within the allowable values (as-found condition) and calibration tolerance values (as-left condition) documented on the associated Instrument Scaling and Setpoint Document. The methodology for derivation of the Instrument Scaling and Setpoint Document shall be consistent with ANSI/ISA-67.04.01-2000. SETPOINTS for Radiation Monitoring Equipment are established in accordance with the Radiological Protection Program.
SLOW GENERATION TANK	Waste Storage Tank (excluding Tank 48) that has been determined to have an equilibrium hydrogen concentration greater than or equal to 100% of the LFL (CLFL for Tank 50) (considering the effects of atmospheric breathing), excluding tanks classified as RAPID GENERATION TANKS. Waste Storage Tanks for which the equilibrium hydrogen concentration has the potential to fluctuate above and below 100% of the LFL (CLFL for Tank 50) may remain classified as SLOW GENERATION TANKS. For Tank 50, waste temperature controls are required by LCO 3.8.14. The Flammability Control Program details the programmatic requirements for determining SLOW GENERATION TANKS.
SLUDGE SLURRY TRANSFER	A WASTE TRANSFER that does not comply with the Sludge Carryover Minimization Program (Administrative Control 5.8.2.19).
SOURCE CHECK	The reproducible determination of the response(s) of radiation monitoring equipment (device or system) with a source equivalent to the source used on the system at the time of primary calibration. The SOURCE CHECK shall include the required sensor and alarm.
TRANSFER INITIATION	The starting of the motive force which initiates or re-initiates liquid movement during a transfer, including valve manipulations that have the potential to create a siphon of waste.

(continued)

Term	**Definition**
TRANSFER PATH	A combination of Waste Transfer System transfer lines and interfacing piping whose primary containment constitutes a continuous flow path for a WASTE TRANSFER. See Transfer Lines PROCESS AREA in Section 1.7 for additional information.
VERY SLOW GENERATION TANK	Waste Storage Tank (excluding Tank 48) that has been determined to have an equilibrium hydrogen concentration less than 100% of the LFL (CLFL for Tank 50) (considering the effects of atmospheric breathing), excluding tanks classified as RAPID GENERATION TANKS or SLOW GENERATION TANKS. For Tank 50, waste temperature controls are required by LCO 3.8.14. The Flammability Control Program details the programmatic requirements for determining VERY SLOW GENERATION TANKS.
WASTE TRANSFER	The planned movement of liquid waste along a TRANSFER PATH. This includes movement of waste caused by pumping, jetting, siphoning, or transfer jet/pump flushing activities (via jet entrainment or siphoning). If a transfer of water is known to have a waste siphon potential, the transfer shall be considered a WASTE TRANSFER. A transfer that originated as a non-waste transfer (at the time of TRANSFER PATH determination) does not have to be revised to a WASTE TRANSFER as a result of picking up contamination along the transfer route. If a transfer of non-waste is known to have a waste siphon potential, the transfer shall be considered a WASTE TRANSFER. Transfers from secondary containment sumps are considered to be WASTE TRANSFERS unless the sump contents have a sufficiently low inhalation dose potential that any release could not challenge the Evaluation Guidelines. Transfers out of sumps associated with the TRANSFER PATH of a HIGH-REM WASTE TRANSFER shall be assumed to be HIGH-REM WASTE TRANSFERS (unless the liquid is shown to have an inhalation dose potential less than or equal to 2.0E+8 rem/gallon). Transfers out of these sumps at other times shall be assumed to be LOW-REM WASTE TRANSFERS, unless the sump contents have a sufficiently low inhalation dose potential that any release could not challenge the Evaluation Guidelines.

(continued)

Term	**Definition**
WASTE TRANSFER (continued)	Activities such as removal of contaminated rainwater in-leakage or sampling from inactive locations (stated in Administrative Control 5.8.2.43) are not considered to be WASTE TRANSFERS. Liquid transfers do not have to be considered WASTE TRANSFERS if the transfer stream can be demonstrated to have a sufficiently low inhalation dose potential that hazards (e.g., spills, explosions) posed by the stream could not challenge the Evaluation Guidelines for the affected PROCESS AREAS (exceptions as described in the DSA). Examples of transfer streams that have been shown to not be WASTE TRANSFERS include a) transfers from the CST Facility (CSTF) to the Saltstone Facility, b) transfers from the Effluent Treatment Project (ETP) to CSTF, c) transfers of CSTF Evaporator Overheads to the ETP, and d) transfers into Tank 50 which have inhalation dose potentials less than or equal to 2.09E+5 rem/gallon. Transfers from CSTF to the Saltstone Facility shall comply with the Waste Acceptance Criteria and with Administrative Control 5.8.2.47. Venting and draining of transfer lines where there is no potential to siphon waste is not considered a WASTE TRANSFER. Transfers of waste from a waste tank in MECHANICAL CLEANING MODE are not considered a WASTE TRANSFER.

1.3 Logical Connectors

PURPOSE

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in this TSR to discriminate between, and yet connect, Conditions, Required Actions, Completion Times, surveillances, and frequencies. The only logical connectors that appear in the TSR are "**AND**" and "**OR**." The physical arrangement of these connectors constitutes logical conventions with specific meanings.

BACKGROUND

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left-justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentions of the logical connectors.

When logical connectors are used to state a Condition, only the first level of logic is normally used. In this case, the logical connector is left-justified with the Condition statement. In a few cases, successive levels of logic are used and are identified solely by indenting the logical connector, since subparts of a Condition statement are not numbered separately.

When logical connectors are used to state a Completion Time, surveillance, or frequency, only the first level of logic is used.

(continued)

1.3 Logical Connectors (continued)

EXAMPLES

The following examples illustrate the use of logical connectors.

EXAMPLE 1.3-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO is not met.	A.1 Verify … **AND** A.2 Restore …	

In this example, the logical connector "**AND**" is used to demonstrate that while in Condition A, both Required Actions A.1 and A.2 must be completed.

EXAMPLE 1.3-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO is not met.	A.1 Trip … **OR** A.2.1 Verify … **AND** A.2.2.1 Reduce … **OR** A.2.2.2 Perform … **OR** A.3 Align …	

(continued)

1.3 Logical Connectors (continued)

EXAMPLES (continued)

This example represents a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices. Only one of these choices must be performed, as indicated by the use of the logical connector "**OR**" and its left-justified placement in the table. Any one of these three Required Actions may be chosen. If Required Action A.2 (in this example, A.2 has two Required Actions, A.2.1 and A.2.2) is chosen, then both Required Actions A.2.1 and A.2.2 must be performed, as indicated by the logical connector "**AND**." Required Action A.2.2 (in this example, A.2.2 has two Required Actions, A.2.2.1 and A.2.2.2) is met by performing Required Action A.2.2.1 or A.2.2.2. The indented position of the logical connector "**OR**" indicates that Required Actions A.2.2.1 and A.2.2.2 are alternative choices. Only one of these Required Actions must be performed.

1.4 Completion Times

PURPOSE	The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.
BACKGROUND	LCOs specify minimum requirements for ensuring safe operation of the FACILITY. The ACTIONS section associated with an LCO states Conditions that describe the ways in which the requirements of the LCO can fail to be met. One or more Required Actions and associated Completion Times are specified with each stated Condition.
DESCRIPTION	The Completion Time is the amount of time allowed for completing a Required Action. The Completion Time starts when the LCO Condition is discovered (e.g., inoperable equipment or variable not within limits), provided the PROCESS AREA is in a MODE or specified condition stated in the Applicability section of the LCO. Required Actions must be completed prior to the expiration of the specified Completion Time. A Condition remains in effect, and the Required Actions apply, until the Condition no longer exists or the PROCESS AREA is not within the LCO Applicability. If situations are discovered that require entry into more than one Condition at a time within a single LCO (multiple Conditions), the Required Actions for each Condition must be performed within the associated Completion Time (see Example 1.4-2). When in multiple Conditions, separate Completion Times are tracked for each Condition, starting from the time of discovery of the situation that required entry into the Condition. In some cases, “IMMEDIATELY” is used as a special Completion Time. There is not a definitive time frame associated with “IMMEDIATELY.” However, the Required Actions using “IMMEDIATELY” as a Completion Time shall be pursued without delay and continued until the Required Action is completed. If compliance with the LCO statement is restored or the LCO is no longer applicable, completion of Required Actions using “IMMEDIATELY” as a Completion Time is not required in accordance with LCO 3.0.2. Use of “IMMEDIATELY” implies the highest priority for completion.

(continued)

EXAMPLES

The following examples illustrate the use of Completion Times with different types of Conditions and changing Conditions.

EXAMPLE 1.4-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One purge exhaust fan is inoperable.	A.1 Restore the inoperable purge exhaust fan to OPERABLE status.	7 Days
B. The Required Action and/or associated Completion Time of Condition A are not met.	B.1 Place the affected tank in STANDBY MODE.	8 Hours
	AND	
	B.2 Develop and initiate an approved RESPONSE PLAN to restore compliance with this LCO.	24 Hours
	AND	
	B.3 Perform activities within the affected PROCESS AREA(S) in accordance with an approved RESPONSE PLAN.	N/A

When a purge exhaust fan is declared inoperable, Condition A is entered. If the purge exhaust fan is not restored to OPERABLE status within 7 Days, Condition B is entered, and the Completion Time clocks start for Required Actions B.1, B.2, and B.3. If the inoperable purge exhaust fan is restored to OPERABLE status after Condition B is entered, the Required Actions of Condition B may be terminated.

(continued)

1.4 Completion Times (continued)

EXAMPLES (continued)

The Required Actions of Condition B are to place the affected tank in STANDBY MODE within 8 Hours **AND** to develop and initiate an approved RESPONSE PLAN to restore compliance with the LCO within 24 Hours. If 8 Hours are used to place the tank in STANDBY MODE and no actions have been taken to develop and implement the RESPONSE PLAN, then a total of 16 Hours (not 24 Hours) remain to develop and implement an approved RESPONSE PLAN.

The use of "N/A" (Not Applicable) as a Completion Time for Required Action B.3 denotes those Conditions where predetermined Required Actions and Completion Times cannot be determined. The use of "N/A" means that there is no established time frame when the Required Actions need to be performed. However, the RESPONSE PLAN will contain appropriate Completion Times dependent upon the conditions within the PROCESS AREA.

This discussion does not imply that the Required Actions must be performed in series. The Required Actions can be entered in parallel as long as the Completion Times are not exceeded for each Required Action.

If Condition B is entered while the tank is in STANDBY MODE, the time allowed for developing and implementing the RESPONSE PLAN is the next 24 Hours.

When a second purge exhaust fan is declared inoperable while the first purge exhaust fan is still inoperable, Condition A is not re-entered for the second purge exhaust fan. LCO 3.0.3 is entered, since the ACTIONS do not include a Condition for more than one inoperable purge exhaust fan. The Completion Time clock for Condition A does not stop after LCO 3.0.3 is entered, but it continues to be tracked from the time Condition A was initially entered.

While in LCO 3.0.3, if one of the inoperable purge exhaust fans is restored to OPERABLE status and the Completion Time for Condition A has not expired, LCO 3.0.3 may be exited and operation may be continued in accordance with Condition A.

(continued)

EXAMPLES (continued)

While in LCO 3.0.3, if one of the inoperable purge exhaust fans is restored to OPERABLE status and the Completion Time for Condition A has expired, LCO 3.0.3 may be exited and operation may be continued in accordance with Condition B. The Completion Time for Condition B is tracked from the time that the Condition A Completion Time expired.

Upon restoring one of the purge exhaust fans to OPERABLE status, the Condition A Completion Time is not reset, but it continues from the time the first purge exhaust fan was declared inoperable.

Example 1.4-2 illustrates the use of Completion Times when entry into more than one Condition at a time within a single LCO is required.

EXAMPLE 1.4-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One level INSTRUMENT LOOP is inoperable.	A.1 Restore the inoperable level INSTRUMENT LOOP to OPERABLE status.	30 Days
B. Level is greater than the maximum limit. **OR** Both level INSTRUMENT LOOPS are inoperable.	B.1 Stop transfers into the PROCESS AREA. **AND** B.2 Verify level is less than the maximum limit using alternate instrumentation. **AND** B.3 Restore one level INSTRUMENT LOOP to OPERABLE status.	1 Hour 12 Hours **AND** Every 12 Hours thereafter 7 Days

(continued)

1.4 Completion Times (continued)

EXAMPLES (continued)

When one level INSTRUMENT LOOP is declared inoperable, Condition A is entered. If the level INSTRUMENT LOOP is not restored to OPERABLE status within 30 Days, LCO 3.0.3 is entered. The Completion Time clock for Condition A does not stop after LCO 3.0.3 is entered, but it continues to be tracked from the time Condition A was initially entered.

When a second level INSTRUMENT LOOP is declared inoperable while the first level INSTRUMENT LOOP is still inoperable, Condition A is not re-entered for the second level INSTRUMENT LOOP. In addition to remaining in Condition A, Condition B is also entered, and the Completion Time clocks start for Required Actions B.1, B.2, and B.3.

If Required Action B.3 is completed within the specified Completion Time (i.e., either of the inoperable level INSTRUMENT LOOPS is restored to OPERABLE status), Condition B is exited (assuming that level is less than the maximum limit). If the Completion Time for Required Action A.1 has not expired, operation may continue in accordance with Condition A. The remaining Completion Time in Condition A is measured from the time that the first affected level INSTRUMENT LOOP was declared inoperable (i.e., initial entry into Condition A).

Some Required Actions call for periodic performance (e.g., “Every 12 Hours thereafter”, “Every 30 Days thereafter”). The 25% extension of LCO 3.0.2 does not apply to the initial performance, but does apply to each periodic performance of these Required Actions following the initial performance.

(continued)

EXAMPLES (continued)

Example 1.4-3 illustrates transitioning between Conditions of an LCO.

EXAMPLE 1.4-3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One INSTRUMENT LOOP is inoperable.	A.1 Ensure exhaust flow is within limits. **AND** A.2 Restore the inoperable INSTRUMENT LOOP to OPERABLE status.	4 Hours **AND** Every 12 Hours thereafter 72 Hours
B. The Required Actions and/or associated Completion Times of Condition A are not met.	B.1 Stop liquid additions into the PROCESS AREA. **AND** B.2 Place the affected PROCESS AREA in STANDBY MODE.	1 Hour 7 Days

Required Action A.1 has two Completion Times. The 4-Hour Completion Time begins at the time the Condition is entered and each "Every 12 Hours thereafter" interval begins upon performance of Required Action A.1.

If after Condition A is entered, Required Action A.1 is not met within either the initial 4-Hour interval or any subsequent 12-Hour interval from the previous performance (plus the 25% extension allowed by LCO 3.0.2), Condition B is entered. The Completion Time clock for Condition A does not stop after Condition B is entered, but continues from the time Condition A is entered. If Required Action A.1 is met after Condition B is entered, Condition B may be exited and operation continued in accordance with Condition A, provided the Completion Time for Required Action A.2 has not expired.

(continued)

EXAMPLES (continued)

Example 1.4-4 illustrates alternating between equivalent recurring Required Actions.

EXAMPLE 1.4-4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The ventilation system is inoperable.	A.1 Stop WASTE TRANSFERS into the PROCESS AREA.	IMMEDIATELY
	AND	
	A.2 Stop mixing activities in the PROCESS AREA.	IMMEDIATELY
	AND	
	A.3.1 Ensure forced ventilation is operating.	7 Days **AND** Every 7 Days thereafter
	OR	
	A.3.2 Verify hydrogen concentration is less than or equal to 15% of the LFL.	7 Days **AND** Every 7 Days thereafter
	AND	
	A.4 Restore the ventilation system to OPERABLE status.	30 Days

Condition A offers a choice between Required Action A.3.1 and A.3.2. In addition to the initial 7-Day Completion Time for each of those Required Actions, the Required Actions must be repeated within subsequent 7-Day intervals (plus the 25% extension of LCO 3.0.2).

(continued)

1.4 Completion Times (continued)

EXAMPLES (continued)

After the initial performance of Required Action A.3.1 or A.3.2, either one of the two Required Actions may be subsequently performed as long as the applicable recurring Completion Time (plus the 25% extension of LCO 3.0.2) is not exceeded. This allows operational flexibility to alternate between multiple acceptable methods of demonstrating/ensuring an acceptable condition exists.

Exceptions to the ability to alternate between recurring Required Actions may be stated in individual LCOs. In those LCOs, whichever Required Action is initially performed to meet the Required Actions must be the one that is subsequently performed within the specified interval (plus the 25% extension of LCO 3.0.2).

1.5 Frequency

PURPOSE

The purpose of this section is to define the proper use and application of frequency requirements.

DESCRIPTION

Each SR has a specified frequency in which the surveillance must be met in order to meet the associated LCO. An understanding of the correct application of the specified frequency is necessary for compliance with the SR.

The specified frequency is referred to throughout this section and in the SRs of Section 4.0, "Surveillance Requirements." The specified frequency consists of the requirements of the frequency column of each SR as well as certain notes in the SR column that modify performance requirements. Situations where a surveillance could be required (i.e., its frequency could expire), but where it is not possible or not desired that it be performed until some time after the associated LCO is within its Applicability, represent potential SR 4.0.4 conflicts. To avoid these conflicts, the SR (i.e., the surveillance or the frequency) is stated such that it is only "required" when it can be and should be performed. With an SR satisfied, SR 4.0.4 imposes no restriction.

EXAMPLES

The following example illustrates the way that frequencies are specified. In this example, the LCO Applicability is GAS RELEASE and OPERATION MODES.

<u>EXAMPLE 1.5-1</u>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.x.x.x Perform an INSTRUMENT LOOP CHECK.	7 Days

(continued)

EXAMPLES (continued)

Example 1.5-1 contains the type of SR most often encountered in the TSR. The frequency specifies an interval (7 Days) during which the associated surveillance must be performed at least one time. Performance of the surveillance initiates the subsequent interval. Although the frequency is stated as 7 Days, an extension of the time interval to 1.25 times the stated frequency is allowed by SR 4.0.2 for operational flexibility. The 25% extension should be used on an “as needed” basis and should not be considered as a “normally relied on” frequency. The measurement of this surveillance interval continues at all times, even when the SR is not required to be met according to SR 4.0.1 (such as when the equipment is inoperable, a variable is outside specified limits, or the FACILITY is outside the Applicability of the LCO). If a SR is not performed within the specified interval, then SR 4.0.3 becomes applicable.

If the interval specified by SR 4.0.2 is exceeded while the FACILITY is not in a MODE or other specified condition in the Applicability of the LCO for which performance of the SR is required, the surveillance must be performed within the frequency requirements prior to entry into the MODE or other specified condition. Failure to do so would violate SR 4.0.4.

Special conditions may dictate when a surveillance is to be met. These conditions apply to the surveillance, the frequency, or both. They are “otherwise stated” conditions allowed by SR 4.0.1. They may be stated as clarifying notes in the surveillance, the frequency, or both.

(continued)

1.5 Frequency (continued)

1.5.1 Frequency Codes

SRs are an integral part of the LCO and ensure compliance with the LCO. The surveillances are performed on a frequency schedule as specified in the individual SR. The following table indicates surveillance frequencies and their specific meaning:

Notation	Frequency
10 Minutes	At least once every 10 Minutes
15 Minutes	At least once every 15 Minutes
6 Hours	At least once every 6 Hours
12 Hours	At least once every 12 Hours
24 Hours	At least once every 24 Hours
3 Days	At least once every 3 Days
7 Days	At least once every 7 Days
30 Days	At least once every 30 Days
60 Days	At least once every 60 Days
85 Days	At least once every 85 Days
90 Days	At least once every 90 Days
180 Days	At least once every 180 Days
1 Year	At least once every 365 days
18 Months	At least once every 545 days
2 Years	At least once every 730 days
5 Years	At least once every 1825 days
10 Years	At least once every 3650 days

1.6 Modes

This section defines the MODES for the applicable PROCESS AREAS in CST. The FACILITIES in CST consist of many PROCESS AREAS that perform specific, independent functions in the accomplishment of the mission of the FACILITIES. Because there are a number of PROCESS AREAS and their operations can be performed independently of other PROCESS AREAS, a separate MODE designation can apply to each of the identified PROCESS AREAS.

1.6.1 Waste Storage Tank MODES (Excluding Tank 48)

Waste storage tanks have five MODES. The hierarchy of MODES for waste storage tanks from highest to lowest is GAS RELEASE, OPERATION, CHEMICAL CLEANING (only applies to F-Area Type I waste storage tanks), MECHANICAL CLEANING (only applies to Type IV waste storage tanks), and REMOVED FROM SERVICE. The following parameters define the MODES for the waste storage tanks.

GAS RELEASE

1. Agitation of sludge, BULK SALT DISSOLUTION, and removal of interstitial liquid from saltcake is allowed in quantities that have the potential to cause the tank bulk vapor space to:
   a. Become flammable in less than 7 days for a RAPID GENERATION TANK,
   b. Become flammable in less than 28 days for a SLOW GENERATION TANK,
   c. Become flammable for a VERY SLOW GENERATION TANK, or
   d. Exceed 60% of the LFL (due to trapped gas release).
2. All activities allowed in OPERATION MODE are allowed.
3. Direct receipt of oxalic acid is prohibited.

OPERATION

1. Transfers of waste and other liquids into and out of the waste storage tank are allowed (see criteria stated below for transfers/additions involving removal of interstitial liquid from saltcake or BULK SALT DISSOLUTION). Direct receipt of oxalic acid is prohibited.
2. Storage of waste is allowed.

(continued)

OPERATION (continued)

3. Agitation of sludge, BULK SALT DISSOLUTION, and removal of interstitial liquid from saltcake are allowed, provided the sludge/saltcake is limited so that it does not have the potential to cause the tank bulk vapor space to:

   a. Become flammable in less than 7 days for a RAPID GENERATION TANK (due to trapped gas release plus radiolytic hydrogen generation),

   b. Become flammable in less than 28 days for a SLOW GENERATION TANK (due to trapped gas release plus radiolytic hydrogen generation),

   c. Become flammable for a VERY SLOW GENERATION TANK (due to trapped gas release plus radiolytic hydrogen generation), or

   d. Exceed 60% of the LFL (due to trapped gas release).

   For Tank 50, Items 3.a through 3.c shall also account for flammable vapor contributions from Isopar® L and trace organics (5% CLFL).

   The potential release quantity is determined by engineering evaluation. Agitation of sludge, BULK SALT DISSOLUTION, and removal of interstitial liquid from saltcake in quantities that have the potential to exceed the above criteria are prohibited.

   Excluding Tank 50, the requirements of the Pump Run Program or the Salt Dissolution/Interstitial Liquid Removal Program shall apply in this MODE.

   Some activities in waste tanks have the potential to release insignificant amounts of hydrogen. Examples of these activities include rotation of slurry pump turntables, sludge sampling, inserting/removing tank components below the sludge layer, air blowing transfer jets that have a suction below the sludge layer, operating transfer pumps/jets that have a suction below the sludge layer, transfers into a sludge tank, flushing of transfer pumps/jets in a sludge tank, flushing of equipment in a salt tank, sample rinsing, filling purge condenser seal legs, and transfers into a salt tank with exposed salt peaks / exposed salt on cooling coils. These, and similar types of activities, do not require an engineering evaluation.

(continued)

CHEMICAL CLEANING

-- **NOTE** --

This MODE is only applicable to F-Area Type I waste storage tanks.

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1. Storage of waste and chemical cleaning operations are allowed provided that:

   a. Inhalation dose potential of the waste is less than or equal to 1.47E+8 rem/gallon.

   b. Sludge remaining in the waste tank is less than or equal to 10,000 gallons. Sludge heel volume shall be determined by engineering evaluation.

2. Direct receipt of oxalic acid, CHEMICAL CLEANING TRANSFERS into the waste storage tank, and agitation of sludge are allowed, provided the sludge is limited so that it does not have the potential to cause the tank bulk vapor space to:

   a. Become flammable in less than 7 days for a RAPID GENERATION TANK (due to trapped gas release plus radiolytic and corrosion induced hydrogen generation),

   b. Become flammable in less than 28 days for a SLOW GENERATION TANK (due to trapped gas release plus radiolytic and corrosion induced hydrogen generation),

   c. Become flammable for a VERY SLOW GENERATION TANK (due to trapped gas release plus radiolytic and corrosion induced hydrogen generation), or

   d. Exceed 60% of the LFL (due to trapped gas release).

   The potential release quantity is determined by engineering evaluation. Direct receipt of oxalic acid, CHEMICAL CLEANING TRANSFERS, and agitation of sludge that have the potential to exceed the above criteria are prohibited.

   The requirements of the Pump Run Program shall apply in this MODE.

(continued)

CHEMICAL CLEANING (continued)

Some activities in waste tanks have the potential to release insignificant amounts of hydrogen. Examples of these activities include rotation of slurry pump turntables, sludge sampling, inserting/removing tank components below the sludge layer, air blowing transfer jets that have a suction below the sludge layer, operating transfer pumps/jets that have a suction below the sludge layer, transfers into a sludge tank, flushing of transfer pumps/jets in a sludge tank, sample rinsing, and filling purge condenser seal legs. These, and similar types of activities, do not require an engineering evaluation.

3. WASTE TRANSFERS and CHEMICAL CLEANING TRANSFERS out of the waste storage tank are allowed.

4. WASTE TRANSFERS into the waste storage tank from other waste storage tanks are prohibited. WASTE TRANSFERS and CHEMICAL CLEANING TRANSFERS from the annulus back to the primary side of the same waste storage tank are allowed.

5. Liquid additions, including receipt of oxalic acid, into the waste storage tank are allowed.

6. Operation of waste tank mixing devices is allowed.

(continued)

MECHANICAL CLEANING

-- **NOTE** --------------------------------------
This MODE is only applicable to Type IV waste storage tanks.
----

1. Storage of waste and mechanical cleaning operations are allowed provided that:

    a. Inhalation dose potential of the waste is less than or equal to 9.8E+7 rem/gallon.

    b. Total effective inhalation dose potential of the waste is less than or equal to 1.0E+11 rem.

2. The equilibrium flammable vapor concentration (including an additional 100,000-gallon vapor space reduction from the initial vapor space volume existing at the time MECHANICAL CLEANING MODE is entered) of the waste tank bulk vapor space must be less than 100% of the LFL considering only the effects of atmospheric breathing. The amount of trapped gas retained in tank solids that could potentially be released by a seismic event must not cause the peak flammable vapor concentration to reach 100% of the LFL.

3. Transfers of waste and other liquids out of the waste storage tank are allowed.

4. WASTE TRANSFERS into the waste storage tank are prohibited.

5. Air and steam to the waste tank transfer jet shall be physically isolated.

(continued)

MECHANICAL CLEANING (continued)

6. Liquid additions to the waste tank shall be from a supply tank(s) of less than or equal to 10,000 gallons total volume that do not have continuous makeup capability. Liquid additions to the waste tank shall be limited to those necessary to:

   a. Flush internal tank components (e.g., pumps, jets, crawlers, transfer lines, umbilical lines, tank walls) as part of removal, installation, and operation of the cleaning process,

   b. Maintain tank chemistry,

   c. Prevent exposed solids on the floor of the waste tank from drying to the point that they pose special airborne release concerns, and

   d. Facilitate removal of hazardous and radioactive material from the tank.

7. Direct receipt of oxalic acid is prohibited.

8. Rainwater intrusion is allowed.

9. Operation of waste tank mixing devices is prohibited. Also, pressurization sources (e.g., compressed air) to waste tank mixing devices (e.g., Advanced Design Mixing Pump [ADMP] column) shall be physically isolated.

(continued)

REMOVED FROM SERVICE

1. Storage of waste is limited to an amount having a total effective inhalation dose potential less than or equal to 1.0E+11 rem.

2. The equilibrium flammable vapor concentration (including an additional 100,000-gallon vapor space reduction from the initial vapor space volume existing at the time REMOVED FROM SERVICE MODE is entered) of the waste tank bulk vapor space must be less than 100% of the LFL considering only the effects of atmospheric breathing. The amount of trapped gas retained in tank solids that could potentially be released by a seismic event must not cause the peak flammable vapor concentration to reach 100% of the LFL.

3. WASTE TRANSFERS into and out of the tank are prohibited.

4. The following transfer line segments shall be isolated from the waste tank using blanks, plugs, cutting and capping, or providing physical separation (air gap) of the line:

   a. Transfer line segments into and out of the waste tank and annulus (except for Tanks 18 and 19).

   b. Transfer line segments for which secondary containment overflows/drains to the tank.

   c. Transfer line segments for Tanks 18 and 19 shall be isolated from the waste tank using blanks, plugs, cutting and capping, or providing physical separation (air gap) of the line except for:

      - the dedicated transfer line from Tank 19 to 18 where the motive force shall be disabled in Tank 19, and

      - the dedicated transfer line from Tank 18 to Tank 7 where the motive force shall be disabled in Tank 18

5. Air and steam to the waste tank or annulus transfer jet shall be physically isolated.

(continued)

REMOVED FROM SERVICE (continued)

6. Liquid additions to the tank shall be limited to those necessary to:

    a. Flush equipment (e.g., pumps, jets) as part of removal / installation,

    b. Maintain tank chemistry,

    c. Maintain required ballast in the tank (e.g., H-Area Type I),

    d. Prevent exposed solids on the floor of the waste tank from drying to the point that they pose special airborne release concerns, and

    e. Achieve waste immobilization for permanent closure (e.g., grouting).

7. Rainwater intrusion is allowed.

8. Operation of waste tank mixing devices is prohibited. Also, pressurization sources (e.g., compressed air) to any pump / mixer column (e.g., ADMP column) shall be physically isolated.

9. The bearing water supply to pumps in the tank and the cooling water supply and return for the tank (cooling coils and purge exhaust condenser) shall be physically isolated.

10. The MODE change to place a waste storage tank in REMOVED FROM SERVICE MODE shall be approved by the Facility Manager (or designee) and the Tank Farm Facility Operations Safety Committee (FOSC).

1.6.2 Tank 48 MODES

Tank 48 has three MODES. The hierarchy of MODES for Tank 48 from highest to lowest is OPERATION, WARM STANDBY, and COLD STANDBY. The following parameters define the MODES for Tank 48.

OPERATION — A MODE in which Tank 48 is performing its intended function including, but not limited to, storage of waste, agitation, and transfer of materials. No transfers or agitation need be in progress, but transfers and agitation may be allowed at any time.

(continued)

WARM STANDBY — A MODE in which Tank 48 is not actively in operation but is capable of operation. Storage of waste, however, is permitted in this MODE. Liquid additions allowed by Administrative Control 5.8.2.48.c can be made. Other transfers of materials are limited to those necessary to place Tank 48 in a safe condition, but are not permitted to prepare for future operations.

All maintenance activities are permitted in this MODE provided the associated activities will not violate LCO Conditions.

COLD STANDBY — A MODE in which Tank 48 is not actively in operation and is not expected to be in operation for a period of time. Storage of waste, however, is permitted in this MODE. Transfers of materials into or out of Tank 48 and agitation of waste in Tank 48 are not permitted, with the exception of those liquid additions allowed by Administrative Control 5.8.2.48.c.

All maintenance activities are permitted in this MODE provided the associated activities will not violate LCO Conditions.

1.6.3 Pump Tank MODES

Pump tanks have three MODES. The hierarchy of MODES for pump tanks from highest to lowest is OPERATION, STANDBY, and REPAIR. The following parameters define the MODES for the pump tanks.

OPERATION

1. Receipt of WASTE TRANSFERS from pumps, jets and lifts are allowed.
2. Transfers out of the pump tank using pumps or jets are allowed.
3. WASTE TRANSFERS for which the associated pump pit sump is a credited LEAK DETECTION LOCATION are allowed.
4. Operation of pump tank agitators is allowed.

STANDBY

1. Receipt of WASTE TRANSFERS from pumps, jets and lifts are restricted to RECOVERY TRANSFERS.
2. Transfers out of the pump tank using pumps or jets are allowed.
3. WASTE TRANSFERS for which the associated pump pit sump is a credited LEAK DETECTION LOCATION are allowed.
4. Operation of pump tank agitators is prohibited.

(continued)

REPAIR

1. The contents of the pump tank and the pump pit sump shall be within the limits of the REPAIR PLAN.

2. Activities in the pump tank / pump pit and activities along transfer lines for which the pump pit is a credited LEAK DETECTION LOCATION shall be within the limits of the controls stated in the REPAIR PLAN.

1.6.4 Transfer Line MODES

Transfer lines have three MODES. The hierarchy of MODES for transfer lines from highest to lowest is HIGH-REM TRANSFER, CHEMICAL CLEANING TRANSFER, and OPERATION. The following parameters define the MODES for the transfer lines.

HIGH-REM TRANSFER

1. Transfer lines are permitted to be in the TRANSFER PATH of WASTE TRANSFERS.

2. The inhalation dose potential of the transfers may be up to the maximum value analyzed in the DSA (1.5E+9 rem/gallon).

CHEMICAL CLEANING TRANSFER

-- **NOTE** --

Once a CHEMICAL CLEANING TRANSFER has occurred in a transfer line, the affected transfer line must be vented and drained prior to exiting the CHEMICAL CLEANING TRANSFER MODE. Transfer lines used for venting and draining a CHEMICAL CLEANING TRANSFER shall be in CHEMICAL CLEANING TRANSFER MODE.

----

1. Transfer lines are permitted to be in the TRANSFER PATH of WASTE TRANSFERS and CHEMICAL CLEANING TRANSFERS.

2. The inhalation dose potential of the transfers shall be less than or equal to 1.47E+8 rem/gallon.

(continued)

OPERATION

1. Transfer lines are permitted to be in the TRANSFER PATH of LOW-REM WASTE TRANSFERS.

2. The inhalation dose potential of the transfers shall be less than or equal to 2.0E+8 rem/gallon.

3. Transfer lines that credit valve boxes, drain valve boxes, or the High Point Flush Pit (HPFP) as LEAK DETECTION LOCATIONS shall be isolated from the TRANSFER PATH of a HIGH-REM WASTE TRANSFER or CHEMICAL CLEANING TRANSFER by a single leak-tested valve, double valve isolation, or blank.

1.7 Process Area Description

Certain PROCESS AREAS within the FACILITIES do not have specific LCO requirements in this TSR. However, all PROCESS AREAS within the FACILITIES are covered as appropriate by the Administrative Controls section of this TSR.

The following PROCESS AREAS do not have specific LCO requirements:

Evaporators (vessel)

242-16F (2F) Evaporator	Building 242-16F
242-16H (2H) Evaporator	Building 242-16H
242-25H (3H) Evaporator	Building 242-25H

Other PROCESS AREAS

299-H Maintenance Facility	Building 299-H
ARP Facility	Building 241-96H
MCU Facility	Building 241-278H

The following PROCESS AREAS have specific LCO requirements:

Type I Waste Storage Tanks

Tank 1	Building 241-901F
Tank 2	Building 241-902F
Tank 3	Building 241-903F
Tank 4	Building 241-904F
Tank 5	Building 241-905F
Tank 6	Building 241-906F
Tank 7	Building 241-907F
Tank 8	Building 241-908F
Tank 9	Building 241-909H
Tank 10	Building 241-910H
Tank 11	Building 241-911H
Tank 12	Building 241-912H

Type II Waste Storage Tanks

Tank 13	Building 241-913H
Tank 14	Building 241-914H
Tank 15	Building 241-915H

(continued)

Type IV Waste Storage Tanks

Tank 18	Building 241-918F
Tank 19	Building 241-919F
Tank 21	Building 241-921H
Tank 22	Building 241-922H
Tank 23	Building 241-923H
Tank 24	Building 241-924H

Type III Waste Storage Tanks

Tank 29	Building 241-929H
Tank 30	Building 241-930H
Tank 31	Building 241-931H
Tank 32	Building 241-932H
Tank 33	Building 241-933F
Tank 34	Building 241-934F

Type IIIA Waste Storage Tanks

Tank 25	Building 241-925F
Tank 26	Building 241-926F
Tank 27	Building 241-927F
Tank 28	Building 241-928F
Tank 35	Building 241-935H
Tank 36	Building 241-936H
Tank 37	Building 241-937H
Tank 38	Building 241-938H
Tank 39	Building 241-939H
Tank 40	Building 241-940H
Tank 41	Building 241-941H
Tank 42	Building 241-942H
Tank 43	Building 241-943H
Tank 44	Building 241-944F
Tank 45	Building 241-945F
Tank 46	Building 241-946F
Tank 47	Building 241-947F
Tank 48	Building 241-948H
Tank 49	Building 241-949H
Tank 50	Building 241-950H
Tank 51	Building 241-951H

(continued)

1.7 Process Area Description (continued)

Pump Tanks

F Tank Farm Pump Tank 01 (FPT-1)	Building 641-F
F Tank Farm Pump Tank 02 (FPT-2)	Building 241-21F
F Tank Farm Pump Tank 03 (FPT-3)	Building 241-21F
H Tank Farm Pump Tank 02 (HPT-2)	Building 241-35H
H Tank Farm Pump Tank 03 (HPT-3)	Building 241-35H
H Tank Farm Pump Tank 04 (HPT-4)	Building 241-35H
H Tank Farm Pump Tank 05 (HPT-5)	Building 241-70H
H Tank Farm Pump Tank 06 (HPT-6)	Building 241-70H
H Tank Farm Pump Tank 07 (HPT-7)	Building 241-100H
H Tank Farm Pump Tank 08 (HPT-8)	Building 241-100H
H Tank Farm Pump Tank 09 (HPT-9)	Building 241-100H
H Tank Farm Pump Tank 10 (HPT-10)	Building 241-100H

Transfer Lines

TRANSFER PATHS are established for the planned movement of waste through the transfer system (excluding the venting and draining of transfer lines where there is no potential to siphon waste). The TRANSFER PATH begins at the plane where the transfer line exits primary containment (e.g., the waste tank / pump tank / evaporator pot wall) or at the jet for sump transfers. The TRANSFER PATH ends at the plane where the transfer line enters primary containment (e.g., the waste tank / pump tank / evaporator pot wall). Transfers are considered to be “associated with” an affected PROCESS AREA if: a) the transfer travels through or ends within the affected PROCESS AREA, or b) the affected PROCESS AREA is considered a LEAK DETECTION LOCATION for the TRANSFER PATH.

Waste tank primary containment includes tank risers sufficiently open to the waste tank such that they do not have the potential for pluggage and overflow. The TRANSFER PATH includes piping branches up to the first sound isolation point (e.g., closed valve, blank). Transfer lines that are not Out-of-Service are assumed to maintain their primary containment function up to an acceptable waste location (e.g., waste tank, pump tank). As an example, a diversion box downstream of the first isolation point of the TRANSFER PATH is not considered a LEAK DETECTION LOCATION for the TRANSFER PATH.

It is recognized that jumpers and connectors within secondary containments (e.g., valve boxes, diversion boxes, tank risers) may experience minor leakage. As discussed in Chapter 4 of the DSA, transfer line jumpers and connectors along a TRANSFER PATH are permitted to have “drip-wise” leakage. “Drip-wise” leakage shall not be a continuous flow of material or spray. “Drip-wise” leakage is not expected to challenge the sump inventory limits presented in Chapter 3 of the DSA within a 30-day period. Line segments designated as Out-of-Service shall be isolated by a single leak-tested valve, double valve isolation, or blank (see Section 1.6 for isolation of line segments associated with waste tanks in REMOVED FROM SERVICE MODE).

Section 2

Safety Limits

2.0 SAFETY LIMITS

2.1 Safety Limits

As defined in the DOE "Implementation Guide for Use in Developing Technical Safety Requirements" (DOE G 423.1-1), Safety Limits (SLs) are limits on important process variables needed for the FACILITY function that, if exceeded, could directly cause the failure of one or more of the passive barriers that prevent the uncontrolled release of radioactive materials, with the potential of consequences to the public above specified guidelines.

The DSA did not determine any one single limit that, if exceeded, could directly cause the failure of a barrier which prevents the release of radioactive material. Therefore, CST Facilities do not require any SLs per Chapter 5 of the DSA.

As defined in the DOE "Implementation Guide for Use in Developing Technical Safety Requirements" (DOE G 423.1-1), Limiting Control Settings (LCSs) are associated with SLs and shall be conservatively selected such that automatic or manual protective action will correct the abnormal situation before an SL is exceeded. No SLs have been identified for the FACILITY; therefore, there are no LCSs.

Section 3/4

Operating Limits
and
Surveillance Requirements

3/4.0 APPLICABILITY

3.0 Limiting Conditions for Operation

LCO 3.0.1 Limiting Conditions for Operation (LCOs) shall be met for the MODES, PROCESS AREAS, or other conditions specified in the LCO Applicability, except as provided in LCO 3.0.2.

LCO 3.0.2 Upon discovery of a failure to satisfy an LCO statement, the associated Required Action(s) and associated Completion Time(s) shall be met, except as provided in LCO 3.0.6. If compliance with the associated LCO statement is restored or the LCO is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated. Conditions in an LCO's ACTIONS section may be concurrently applicable.

The Completion Time(s) for Required Action(s) are also applicable when a system or component is intentionally removed from service. Acceptable reasons for intentionally entering Required Action(s) for an LCO include, but are not limited to, performance of Surveillance Requirements (SRs), preventive maintenance, corrective maintenance, or investigation of operational problems.

For Completion Times in Required Actions that require periodic performance on a "once per … Days" or "every … Hours thereafter" basis, the specified Completion Time is met for each performance after the initial performance if the Required Action is performed within 1.25 times the interval specified. The 25% extension may be applied to any performance after the initial performance of all recurring Required Actions, unless otherwise stated in individual LCOs. (This 25% extension should not be relied upon as a routine extension of the specified Completion Time.)

(continued)

LCO 3.0.3 When an LCO statement is not met, and the associated Required Action(s) are not met or an associated Required Action is not provided, each affected PROCESS AREA shall be placed in a MODE or other specified condition in which the LCO is not applicable. Activities shall be initiated within 1 Hour to remove the affected PROCESS AREA(S) from the MODES/conditions to which the LCO is applicable. The affected PROCESS AREA(S) shall be out of the MODE(S)/conditions to which the LCO is applicable within 12 Hours. If unable to complete the required MODE/condition change within 12 Hours, an approved RESPONSE PLAN shall be developed and initiated within 24 Hours using the guidance in Administrative Control 5.4, RESPONSE PLANS, of this TSR.

Some LCOs apply in all MODES. In the event LCO 3.0.3 is entered from one of these LCOs, steps shall be initiated within 1 Hour to place the affected PROCESS AREA(S) in the MODE specified in the table below. The affected PROCESS AREA(S) shall be in the specified MODE within 12 Hours. In addition to placing the PROCESS AREA(S) in the specified MODE, an approved RESPONSE PLAN shall be developed and initiated within 24 Hours using the guidance in Administrative Control 5.4, RESPONSE PLANS, of this TSR. The affected PROCESS AREA(S) shall be controlled in accordance with the approved RESPONSE PLAN until LCO compliance is restored.

When corrective measures are completed that permit operation in accordance with the LCO or its Required Action(s), completion of the Required Action specified by LCO 3.0.3 is not required.

LCO 3.0.3 is applicable in all MODES. Exceptions to LCO 3.0.3 may be stated in the individual LCOs.

Required MODE Changes for LCO 3.0.3

PROCESS AREA	REQUIRED MODE
Waste Storage Tanks (Excluding Tank 48)	OPERATION
Tank 48	WARM STANDBY
Pump Tanks	STANDBY
Transfer Lines	OPERATION

(continued)

LCO 3.0.4 When an LCO is not met, a MODE or other specified condition in the LCO Applicability shall not be entered, except when the associated Required Action(s) to be entered permit continued operation in the MODE or other specified condition in the LCO Applicability for an unlimited period of time. LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the LCO Applicability that are required to comply with Required Action(s) or that are part of a shutdown of the PROCESS AREA.

Exceptions to LCO 3.0.4 may be stated in the individual LCOs. When an individual LCO states that LCO 3.0.4 does not apply, it allows entry into MODES or other specified conditions in the LCO Applicability when the associated Required Action(s) to be entered permit operation in the MODE or other specified condition for only a limited time.

LCO 3.0.5 Equipment removed from service or declared inoperable in order to comply with Required Action(s) may be returned to service, under administrative control, to perform testing required to demonstrate OPERABILITY of the affected equipment or associated equipment. This LCO is an exception to LCO 3.0.2 for the system or component returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

LCO 3.0.6 When a support system is inoperable and an LCO for that support system is specified in the TSR, the supported system is not required to be declared inoperable due solely to support system inoperability. Only the Required Action(s) of the support system's LCO are required to be entered. This LCO is an exception to LCO 3.0.2 for the supported system. Consideration must be given to the impact on the safety function of the supported system, and appropriate Required Action(s) must be entered when a safety function of the supported system is lost.

When a support system is inoperable and there is not an LCO for that support system specified in the TSR, the impact of the inoperability or degradation of the support system's function on the OPERABILITY of the supported system shall be evaluated. Upon determination that the supported system is inoperable, the Required Action(s) of its LCO shall apply.

3/4.0 APPLICABILITY

4.0 Surveillance Requirements

SR 4.0.1 SRs shall be met for the MODES, PROCESS AREAS, or other conditions specified in the Applicability for the individual LCOs, unless otherwise stated in an individual SR. Failure to meet an SR within the specified frequency shall constitute failure to meet the LCO, except as provided in SR 4.0.3. SRs do not have to be performed on inoperable equipment or variables outside specified limits. However, successful performance of applicable surveillances is necessary to return equipment to OPERABLE status.

SR 4.0.2 The specified frequency of each SR is met if the SR is performed within 1.25 times the interval specified in the frequency. The 25% extension allowance is not applicable to nonperiodic or conditional SRs. (This 25% extension is intended for operational flexibility both for scheduling and for performing surveillances. It should not be relied upon as a routine extension of the specified interval.)

If the periodic frequency statement for an SR contains applicability restrictions (e.g., every 24 Hours during WASTE TRANSFERS), the frequency shall be considered periodic and the 25% extension allowance may be applied. Frequency statements such as "Within 12 Hours prior to a WASTE TRANSFER", "During installation" or "Within 30 Days following…" are conditional, and therefore the 25% extension allowance is not applicable.

SR 4.0.3 Failure to perform an SR within the specified interval of SR 4.0.2, as well as any failure to meet an SR, shall constitute a failure to meet the OPERABILITY requirements of the LCO. The LCO ACTIONS shall be entered at the time it is determined that the SR has not been performed or is not met, except as provided below.

If it is discovered that an SR was not performed within the specified interval of SR 4.0.2, a delay period of 24 Hours or up to the limit of the specified frequency, whichever is less, is provided to permit completion of the SR prior to requiring the ACTIONS to be entered.

If the SR is not performed within the delay period, entry into the applicable Required Action(s) occurs IMMEDIATELY upon expiration of the delay period. When the SR is performed within the delay period and the SR is not met, entry into the applicable Required Action(s) occurs IMMEDIATELY upon failure to meet the SR. The delay period is not applicable to nonperiodic or conditional SRs unless specifically noted in the frequency. Exceptions to the delay period of SR 4.0.3 are stated in the individual SRs. Use of this delay period is a TSR violation and must be reported per Section 5.9.2.

(continued)

4.0 Surveillance Requirements (continued)

SR 4.0.4 Entry into any MODE or other specified condition in the Applicability of an LCO shall not be made unless the SRs for the applicable LCOs have been met. This provision shall not prevent passage through or to MODES as necessary to comply with Required Action(s).

Exceptions to SR 4.0.4 may be stated in the individual SRs.

3/4.1 CRITICALITY PREVENTION

Assurance that the processing of any waste in the FACILITY will not create any criticality concerns is provided by Administrative Control 5.8.2.10 and Chapter 6 of the DSA. There are no LCOs related to criticality prevention.

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.1 Tank 48 Waste Tank Nitrogen Inerting System

LCO 3.2.1: The normal nitrogen flow supplied by the Nitrogen Inerting System shall be greater than or equal to 100 scfm.

OR

Bypass nitrogen flow indication shall be greater than or equal to 10 psid.

AND

The Waste Tank Nitrogen Inerting System components stated in Table 3.2.1-1 shall be OPERABLE.

MODE APPLICABILITY: All MODES (except during NON-INERTED OPERATION)

PROCESS AREA APPLICABILITY: Tank 48

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Loss of Nitrogen Flow Interlock is inoperable or bypassed.	A.1 Stop slurry pumps. **AND** --------------- **NOTE** -------------- Liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made. --- A.2 Terminate liquid transfers into the tank. **AND** (continued on next page)	IMMEDIATELY IMMEDIATELY

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	---------------- **NOTE** -------------- The 25% extension of LCO 3.0.2 shall not be applied to the Completion Time of Required Action A.3. --	
	A.3 Perform SR 4.3.4.1.	Every 4 Hours
	AND	
	---------------- **NOTE** -------------- For Required Actions A.4 and A.5, once the verification is made within the 12-Hour Completion Time, the Required Action is satisfactorily completed and the parameters are no longer restricted by these Required Actions. --	
	A.4 Verify benzene vapor concentration is less than or equal to 50 ppm.	12 Hours
	AND	
	A.5 Verify the benzene release rate is less than or equal to 2.3 grams/minute.	12 Hours
	AND	
	A.6 Restore compliance with this Condition.	7 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Normal nitrogen flow supplied to Tank 48 is less than 100 scfm. **AND** Bypass nitrogen flow indication to Tank 48 is less than 10 psid. **OR** Nitrogen flow indicator(s) used to perform SR 4.2.1.4 is inoperable.	---------------- **NOTE** -------------- Once this Condition is entered, no action shall be taken that will create openings to the tank that would allow air inleakage. --	
	---------------- **NOTE** -------------- Interlock action should trip the exhaust fans due to low normal nitrogen supply flow to Tank 48. --	
	B.1 Trip exhaust fans and close manual exhaust dampers.	IMMEDIATELY
	AND	
	B.2 Stop slurry pumps.	IMMEDIATELY
	AND	
	---------------- **NOTE** -------------- Liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made. --	
	B.3 Terminate liquid transfers into the tank.	IMMEDIATELY
	AND	
	B.4 Close tank openings.	IMMEDIATELY
	AND	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	---------------- **NOTE** -------------- The 25% extension of LCO 3.0.2 shall not be applied to the Completion Time of Required Action B.5. ---	
	B.5 Perform SR 4.2.10.1.	Every 4 Hours
	<u>AND</u>	
	---------------- **NOTE** -------------- Do not perform Required Action B.6.1 if the capability to monitor oxygen concentration is not available. ---	
	B.6.1 Restore compliance with this Condition.	8 Hours
	<u>OR</u>	
	---------------- **NOTE** -------------- The conservation vent bypass valve may be opened immediately prior to establishing nitrogen flow to the tank. If nitrogen flow to the tank is not established, close the conservation vent bypass valve immediately, but not to exceed 20 minutes from when the valve was initially opened. ---	
	B.6.2.1 Establish a nitrogen flow rate into the tank greater than 5 scfm.	8 Hours
	<u>AND</u>	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	**---------------- NOTE --------------** The 25% extension of LCO 3.0.2 shall not be applied to the Completion Times of Required Action B.6.2.2.1. --	
	B.6.2.2.1 Verify that the oxygen concentration is less than or equal to 6.9 vol%.	8 Hours **AND** Every 30 Minutes for the Hour following the initial performance **AND** Every 2 Hours thereafter
	OR	
	B.6.2.2.2 Establish a nitrogen flow rate into the tank greater than or equal to 30 scfm.	8 Hours
	AND	
	B.6.2.3 Restore compliance with this Condition.	7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.2.1.1 Deleted	
SR 4.2.1.2 Deleted	
SR 4.2.1.3 Deleted	
SR 4.2.1.4 Verify that the nitrogen flow supplied into the tank is greater than or equal to 100 scfm from the normal nitrogen system or greater than or equal to 10 psid through the nitrogen bypass line.	12 Hours
SR 4.2.1.5 Deleted	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.2.1.6	Deleted	
SR 4.2.1.7	Deleted	
SR 4.2.1.8	Deleted	
SR 4.2.1.9	Perform an INSTRUMENT LOOP TEST on the Loss of Nitrogen Flow Interlock stated in Table 3.2.1-1.	1 Year
SR 4.2.1.10	Deleted	
SR 4.2.1.11	Deleted	
SR 4.2.1.12	Deleted	
SR 4.2.1.13	Deleted	
SR 4.2.1.14	Deleted	
SR 4.2.1.15	Deleted	
SR 4.2.1.16	Deleted	
SR 4.2.1.17	Deleted	
SR 4.2.1.18	Perform an INSTRUMENT LOOP CALIBRATION on each Normal and Bypass Nitrogen flow indicator stated in Table 3.2.1-1.	90 Days

CROSS REFERENCES

TITLE	NUMBER
Tank 48 Purge Exhaust Ventilation System	3.2.10
Tank 48 Flammable Vapor Monitoring Requirements	3.3.1
Tank 48 Oxygen Monitoring Requirements	3.3.4

Table 3.2.1-1
Tank 48 Waste Tank Nitrogen Inerting System Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tank 48	A. Two Normal Nitrogen Feed Line Flow Indicators	(1)
	B. Bypass Flow Differential Pressure Indicator	(1)
	C. Loss of Nitrogen Flow Interlock (2)	≥ 100 scfm
	i. Two Loss of Nitrogen Flow Switches (2)	≥ 100 scfm

Footnotes:

(1) Nitrogen flow to Tank 48 shall be greater than or equal to 100 scfm from the normal nitrogen system lines or greater than or equal to 10 psid through the nitrogen bypass line.
(2) The Tank 48 Loss of Nitrogen Flow Interlock (activated when both loss of nitrogen flow switches are actuated) terminates operation of both purge exhaust fans.

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.2 Tank 48 Emergency Purge Ventilation Equipment

LCO 3.2.2: The Emergency Purge Ventilation Equipment (EPVE) stated in Table 3.2.2-1 shall be OPERABLE.

MODE APPLICABILITY: All MODES (during NON-INERTED OPERATION)

PROCESS AREA APPLICABILITY: Tank 48

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required component stated in Table 3.2.2-1 is not present in the proper storage location or is inoperable.	---------------- **NOTE** -------------- Condition A does not apply while any component stated in Table 3.2.2-1 is being used to comply with an approved RESPONSE PLAN. --	
	A.1 Restore compliance with this Condition.	7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.2.2.1	Replace the portable LEL analyzer.	7 Days
SR 4.2.2.2	Deleted	
SR 4.2.2.3	Verify that each EPVE engine/blower assembly can provide an exhaust flow velocity of greater than or equal to 2991 feet per minute (fpm).	90 Days
SR 4.2.2.4	Perform a visual inspection to verify the required components stated in Table 3.2.2-1 are free from significant physical damage and are stored correctly in the EPVE storage location.	90 Days

CROSS REFERENCES

TITLE	NUMBER
Tank 48 Purge Exhaust Ventilation System	3.2.10

Table 3.2.2-1
Tank 48 Emergency Purge Ventilation Equipment Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tank 48	A. Two EPVE Engine/Blower Assemblies	N/A
	B. Downcomer	N/A
	C. Set of Flexible Ducting (three ducts)	N/A
	D. Pitot Hood	N/A
	E. Portable Lower Explosive Limit (LEL) Analyzer	N/A

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.3 Not Used

LCO 3.2.3: Not Used

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.4 Not Used

LCO 3.2.4: Not Used

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.5 Not Used

LCO 3.2.5: Not Used

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.6 Not Used

LCO 3.2.6: Not Used

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.7 Tank 48 Fill Limit and Tank Level Instrumentation

LCO 3.2.7: The Tank 48 liquid level shall be less than 248 inches as indicated by the alarm.

AND

The Tank 48 level monitoring components stated in Table 3.2.7-1 shall be OPERABLE.

MODE APPLICABILITY: All MODES

PROCESS AREA APPLICABILITY: Tank 48

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. An OPERABLE Tank 48 HLLCP is in alarm.	A.1 Terminate transfers into the tank.	IMMEDIATELY
	AND	
	A.2 Restore compliance with this Condition.	72 Hours
B. HLLCP or associated alarm is inoperable for Tank 48.	B.1 Terminate transfers into the tank.	IMMEDIATELY
	AND	
	---------------- **NOTE** -------------- On completion of Required Action B.2, transfers into the tank may resume. --	
	B.2 Provide an alternate means of detecting exceedance of the 248-inch fill limit in Tank 48.	8 Hours
	AND	
	B.3 Restore compliance with this Condition.	72 Hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.2.7.1	Verify that the liquid level in Tank 48 is less than 248 inches as indicated by the alarm.	24 Hours
SR 4.2.7.2	Perform a Continuity Check on the Tank 48 HLLCP.	7 Days

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.2.7-1
Tank 48 Fill Limit and Tank Level Required Components

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE (inches above tank bottom)**
Tank 48	A. HLLCP	< 248
	B. HLLCP Alarm	

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.8 Not Used

LCO 3.2.8: Not Used

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.9 Not Used

LCO 3.2.9: Not Used

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.10 Tank 48 Purge Exhaust Ventilation System

LCO 3.2.10: The differential pressure across the Tank 48 exhaust flow element shall be greater than or equal to 0.9 inches WC.

AND

The Tank 48 vapor space flammable vapor concentration shall be less than or equal to 20% of the CLFL.

AND

The Tank 48 Purge Exhaust Ventilation System components stated in Table 3.2.10-1 shall be OPERABLE.

MODE APPLICABILITY: All MODES

PROCESS AREA APPLICABILITY: Tank 48

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Differential pressure across the Tank 48 exhaust flow element is less than 0.9 inches WC. **<u>OR</u>** Required component stated in Table 3.2.10-1 is inoperable.	A.1 Stop slurry pumps. **<u>AND</u>** ---------------- **NOTE** -------------- Liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made. ---	IMMEDIATELY
	A.2 Terminate liquid transfers into the tank. **<u>AND</u>** ---------------- **NOTE** -------------- The 25% extension of LCO 3.0.2 shall not be applied to the Completion Time of Required Action A.3. ---	IMMEDIATELY
	A.3 Perform SR 4.2.10.1. **<u>AND</u>**	Every 4 Hours
	A.4 Restore compliance with this Condition.	7 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Tank 48 flammable vapor concentration is greater than 20% of the CLFL. **OR** An OPERABLE Tank 48 CLFL analyzer is in alarm.	B.1	Stop slurry pumps.	IMMEDIATELY
	AND		
	B.2	Terminate liquid transfers into the tank.	IMMEDIATELY
	AND		
	B.3.1	Restore compliance with this Condition.	12 Hours
		OR	
	B.3.2.1	Establish nitrogen purge ventilation with a nitrogen flow of greater than or equal to 100 scfm.	24 Hours
		AND	
	B.3.2.2	Restore the oxygen concentration to less than or equal to 6.9 vol%.	36 Hours
		AND	
	B.3.2.3	Restore compliance with this Condition.	7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.2.10.1	Verify that the concentration of flammable vapors is less than or equal to 20% of the CLFL.	24 Hours
SR 4.2.10.2	Verify that the differential pressure across the tank exhaust flow element is greater than or equal to 0.9 inches WC.	24 Hours
SR 4.2.10.3	Deleted	
SR 4.2.10.4	Perform an INSTRUMENT LOOP CALIBRATION on the Tank 48 Purge Exhaust Flow Indicator.	90 Days
SR 4.2.10.5	Verify the benzene vapor concentration is less than or equal to 50 ppm.	Within 12 Hours prior to entry into NON-INERTED OPERATION
SR 4.2.10.6	Verify the benzene release rate is less than or equal to 2.3 grams/minute with slurry pumps off.	Within 12 Hours prior to entry into NON-INERTED OPERATION
SR 4.2.10.7	Verify the slurry pumps have been tripped.	Within 12 Hours prior to entry into NON-INERTED OPERATION
SR 4.2.10.8	Deleted	
SR 4.2.10.9	Perform an INSTRUMENT LOOP CALIBRATION on the Gas Chromatograph.	Within 7 Days prior to performance of SR 4.2.10.5
SR 4.2.10.10	Verify that the required exhaust HEPA filter stated in Table 3.2.10-1 has an in-place performance test efficiency greater than or equal to 99.5%.	18 Months

CROSS REFERENCES

TITLE	NUMBER
Tank 48 Waste Tank Nitrogen Inerting System	3.2.1
Tank 48 Emergency Purge Ventilation Equipment	3.2.2
Tank 48 Flammable Vapor Monitoring Requirements	3.3.1

Table 3.2.10-1
Tank 48 Purge Exhaust Ventilation System Required Components

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tank 48	A. Purge Exhaust Flow Indicator	$\geq$ 0.9 inches WC
	B. Purge Exhaust HEPA Filter	$\geq$ 99.5%

3/4.2 TANK 48 CONFINEMENT INTEGRITY

3.2.11 Tank 48 Normal Nitrogen Supply System

LCO 3.2.11: The Liquid Nitrogen Inventory of the Normal Nitrogen Supply System shall be greater than or equal to 18,560 usable gallons.

AND

The tank level indicators stated in Table 3.2.11-1 required to ensure the liquid nitrogen inventory of the Normal Nitrogen Supply System is greater than or equal to 18,560 usable gallons shall be OPERABLE.

MODE APPLICABILITY: All MODES (except during NON-INERTED OPERATION)

PROCESS AREA APPLICABILITY: Tank 48

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Liquid nitrogen inventory of the Normal Nitrogen Supply System is less than 18,560 usable gallons. **OR** Indicator(s) on the Normal Nitrogen Supply System required to perform SR 4.2.11.1 is inoperable.	A.1 Restore compliance with this Condition.	24 Hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.2.11.1	Verify that the Normal Nitrogen Supply System liquid nitrogen inventory is greater than or equal to 18,560 usable gallons.	12 Hours
SR 4.2.11.2	Deleted	
SR 4.2.11.3	Deleted	
SR 4.2.11.4	Perform an INSTRUMENT LOOP CALIBRATION on components stated in Table 3.2.11-1.	90 Days

CROSS REFERENCES

TITLE	NUMBER
Tank 48 Waste Tank Nitrogen Inerting System	3.2.1

Table 3.2.11-1
Tank 48 Normal Nitrogen Supply System Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tank 48	A. Normal Nitrogen Supply System Tank 1 Level Indicator	N/A
	B. Normal Nitrogen Supply System Tank 2 Level Indicator	N/A
	C. Normal Nitrogen Supply System Tank 3 Level Indicator	N/A
	D. Normal Nitrogen Supply System Tank 4 Level Indicator	N/A
	E. Normal Nitrogen Supply System Tank 5 Level Indicator	N/A

3/4.3 TANK 48 INSTRUMENTATION

3.3.1 Tank 48 Flammable Vapor Monitoring Requirements

LCO 3.3.1: The Flammable Vapor Monitoring components stated in Table 3.3.1-1 shall be OPERABLE.

AND

The CLFL analyzer sample flow for Tank 48 shall be greater than or equal to 1.8 cfh and less than or equal to 2.2 cfh.

AND

The CLFL analyzer air dilution flow for Tank 48 shall be greater than or equal to 1.8 cfh and less than or equal to 2.2 cfh.

MODE APPLICABILITY: All MODES

PROCESS AREA APPLICABILITY: Tank 48

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DELETED		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required component stated in Table 3.3.1-1 is inoperable. **OR** CLFL analyzer sample flow is less than 1.8 cfh or greater than 2.2 cfh. **OR** CLFL analyzer air dilution flow is less than 1.8 cfh or greater than 2.2 cfh.	---------------- **NOTE** -------------- Liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made once alternate monitoring has been provided. ---	
	B.1 Terminate liquid transfers into the tank.	IMMEDIATELY
	AND	
	B.2 Stop slurry pumps.	30 Minutes
	AND	
	B.3.1 Restore compliance with this Condition.	8 Hours
	OR	
	B.3.2.1 Verify the flammable vapor concentration is less than or equal to 20% of the CLFL.	8 Hours **AND** Every 8 Hours thereafter
	AND	
	B.3.2.2 Restore compliance with this Condition.	7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.3.1.1	Deleted	
SR 4.3.1.2	Verify that the CLFL analyzer sample flow is greater than or equal to 1.8 cfh and less than or equal to 2.2 cfh for Tank 48.	24 Hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.3.1.3	Verify that the CLFL analyzer air dilution flow is greater than or equal to 1.8 cfh and less than or equal to 2.2 cfh for Tank 48.	24 Hours
SR 4.3.1.4	Perform an INSTRUMENT LOOP CALIBRATION on the Tank 48 CLFL Analyzer and associated alarm.	60 Days
SR 4.3.1.5	Deleted	
SR 4.3.1.6	Deleted	
SR 4.3.1.7	Deleted	
SR 4.3.1.8	Deleted	
SR 4.3.1.9	Deleted	
SR 4.3.1.10	Perform an INSTRUMENT LOOP CHECK on the Tank 48 CLFL Analyzer.	7 Days
SR 4.3.1.11	Deleted	

CROSS REFERENCES

TITLE	NUMBER
Tank 48 Waste Tank Nitrogen Inerting System	3.2.1
Tank 48 Purge Exhaust Ventilation System	3.2.10

Table 3.3.1-1
Tank 48 Flammable Vapor Monitoring Required Components

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tank 48	A. CLFL Analyzer	≤ 20% CLFL
	B. High CLFL Alarm	

3/4.3 TANK 48 INSTRUMENTATION

3.3.2 Not Used

LCO 3.3.2: Not Used

3/4.3 TANK 48 INSTRUMENTATION

3.3.3 Not Used

LCO 3.3.3: Not Used

3/4.3 TANK 48 INSTRUMENTATION

3.3.4 Tank 48 Oxygen Monitoring Requirements

LCO 3.3.4: The Oxygen Monitoring components stated in Table 3.3.4-1 shall be OPERABLE.

AND

The portable Oxygen Analyzer stated in Table 3.3.4-2 shall be available and OPERABLE.

AND

The oxygen concentration shall be less than or equal to 6.9 vol%.

MODE APPLICABILITY: All MODES (except during NON-INERTED OPERATION)

PROCESS AREA APPLICABILITY: Tank 48

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One oxygen analyzer stated in Table 3.3.4-1 is inoperable.	A.1 Restore compliance with this Condition.	7 Days
B. Both oxygen analyzers stated in Table 3.3.4-1 are inoperable.	B.1 Stop slurry pumps. **<u>AND</u>** --------------- **NOTE** ------------- Liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made. ---	IMMEDIATELY
	B.2 Terminate liquid transfers into the tank. **<u>AND</u>**	IMMEDIATELY
	B.3 Provide an alternate source of oxygen monitoring to the tank. **<u>AND</u>** --------------- **NOTE** ------------- The 25% extension of LCO 3.0.2 shall not be applied to the Completion Times of Required Action B.4. ---	IMMEDIATELY
	B.4 Perform SR 4.3.4.1. **<u>AND</u>**	IMMEDIATELY **<u>AND</u>** Every 4 Hours thereafter
	B.5 Restore compliance with this Condition.	7 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------- **NOTE** ------------- Condition C does not apply while the portable oxygen analyzer is being used to comply with LCO Required Actions B.3 of LCO 3.3.4 or B.6.2.2.1 of LCO 3.2.1. -------------------------------------		
C. Portable oxygen analyzer stated in Table 3.3.4-2 is not present in the proper storage location or is inoperable.	C.1 Restore compliance with this Condition.	7 Days
D. Oxygen concentration is greater than 6.9 vol%. **<u>OR</u>** An OPERABLE oxygen analyzer is in alarm.	D.1 Stop slurry pumps. **<u>AND</u>** D.2 Terminate liquid transfers into the tank. **<u>AND</u>** D.3 Restore compliance with this Condition.	IMMEDIATELY IMMEDIATELY IMMEDIATELY (Not to exceed 12 Hours)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.3.4.1	Verify that the oxygen concentration is less than or equal to 6.9 vol%.	24 Hours
SR 4.3.4.2	Perform an INSTRUMENT LOOP CHECK on the oxygen analyzers stated in Table 3.3.4-1.	24 Hours
SR 4.3.4.3	Replace the portable oxygen analyzer stated in Table 3.3.4-2.	7 Days
SR 4.3.4.4	Perform an INSTRUMENT LOOP CALIBRATION on the oxygen analyzers and associated alarm stated in Table 3.3.4-1.	90 Days

CROSS REFERENCES

TITLE	NUMBER
Tank 48 Waste Tank Nitrogen Inerting System	3.2.1

Table 3.3.4-1
Tank 48 Oxygen Monitoring Required Components

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tank 48	A. Two Oxygen Analyzers (each requires)	
	i. Analyzer	≤ 6.9 vol% oxygen
	ii. High Oxygen Concentration Alarm	≤ 6.9 vol% oxygen

Table 3.3.4-2
Tank 48 Portable Oxygen Monitoring Required Components

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tank 48	A. Portable Oxygen Analyzer	N/A

3/4.4 Not Used

3.4.1 Not Used

LCO 3.4.1: Not Used

3/4.5 Not Used

3.5.1 Not Used

LCO 3.5.1: Not Used

3/4.6 Not Used

3.6.1 Not Used

LCO 3.6.1: Not Used

3/4.7 TRANSFER SYSTEMS

3.7.1 Pump Pit Sumps

LCO 3.7.1: The waste level in pump pit sumps shall be less than or equal to the values stated in Table 3.7.1-2.

AND

The pump pit sump leak detection components stated in Table 3.7.1-2 shall be OPERABLE.

MODE APPLICABILITY: As stated in Table 3.7.1-1

PROCESS AREA APPLICABILITY: As stated in Table 3.7.1-1

Table 3.7.1-1
MODE / PROCESS AREA Applicability

PROCESS AREA	MODE
Pump Tanks FPT-1, FPT-2, FPT-3, HPT-2, HPT-3, HPT-4, HPT-5, HPT-6, HPT-7, HPT-8, HPT-9, HPT-10	OPERATION, STANDBY
Transfer Lines for which a pump pit stated in Table 3.7.1-2 is a credited LEAK DETECTION LOCATION	HIGH-REM TRANSFER, CHEMICAL CLEANING TRANSFER

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in a pump pit sump is greater than the value stated in Table 3.7.1-2. **<u>OR</u>** Required Action B.2 or B.3 or the associated Completion Times are not met.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. --- A.1 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected pump pit. **<u>AND</u>** A.2 Ensure that waste level in the affected pump pit sump is less than or equal to the value stated in Table 3.7.1-2.	 IMMEDIATELY 48 Hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required component stated in Table 3.7.1-2 is inoperable.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. --	
	---------------- **NOTE** -------------- Upon entry into Condition B, Required Action B.2 shall be completed. --	
	B.1 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected pump pit.	IMMEDIATELY
	AND	
	B.2 Verify waste level in the affected pump pit sump is less than or equal to the value stated in Table 3.7.1-2.	24 Hours
	AND	
	---------------- **NOTE** -------------- Upon initial completion of Required Action B.3, WASTE TRANSFERS in progress at the time Condition B was entered may be completed. --	
	B.3 Monitor liquid level in the affected pump pit sump using an alternate monitoring device with control room notification capability.	Prior to restarting a WASTE TRANSFER **AND** Every 15 minutes thereafter during the WASTE TRANSFER
	AND	
	B.4 Place the transfer line segments associated with the affected pump pit in OPERATION MODE.	14 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action A.2 and the associated Completion Time are not met.	C.1 Ensure hydrogen concentration is less than or equal to 15% of the LFL in the affected pump pit.	7 Days **AND** Every 7 Days thereafter
	OR	
	C.2 Purge the vapor space of the affected pump pit with 12 vapor space turnovers per the ERD.	7 Days **AND** Every 7 Days thereafter

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
------------------------------------ **NOTE** ------------------------------------ SR 4.7.1.1 is not required to be performed while the conductivity probe is in alarm. --		
SR 4.7.1.1	Perform an INSTRUMENT LOOP TEST on the leak detection instrumentation and alarms stated in Table 3.7.1-2.	7 Days
SR 4.7.1.2	Verify conductivity probes are set at or below the value stated in Table 3.7.1-2.	10 Years

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.1-2
Pump Pit Sump Required Components
F & H-Area Tank Farms

LEAK DETECTION LOCATION	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
FPP-1	A. Sump Conductivity Probe	≤ 22 inches
	B. Sump Conductivity Probe Control Room Alarm	
FPP-2	A. Sump Conductivity Probe	≤ 19.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
FPP-3	A. Sump Conductivity Probe	≤ 18.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-2	A. Sump Conductivity Probe	≤ 26 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-3	A. Sump Conductivity Probe	≤ 26 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-4	A. Sump Conductivity Probe	≤ 26 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-5	A. Sump Conductivity Probe	≤ 21 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-6	A. Sump Conductivity Probe	≤ 21 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-7	A. Sump Conductivity Probe	≤ 38.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-8	A. Sump Conductivity Probe	≤ 38.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-9	A. Sump Conductivity Probe	≤ 38.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
HPP-10	A. Sump Conductivity Probe	≤ 38.5 inches
	B. Sump Conductivity Probe Control Room Alarm	

3/4.7 TRANSFER SYSTEMS

3.7.2 Diversion Box Sump Level

LCO 3.7.2: The waste level in diversion boxes shall be less than or equal to the values stated in Table 3.7.2-1.

MODE APPLICABILITY: All MODES

PROCESS AREA APPLICABILITY: Transfer Lines configured to a diversion box stated in Table 3.7.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in a diversion box sump is greater than the value stated in Table 3.7.2-1.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. ---	
	A.1 Stop HIGH-REM WASTE TRANSFERS and CHEMICAL CLEANING TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected diversion box.	IMMEDIATELY
	<u>AND</u>	
	A.2 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected diversion box.	2 Hours
	<u>AND</u>	
	A.3 Ensure that waste level in the affected diversion box sump is less than or equal to the value stated in Table 3.7.2-1.	48 Hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action A.3 and the associated Completion Time are not met. **<u>OR</u>** When directed by LCO 3.7.3 Condition B.	B.1.1 Ensure hydrogen concentration is less than or equal to 15% of the LFL in the affected diversion box. **<u>OR</u>** B.1.2 Purge the vapor space of the affected diversion box with 12 vapor space turnovers per the ERD. **<u>AND</u>** B.2 Place the transfer line segments associated with the affected diversion box in OPERATION MODE.	24 Hours **<u>AND</u>** Every 24 Hours thereafter 24 Hours **<u>AND</u>** Every 24 Hours thereafter 30 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.7.2.1	Verify that the diversion box sump waste level is less than or equal to the value stated in Table 3.7.2-1.	30 Days

CROSS REFERENCES

TITLE	NUMBER
Diversion Box Leak Detection Instruments	3.7.3

Table 3.7.2-1
Diversion Box Sump Levels
F & H-Area Tank Farms

LOCATION	PARAMETER	LIMIT w/ COND. PROBE UNCERTAINTY (1)	DSA ANALYSIS VALUE (1)	REFERENCE FOR COND. PROBE HEIGHT
FDB-2	Waste level	≤ 17.5 inches	18.55 inches	Sump floor
FDB-3	Waste level	≤ 9.5 inches	10.52 inches	Sump floor
HDB-2	Waste level	≤ 5 inches	5.9 inches	Cell floor
HDB-4	Waste level	≤ 9 inches	10.27 inches	Sump floor
HDB-5	Waste level	≤ 8.5 inches	9.94 inches	Sump floor
HDB-6	Waste level	≤ 13.5 inches	14.79 inches	Sump floor
HDB-7	Waste level	≤ 19.5 inches	20.8 inches	Sump floor
HDB-8	Waste level	≤ 34.5 inches	35.96 inches	Sump floor

Footnotes:

(1) Conductivity probes are not required to be used for level measurement. The third column of the above table lists the allowed height a conductivity probe must be at or below (including margin for instrument uncertainty) in order for the instrument to be able to indicate that level is below the value in the DSA. Other methods of level measurement (e.g., visual, bubblers) may be used to meet this LCO. If other instruments / methods of level measurement are used, the DSA analysis value shall be reduced by an appropriate margin to account for uncertainties (if any) in the level measurement. The observed level must be less than or equal to the DSA Analysis Value (after adjustment for uncertainty).

3/4.7 TRANSFER SYSTEMS

3.7.3 Diversion Box Leak Detection Instruments

LCO 3.7.3: The diversion box leak detection components stated in Table 3.7.3-1 shall be OPERABLE.

MODE APPLICABILITY: HIGH-REM TRANSFER, CHEMICAL CLEANING TRANSFER

PROCESS AREA APPLICABILITY: Transfer Lines for which a diversion box sump stated in Table 3.7.3-1 is a credited LEAK DETECTION LOCATION

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required component stated in Table 3.7.3-1 is inoperable.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. ---	
	---------------- **NOTE** --------------- Upon entry into Condition A, Required Action A.2 shall be completed. ---	
	A.1 Stop HIGH-REM WASTE TRANSFERS and CHEMICAL CLEANING TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected diversion box.	IMMEDIATELY
	AND	
	A.2 Ensure that waste level in the affected diversion box sump is less than or equal to the value stated in Table 3.7.3-1.	24 Hours
	AND	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	---------------- **NOTE** -------------- Upon initial completion of Required Action A.3, WASTE TRANSFERS in progress at the time Condition A was entered may be completed. --	
	A.3 Monitor liquid level in the affected diversion box sump using an alternate monitoring device with control room notification capability.	Prior to restarting a WASTE TRANSFER **AND** Every 15 minutes thereafter during the WASTE TRANSFER
	AND	
	A.4 Place the transfer line segments associated with the affected diversion box in OPERATION MODE.	14 Days
B. Required Action A.2 or A.3 and the associated Completion Times are not met.	B.1 Enter Condition B of LCO 3.7.2.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
---------- **NOTE** ---------- SR 4.7.3.1 is not required to be performed while the conductivity probe is in alarm. ----------		
SR 4.7.3.1	Perform an INSTRUMENT LOOP TEST on the leak detection instrumentation and alarms stated in Table 3.7.3-1.	7 Days
SR 4.7.3.2	Verify conductivity probes are set at or below the value stated in Table 3.7.3-1.	10 Years

CROSS REFERENCES

TITLE	NUMBER
Diversion Box Sump Level	3.7.2

Table 3.7.3-1
Diversion Box Required Components
F & H-Area Tank Farms

LEAK DETECTION LOCATION	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE	REFERENCE FOR COND. PROBE HEIGHT
FDB-2	A. Sump Conductivity Probe	≤ 17.5 inches	Sump floor
	B. Sump Conductivity Probe Control Room Alarm		
FDB-3	A. Sump Conductivity Probe	≤ 9.5 inches	Sump floor
	B. Sump Conductivity Probe Control Room Alarm		
HDB-2	A. Sump Conductivity Probe	≤ 5 inches	Cell floor
	B. Sump Conductivity Probe Control Room Alarm		
HDB-4	A. Sump Conductivity Probe	≤ 9 inches	Sump floor
	B. Sump Conductivity Probe Control Room Alarm		
HDB-5	A. Sump Conductivity Probe	≤ 8.5 inches	Sump floor
	B. Sump Conductivity Probe Control Room Alarm		
HDB-6	A. Sump Conductivity Probe	≤ 13.5 inches	Sump floor
	B. Sump Conductivity Probe Control Room Alarm		
HDB-7	A. Sump Conductivity Probe	≤ 19.5 inches	Sump floor
	B. Sump Conductivity Probe Control Room Alarm		
HDB-8	A. Sump Conductivity Probe	≤ 34.5 inches	Sump floor
	B. Sump Conductivity Probe Control Room Alarm		

3/4.7 TRANSFER SYSTEMS

3.7.4 Valve Boxes, Drain Valve Boxes, HPFP

LCO 3.7.4: The waste level in valve boxes, drain valve boxes, and the HPFP shall be less than or equal to the values stated in Table 3.7.4-1.

AND

The valve box/drain valve box/HPFP leak detection components stated in Table 3.7.4-1 shall be OPERABLE.

MODE APPLICABILITY: HIGH-REM TRANSFER, CHEMICAL CLEANING TRANSFER

PROCESS AREA APPLICABILITY: Transfer Lines for which a valve box, drain valve box, or the HPFP stated in Table 3.7.4-1 is a credited LEAK DETECTION LOCATION

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in a LEAK DETECTION LOCATION is greater than the value stated in Table 3.7.4-1. **OR** Required Action B.2 or B.3 or the associated Completion Times are not met.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. ---	
	A.1 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION.	IMMEDIATELY
	AND	
	A.2 Ensure that waste level in the affected LEAK DETECTION LOCATION is less than or equal to the value stated in Table 3.7.4-1.	48 Hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required component stated in Table 3.7.4-1 is inoperable.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. ---	
	---------------- **NOTE** -------------- Upon entry into Condition B, Required Action B.2 shall be completed. ---	
	B.1 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION.	IMMEDIATELY
	AND	
	B.2 Verify waste level in the affected LEAK DETECTION LOCATION is less than or equal to the value stated in Table 3.7.4-1.	24 Hours
	AND	
	---------------- **NOTE** -------------- Upon initial completion of Required Action B.3, WASTE TRANSFERS in progress at the time Condition B was entered may be completed. ---	
	B.3 Monitor liquid level in the affected LEAK DETECTION LOCATION using an alternate monitoring device with control room notification capability.	Prior to restarting a WASTE TRANSFER **AND** Every 15 Minutes thereafter during the WASTE TRANSFER
	AND	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Place the transfer line segments associated with the affected LEAK DETECTION LOCATION in OPERATION MODE.	14 Days
C. Required Action A.2 and the associated Completion Time are not met.	C.1 Ensure hydrogen concentration is less than or equal to 15% of the LFL in the affected LEAK DETECTION LOCATION. **<u>OR</u>**	24 Hours **<u>AND</u>** Every 24 Hours thereafter
	C.2 Purge the vapor space of the affected LEAK DETECTION LOCATION with 12 vapor space turnovers per the ERD.	24 Hours **<u>AND</u>** Every 24 Hours thereafter

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
----------------------------------- **NOTE** ---------------------------------- SR 4.7.4.1 is not required to be performed while the conductivity probe is in alarm. --	
SR 4.7.4.1 Perform an INSTRUMENT LOOP TEST on the leak detection instrumentation and alarms stated in Table 3.7.4-1.	7 Days
SR 4.7.4.2 Verify conductivity probes are set at or below the value stated in Table 3.7.4-1.	10 Years

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.4-1
Valve Box/Drain Valve Box/HPFP Required Components
F & H-Area Tank Farms

LEAK DETECTION LOCATION	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
HPFP	A. Sump Conductivity Probe	≤ 5.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Valve Box 1	A. Sump Conductivity Probe	≤ 0.4 inches
	B. Sump Conductivity Probe Control Room Alarm	
Valve Box 2	A. Sump Conductivity Probe	≤ 0.4 inches
	B. Sump Conductivity Probe Control Room Alarm	
Valve Box 3	A. Sump Conductivity Probe	≤ 0.4 inches
	B. Sump Conductivity Probe Control Room Alarm	
Valve Box 4	A. Sump Conductivity Probe	≤ 0.4 inches
	B. Sump Conductivity Probe Control Room Alarm	
Valve Box 5	A. Sump Conductivity Probe	≤ 0.4 inches
	B. Sump Conductivity Probe Control Room Alarm	
Valve Box LDB-17	A. Sump Conductivity Probe	≤ 0.4 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 15/16 Valve Box	A. Sump Conductivity Probe	≤ 0.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 21 Valve Box	A. Sump Conductivity Probe	≤ 0.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 22 Valve Box	A. Sump Conductivity Probe	≤ 0.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 40 Valve Box	A. Sump Conductivity Probe	≤ 0.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 40 Drain Valve Box	A. Sump Conductivity Probe	≤ 0.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 42 Valve Box	A. Sump Conductivity Probe	≤ 0.75 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 49 Valve Box	A. Sump Conductivity Probe	≤ 0.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 51 Valve Box	A. Sump Conductivity Probe	≤ 0.5 inches
	B. Sump Conductivity Probe Control Room Alarm	
Tank 51 Drain Valve Box	A. Sump Conductivity Probe	≤ 0.4 inches
	B. Sump Conductivity Probe Control Room Alarm	

3/4.7 TRANSFER SYSTEMS

3.7.5 Transfer Facility Ventilation (Excluding HDB-8 Complex and HDB-7)

LCO 3.7.5: The Transfer Facility Ventilation System shall be OPERABLE.

AND

The Transfer Facility Ventilation System exhaust flow rate shall be greater than or equal to the value stated in Table 3.7.5-2.

AND

The Transfer Facility Ventilation System components stated in Table 3.7.5-2 shall be OPERABLE.

MODE APPLICABILITY: As stated in Table 3.7.5-1

PROCESS AREA APPLICABILITY: As stated in Table 3.7.5-1

Table 3.7.5-1
MODE / PROCESS AREA Applicability

PROCESS AREA	MODE
Pump Tanks FPT-1, FPT-2, FPT-3, HPT-2, HPT-3, HPT-4, HPT-5, HPT-6	OPERATION, STANDBY
Transfer Lines for which one of the following diversion boxes is a credited LEAK DETECTION LOCATION HDB-2, HDB-6	HIGH-REM TRANSFER

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Transfer Facility Ventilation System is inoperable, except as addressed by Condition B or C. **OR** Exhaust flow is less than the value stated in Table 3.7.5-2, except as addressed by Condition B. **OR** Required component stated in Table 3.7.5-2 is inoperable, except as addressed by Condition B or C. **OR** Required Action C.1 and the associated Completion Time are not met, except as addressed by Condition B.	---------------- **NOTE** -------------- Upon entry into Condition A, Required Action A.5 (i.e., A.5.1 or A.5.2) shall be completed, except for HDB-6. --- ---------------- **NOTE** -------------- Required Action A.1 is not applicable to HDB-6. ---	
	A.1 Stop additions of liquid into the affected pump tank(s) except those necessary to restore ventilation.	IMMEDIATELY
	AND	
	---------------- **NOTE** -------------- For ventilation systems that contain two 100% capacity HEPA banks, completion of Required Action A.2 is not required if entry into Condition A is due solely to SR testing required to declare a HEPA filter OPERABLE. ---	
	A.2 Stop WASTE TRANSFERS associated with the affected diversion box and pump pit(s).	IMMEDIATELY
	AND	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	---------------- **NOTE** -------------- Required Action A.3 shall not prohibit the normal air blow following jet operation. ---	
	A.3 Isolate the sump transfer jets in the affected diversion box and pump pit(s) from their steam and air supplies.	IMMEDIATELY
	<u>AND</u>	
	---------------- **NOTE** -------------- Required Actions A.4, A.5.1, and A.5.2 are not applicable to HDB-6. ---	
	A.4 Shut down agitators and other activities causing mixing in the affected pump tank(s).	IMMEDIATELY
	<u>AND</u>	
	A.5.1 Purge the vapor space of the affected transfer facility with 12 vapor space turnovers per the ERD.	14 Days **<u>AND</u>** Every 14 Days thereafter
	<u>OR</u>	
	A.5.2 Ensure hydrogen concentration is less than or equal to 15% of the LFL in the affected pump tank(s) or pump pit(s).	14 Days **<u>AND</u>** Every 14 Days thereafter
	<u>AND</u>	
	A.6 Restore compliance with this LCO.	30 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------- **NOTE** ------------ This Condition is not applicable to jetted transfers from the Canyons or from a source of less than or equal to 1200 gallons. -------------------------------------	--------------- **NOTE** ------------- Upon entry into Condition B, Required Action B.5 shall be completed. --	
B. Transfer Facility Ventilation System is inoperable during a jetted transfer to the affected pump tank. **OR** Exhaust flow to a pump tank is less than the value stated in Table 3.7.5-2 during a jetted transfer to the affected pump tank. **OR** Required component stated in Table 3.7.5-2 is inoperable during a jetted transfer to the affected pump tank, except as addressed by Condition C. **OR** Required Action C.1 and the associated Completion Time are not met during a jetted transfer to the affected pump tank.	B.1 Stop additions of liquid into the affected pump tank(s) except those necessary to restore ventilation.	IMMEDIATELY
	AND B.2 Stop WASTE TRANSFERS associated with the affected pump pit(s).	IMMEDIATELY
	AND --------------- **NOTE** ------------- Required Action B.3 shall not prohibit the normal air blow following jet operation. -- B.3 Isolate the sump transfer jets in the affected pump pit(s) from their steam and air supplies.	IMMEDIATELY
	AND B.4 Shut down agitators and other activities causing mixing in the affected pump tank(s).	IMMEDIATELY
	AND B.5 Ensure the affected pump tank has an exhaust flow greater than or equal to the value stated in Table 3.7.5-2.	Within the recovery time of Figure 3.7.5-1

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------- **NOTE** ------------- This Condition is not applicable to ventilation systems that have only one installed HEPA filter. ------------------------------------- C. Required exhaust HEPA filter is inoperable.	C.1 Place an OPERABLE exhaust HEPA filter in service.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.7.5.1	Verify exhaust flow is greater than or equal to the value stated in Table 3.7.5-2.	24 Hours **<u>AND</u>** Every 10 Minutes while an associated pump tank is receiving a transfer greater than 1200 gallons via a steam jet, excluding transfers from the canyons
SR 4.7.5.2	Perform an INSTRUMENT LOOP CALIBRATION on the flow indicators stated in Table 3.7.5-2.	1 Year
SR 4.7.5.3	Verify that the HEPA filters stated in Table 3.7.5-2 have an in-place performance test efficiency greater than or equal to 99.5%.	18 Months

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.5-2
Transfer Facility Ventilation (Excluding HDB-8 Complex and HDB-7)
Required Components
F & H-Area Tank Farms

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
FPT-1	A. Exhaust Fan	N/A
	B. Exhaust Flow Indicator	≥ 0.2 inches WC
	C. Exhaust HEPA Filter	≥ 99.5%
FPT-2 & 3	A. Exhaust Fan	N/A
	B. Exhaust Flow Indicator	≥ 0.24 inches WC (2) ≥ 0.62 inches WC (3)
	C. Exhaust HEPA Filter	≥ 99.5%
HPT-2, 3, & 4 HDB-2 (1)	A. Exhaust Fan	N/A
	B. Exhaust Flow Indicator	≥ 0.16 inches WC
	C. Exhaust HEPA Filter	≥ 99.5%
HPT-5 & 6	A. Exhaust Fan	N/A
	B. Exhaust Flow Indicator	≥ 0.5 inches WC (2) ≥ 0.9 inches WC (3)
	C. Exhaust HEPA Filter	≥ 99.5%
HDB-6 (1)	A. Exhaust Fan	N/A
	B. Exhaust Flow Indicator	≥ 0.08 inches WC
	C. Exhaust HEPA Filter	≥ 99.5%

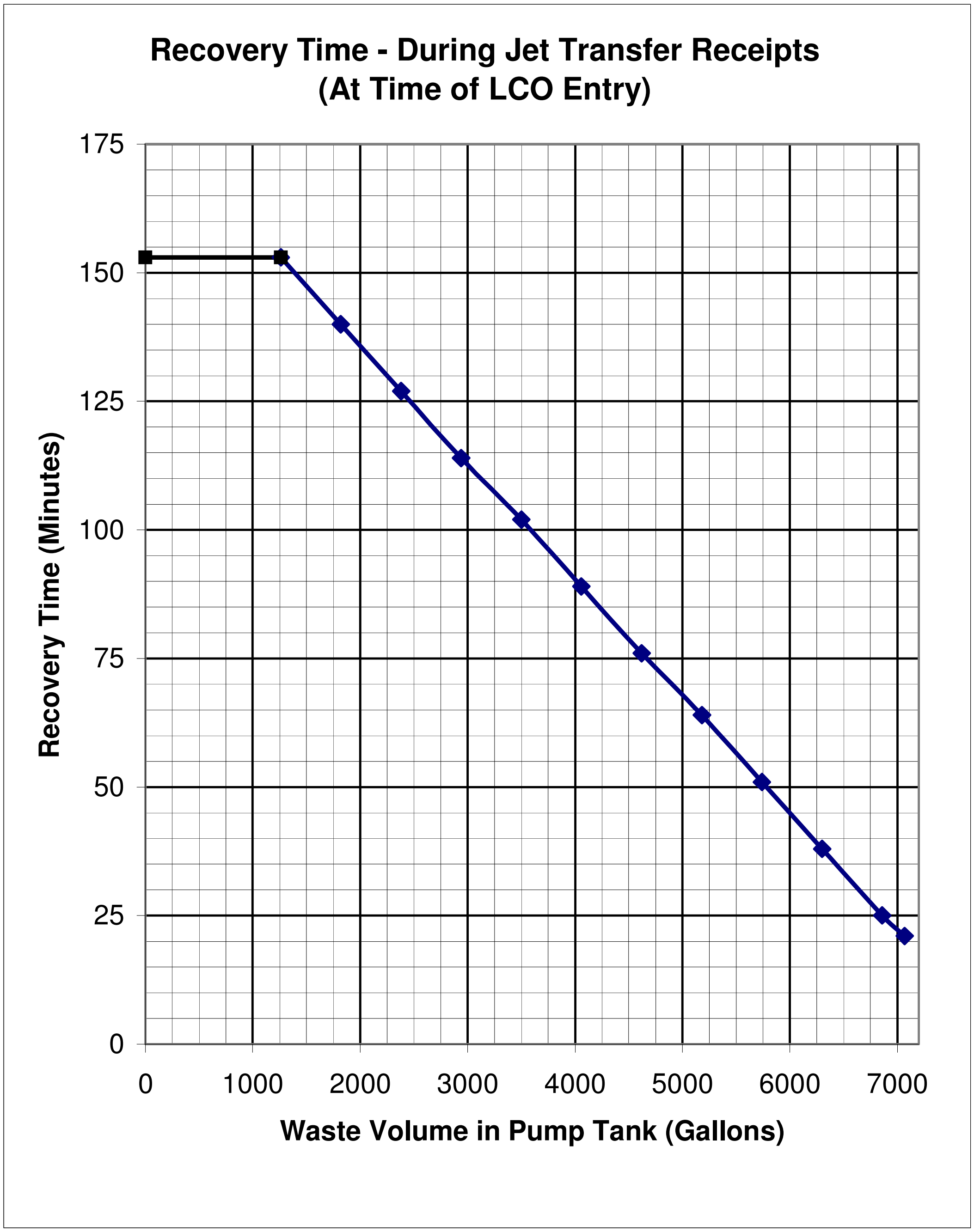
Footnotes:

(1) The PROCESS AREAS are the Transfer Lines for which the listed diversion box is a credited LEAK DETECTION LOCATION.

(2) This limit applies to pump tank exhaust flow during normal operations (excludes receipt of Canyon Process Vessel Vent flushes).

(3) This limit applies to pump tank exhaust flow during receipt of Canyon Process Vessel Vent flushes. The limit also applies following the Process Vessel Vent flush until sufficient pump tank flushes have been performed to reduce the organic contribution to LFL to less than or equal to 5%. The number of flushes required shall be determined by an engineering evaluation on a case-by-case basis.

Figure 3.7.5-1



Note: If a questionable value of volume is present, the conservative value shall be used. Decreasing the waste volume during the recovery time does not permit increasing the recovery time.

Note: Following restoration of the purge flow within its recovery time, prior to entry into another recovery time the affected vessel(s) must be either:

1) purged with sufficient volume to turn over the vapor space 12 times, or
2) sampled to show that the hydrogen concentration is less than 15% of the LFL.

3/4.7 TRANSFER SYSTEMS

3.7.6 HDB-8 Complex Process Vessel Ventilation System

LCO 3.7.6: The HDB-8 Complex Process Vessel Ventilation (PVV) System shall be OPERABLE.

AND

The HDB-8 Complex PVV System exhaust flow shall be greater than or equal to 234 scfm.

AND

The HDB-8 Complex PVV System components stated in Table 3.7.6-1 shall be OPERABLE.

MODE APPLICABILITY: OPERATION, STANDBY

PROCESS AREA APPLICABILITY: Pump Tanks HPT-7, HPT-8, HPT-9, HPT-10

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One PVV System exhaust fan is inoperable.	---------------- **NOTE** -------------- Interlock action should automatically start the standby exhaust fan due to low exhaust flow upon failure of the operating fan. ---	
	A.1 Ensure PVV System exhaust flow is greater than or equal to 234 scfm.	IMMEDIATELY
	AND	
	A.2 Restore the inoperable exhaust fan to OPERABLE status.	30 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. HDB-8 Complex PVV System is inoperable, except as addressed by Condition A, C, or D. **OR** PVV System exhaust flow is less than 234 scfm. **OR** Required Actions and the associated Completion Times of Condition A are not met. **OR** Required Action C.5 and the associated Completion Times are not met. **OR** Required Action D.1 and the associated Completion Time are not met.	B.1 Stop additions of liquid into the affected pump tank(s) except those necessary to restore ventilation.	IMMEDIATELY
	AND	
	---------------- **NOTE** -------------- Completion of Required Action B.2 is not required if entry into Condition B is due solely to SR testing required to declare a HEPA filter OPERABLE. ---	
	B.2 Stop WASTE TRANSFERS associated with the affected pump pit.	IMMEDIATELY
	AND	
	B.3 Shut down agitators and other activities causing mixing in the affected pump tank(s).	IMMEDIATELY
	AND	
	---------------- **NOTE** -------------- Required Action B.4 shall not prohibit the normal air blow following jet operation. ---	
	B.4 Isolate the sump transfer jet(s) in the affected diversion box and pump pit(s) from their steam and air supplies.	IMMEDIATELY
	AND	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.5.1 Ensure forced ventilation is operating on the affected pump tank(s).	Within the recovery time of Figure 3.7.6-1 or Figure 3.7.6-2 **AND** Every 24 Hours thereafter
	OR	
	B.5.2 Ensure hydrogen concentration is less than or equal to 15% of the LFL in the affected pump tank(s).	Within the recovery time of Figure 3.7.6-1 or Figure 3.7.6-2 **AND** Every 24 Hours thereafter
	AND	
	B.6 Restore compliance with this LCO.	30 Days
C. HDB-8 Complex PVV System exhaust flow indicator is inoperable. **OR** HDB-8 Complex PVV System exhaust flow control room alarm is inoperable. **OR** HDB-8 Complex PVV System low exhaust flow interlock is inoperable.	C.1 Stop additions of liquid into the affected pump tank(s) except those necessary to restore ventilation.	IMMEDIATELY
	AND	
	C.2 Stop WASTE TRANSFERS associated with the affected pump pit.	IMMEDIATELY
	AND	
	C.3 Shut down agitators and other activities causing mixing in the affected pump tank(s).	IMMEDIATELY
	AND	
	C.4 Ensure that a PVV System exhaust fan is operating.	IMMEDIATELY
	AND	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.5 Monitor exhaust flow using an alternate method of flow detection. **AND** C.6 Restore exhaust flow indicator / alarm / interlock to OPERABLE status.	24 Hours **AND** Every 24 Hours thereafter 30 Days
D. Required exhaust HEPA filter is inoperable.	D.1 Place an OPERABLE exhaust HEPA filter in service.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.7.6.1	Perform an INSTRUMENT LOOP CALIBRATION on the PVV System exhaust flow indicator and control room alarm stated in Table 3.7.6-1.	1 Year
SR 4.7.6.2	Perform an INSTRUMENT LOOP TEST on the PVV System low exhaust flow interlock.	1 Year
SR 4.7.6.3	Verify that the standby exhaust fan starts and the inlet dampers for the fans realign properly when directed by a simulated or actual interlock signal.	1 Year
SR 4.7.6.4	Verify that the HEPA filters stated in Table 3.7.6-1 have an in-place performance test efficiency greater than or equal to 99.5%.	18 Months

CROSS REFERENCES

TITLE	NUMBER
Standby Electrical Power	3.9.1

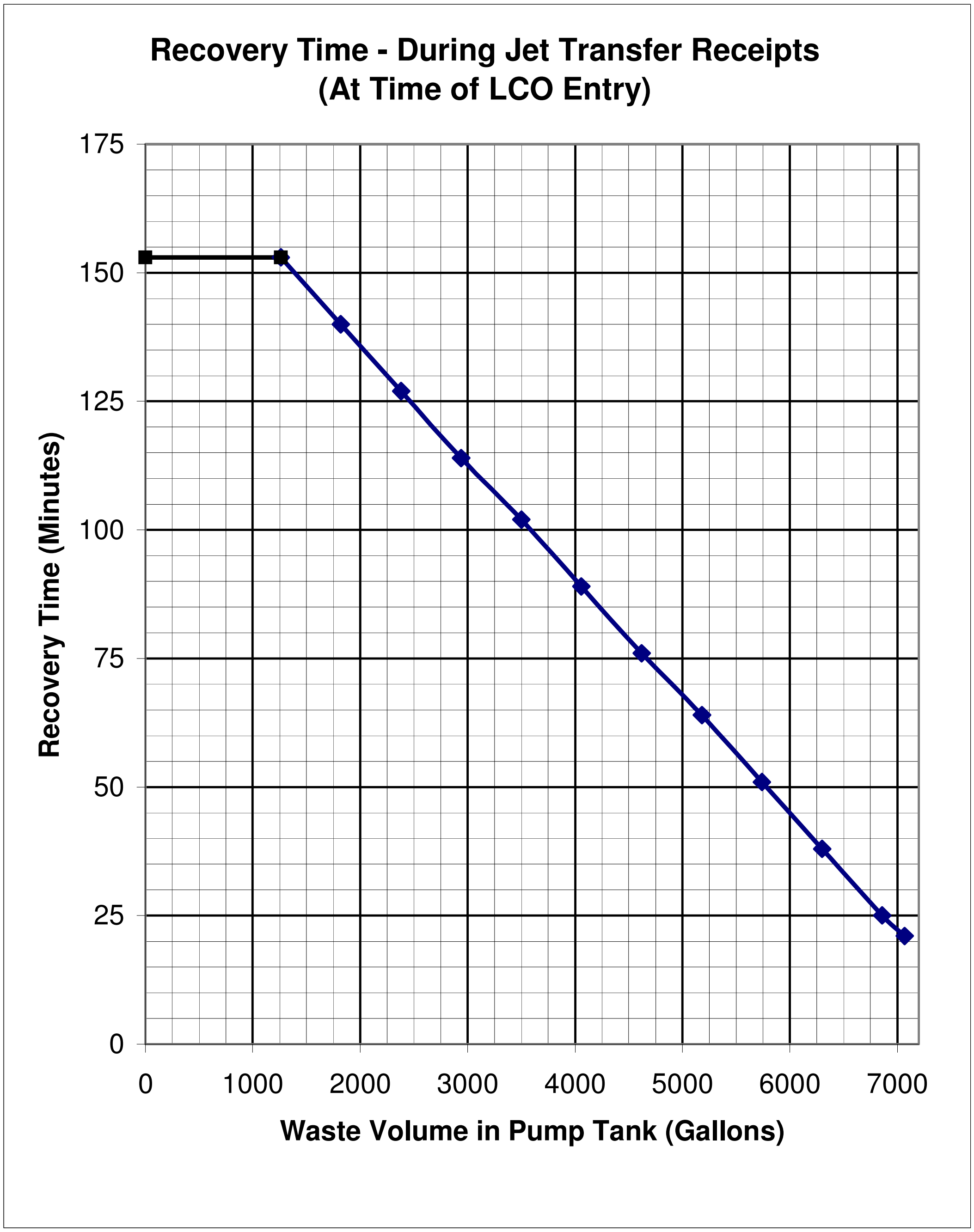
Table 3.7.6-1
HDB-8 Complex Process Vessel Ventilation System
Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Common to All HDB-8 Complex Pump Tanks	A. Two PVV System Exhaust Fans	N/A
	B. Two PVV System Fan Inlet Dampers	N/A
	C. PVV System Exhaust Flow Indicator	≥ 234 scfm
	D. PVV System Exhaust Flow Control Room Alarm	≥ 234 scfm
	E. PVV System Low Exhaust Flow Interlock (1)	≥ 234 scfm
	F. PVV System Exhaust HEPA Filter	≥ 99.5%

Footnotes:

(1) The PVV System low exhaust flow interlock shall start the standby exhaust fan and realign the inlet dampers.

Figure 3.7.6-1

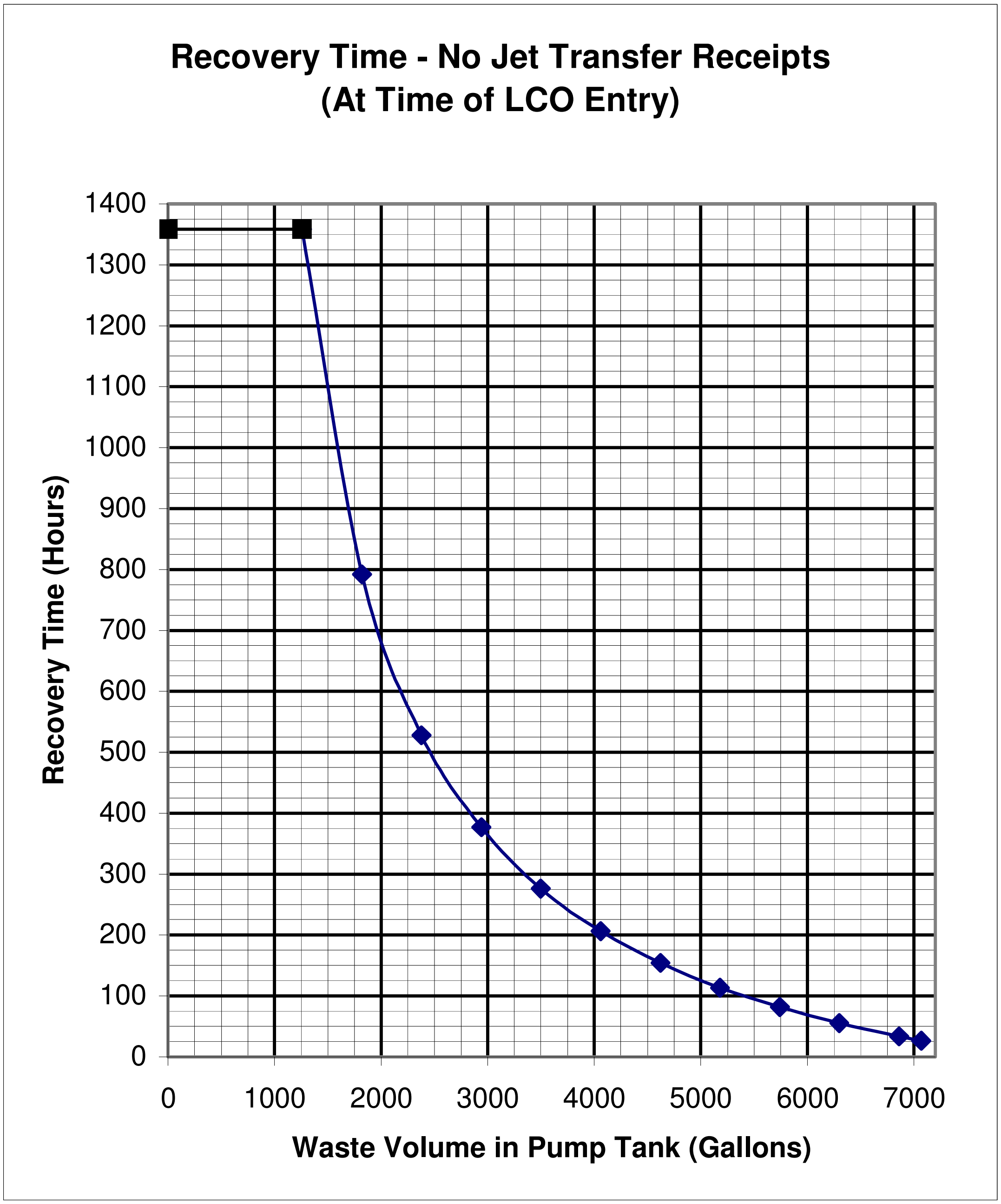


Note: If a questionable value of volume is present, the conservative value shall be used. Decreasing the waste volume during the recovery time does not permit increasing the recovery time.

Note: Following restoration of the purge flow within its recovery time, prior to entry into another recovery time the affected vessel(s) must be either:

1) purged with sufficient volume to turn over the vapor space 12 times, or
2) sampled to show that the hydrogen concentration is less than 15% of the LFL.

Figure 3.7.6-2



Note: If a questionable value of volume is present, the conservative value shall be used. Decreasing the waste volume during the recovery time does not permit increasing the recovery time.

Note: Following restoration of the purge flow within its recovery time, prior to entry into another recovery time the affected vessel(s) must be either:

1) purged with sufficient volume to turn over the vapor space 12 times, or
2) sampled to show that the hydrogen concentration is less than 15% of the LFL.

3/4.7 TRANSFER SYSTEMS

3.7.7 HDB-7 Ventilation System

LCO 3.7.7: The HDB-7 Ventilation System shall be OPERABLE.

AND

The HDB-7 Ventilation System exhaust flow rate shall be greater than or equal to the value stated in Table 3.7.7-1.

AND

The HDB-7 Ventilation System components stated in Table 3.7.7-1 shall be OPERABLE.

MODE APPLICABILITY: HIGH-REM TRANSFER,
OPERATION during ESP SLUDGE SLURRY transfers associated with HDB-7

PROCESS AREA APPLICABILITY: Transfer Lines for which HDB-7 is a credited LEAK DETECTION LOCATION

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. HDB-7 Ventilation System is inoperable. **OR** Exhaust flow is less than the value stated in Table 3.7.7-1. **OR** Required component stated in Table 3.7.7-1 is inoperable.	---------------- **NOTE** --------------- Upon entry into Condition A, Required Action A.3 (i.e., A.3.1 or A.3.2) shall be completed. ---	
	A.1 Stop WASTE TRANSFERS associated with HDB-7.	IMMEDIATELY
	AND	
	---------------- **NOTE** -------------- Required Action A.2 shall not prohibit the normal air blow following jet operation. ---	
	A.2 Isolate the transfer jet in the HDB-7 sump from its steam and air supplies.	IMMEDIATELY
	AND	
	A.3.1 Purge the HDB-7 vapor space with 12 vapor space turnovers per the ERD.	14 Days **AND** Every 14 Days thereafter
	OR	
	A.3.2 Ensure hydrogen concentration is less than or equal to 15% of the LFL in HDB-7.	14 Days **AND** Every 14 Days thereafter
	AND	
	A.4 Restore compliance with this LCO.	30 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.7.7.1	Verify exhaust flow is greater than or equal to the value stated in Table 3.7.7-1.	24 Hours
SR 4.7.7.2	Perform an INSTRUMENT LOOP CALIBRATION on the flow indicator stated in Table 3.7.7-1.	1 Year
SR 4.7.7.3	Verify that the HEPA filters stated in Table 3.7.7-1 have an in-place performance test efficiency greater than or equal to 99.5%.	18 Months

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.7-1
HDB-7 Ventilation System Required Components

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
HDB-7 (1)	A. Exhaust Fan	N/A
	B. Exhaust Flow Indicator	$\geq$ 0.175 inches WC
	C. HEPA Filter	$\geq$ 99.5%

Footnotes:

(1) The PROCESS AREAS are the Transfer Lines for which HDB-7 is a credited LEAK DETECTION LOCATION.

3/4.7 TRANSFER SYSTEMS

3.7.8 Pump Tank Pulse Tube Agitator Interlock

LCO 3.7.8: The Pump Tank Pulse Tube Agitator Interlock components stated in Table 3.7.8-1 shall be OPERABLE.

MODE APPLICABILITY: OPERATION, while a portable air compressor is connected to the FPT-1 Pulse Tube Agitator

PROCESS AREA APPLICABILITY: Pump Tank FPT-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Weight Factor Leg air flow is outside the values stated in Table 3.7.8-1.	A.1 Restore the affected air flow to within the values stated in Table 3.7.8-1.	IMMEDIATELY
OR	**OR**	
Reference Leg air flow is outside the values stated in Table 3.7.8-1.	A.2.1 Shut down the Pulse Tube Agitator.	IMMEDIATELY
	AND	
	A.2.2 Disconnect the portable air compressor from the FPT-1 Pulse Tube Agitator.	24 Hours
B. Required component stated in Table 3.7.8-1 is inoperable, except as addressed by Condition A.	B.1 Shut down the Pulse Tube Agitator.	IMMEDIATELY
	AND	
	B.2 Disconnect the portable air compressor from the FPT-1 Pulse Tube Agitator.	24 Hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.7.8.1	Verify instrument air flow through the pump tank level instrument flow indicators (weight factor and reference legs) is within the values stated in Table 3.7.8-1.	24 Hours
SR 4.7.8.2	Perform an INSTRUMENT LOOP CHECK on pump tank level instrument.	24 Hours
SR 4.7.8.3	Perform an INSTRUMENT LOOP TEST on the pump tank low level interlock.	90 Days
SR 4.7.8.4	Verify that the Pulse Tube Agitator Main Air Flow Valve closes when directed by a simulated or actual interlock signal (see Table 3.7.8-1).	90 Days
SR 4.7.8.5	Perform an INSTRUMENT LOOP CHECK on the weight factor and reference leg air flow indicators stated in Table 3.7.8-1.	180 Days
SR 4.7.8.6	Perform an INSTRUMENT LOOP CALIBRATION on the pump tank level instrument stated in Table 3.7.8-1.	1 Year

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.8-1
Pump Tank Pulse Tube Agitator Interlock Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
FPT-1	A. Pump Tank Level Instrument (weight factor)	
	i. Weight Factor Leg Dip Tube Air Flow Indicator	$\geq$ 1.5 scfh $\leq$ 2.5 scfh
	ii Reference Leg Dip Tube Air Flow Indicator	$\geq$ 1.5 scfh $\leq$ 2.5 scfh
	iii. Level Transmitter	N/A
	B. Pump Tank Low Level Interlock (1)	$\geq$ 22 inches WC
	C. Interlocked Pulse Tube Agitator Main Air Flow Valve	N/A

Footnotes:

(1) The pump tank low level interlock shall close the Pulse Tube Agitator Main Air Flow Valve.

3/4.7 TRANSFER SYSTEMS

3.7.9 Area Radiation Monitoring – Above-Ground Transfer Lines

LCO 3.7.9: The hardwired, portable, and/or wireless Area Radiation Monitors (ARMs) identified in accordance with the ARM Location Program as required to provide coverage for above-ground transfer lines shall be OPERABLE.

AND

Radiation levels at the ARMs shall be less than or equal to the SETPOINTS of the instruments.

MODE APPLICABILITY: HIGH-REM TRANSFER

PROCESS AREA APPLICABILITY: Above-Ground Transfer Lines

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ARM is inoperable. **OR** Radiation level at the ARM is greater than the SETPOINT of the instrument.	---------------- **NOTE** ---------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. -- A.1 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, through above-ground lines associated with the ARM location(s).	IMMEDIATELY
	AND A.2 Place the affected transfer line segments in OPERATION MODE.	14 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.7.9.1	Verify the alarm status of portable ARMs (without control room alarms).	15 Minutes
---------- **NOTE** ---------- SR 4.7.9.2 is not required to be performed while the ARM is in alarm. --		
SR 4.7.9.2	Verify that the indicated radiation levels on the hardwired (with control room alarms) or portable ARMs (without control room alarms) are within the range of the meter.	24 Hours
---------- **NOTE** ---------- SR 4.7.9.3 is not required to be performed while the ARM is in alarm. -- ---------- **NOTE** ---------- Alarm received during performance of SR 4.7.9.3 does not require entry into Condition A. --		
SR 4.7.9.3	Perform an INSTRUMENT LOOP TEST on the wireless ARMs (with control room alarm).	24 Hours
---------- **NOTE** ---------- SR 4.7.9.4 is not required to be performed while the ARM is in alarm. --		
SR 4.7.9.4	Perform a SOURCE CHECK on the ARMs.	90 Days
SR 4.7.9.5	Perform an INSTRUMENT LOOP CALIBRATION on the ARMs.	1 Year

CROSS REFERENCES

TITLE	NUMBER
Area Radiation Monitoring – Waste Storage Tanks	3.8.11

3/4.7 TRANSFER SYSTEMS

3.7.10 LDB, MLDB, LPS, Tank Risers

LCO 3.7.10: The waste level in Leak Detection Boxes (LDBs), Modified Leak Detection Boxes (MLDBs), Leak Probe Sleeves (LPSs), and Tank Risers shall be less than or equal to the values stated in Table 3.7.10-1.

AND

The Transfer System leak detection components stated in Table 3.7.10-1 shall be OPERABLE.

MODE APPLICABILITY: HIGH-REM TRANSFER

PROCESS AREA APPLICABILITY: Transfer Lines for which a LDB, MLDB, LPS, or Tank Riser stated in Table 3.7.10-1 is a credited LEAK DETECTION LOCATION

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in a LEAK DETECTION LOCATION is greater than the value stated in Table 3.7.10-1. **OR** Required Action B.2 or the associated Completion Times are not met.	--------------- **NOTE** --------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. --	
	A.1 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION.	IMMEDIATELY
	AND	
	A.2 Ensure that waste level in the affected LEAK DETECTION LOCATION is less than or equal to the value stated in Table 3.7.10-1.	Prior to restarting a WASTE TRANSFER

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required component stated in Table 3.7.10-1 is inoperable.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. --	
	B.1 Stop WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION.	IMMEDIATELY
	<u>AND</u>	
	---------------- **NOTE** -------------- Upon initial completion of Required Action B.2, WASTE TRANSFERS in progress at the time Condition B was entered may be completed. --	
	B.2 Verify waste level in the affected LEAK DETECTION LOCATION is less than or equal to the value stated in Table 3.7.10-1 using an alternate monitoring device with control room notification capability.	Prior to restarting a WASTE TRANSFER **<u>AND</u>** Every 15 minutes thereafter during the WASTE TRANSFER
	<u>AND</u>	
	B.3 Place the transfer line segments associated with the affected LEAK DETECTION LOCATION in OPERATION MODE.	14 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
----------------------------------- **NOTE** ---------------------------------- SR 4.7.10.1 is not required to be performed while the conductivity probe is in alarm. ---		
SR 4.7.10.1	Perform an INSTRUMENT LOOP TEST on the leak detection instrumentation and alarms stated in Table 3.7.10-1.	7 Days
SR 4.7.10.2	Verify conductivity probes are set at or below the value stated in Table 3.7.10-1.	10 Years

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.10-1
LDB/MLDB/LPS/Tank Riser Required Components
H-Area Tank Farm

LEAK DETECTION LOCATION	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
LDB (1)	A. Conductivity Probe	≤ 2 inches from floor of LDB
	B. Conductivity Probe Control Room Alarm	
MLDB	A. Conductivity Probe	At or below the bottom of the conductivity probe conduit
	B. Conductivity Probe Control Room Alarm	
LPS	A. Conductivity Probe	At or below the bottom of the conductivity probe conduit
	B. Conductivity Probe Control Room Alarm	
Tank Jet/Pump Riser that has potential for pluggage	A. Conductivity Probe	At or below the bottom of the conductivity probe conduit
	B. Conductivity Probe Control Room Alarm	

Footnotes:

(1) LDBs at the HDB-8 Complex are not credited LEAK DETECTION LOCATIONS.

3/4.7 TRANSFER SYSTEMS

3.7.11 LDB Drain Cell

LCO 3.7.11: The waste level in the LDB Drain Cell shall be less than or equal to the value stated in Table 3.7.11-1.

MODE APPLICABILITY: All MODES

PROCESS AREA APPLICABILITY: Transfer Lines for which the credited LEAK DETECTION LOCATIONS (e.g., LDBs) are connected to the LDB Drain Cell

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in the LDB Drain Cell is greater than the value stated in Table 3.7.11-1.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. -- A.1 Ensure that waste level in the LDB Drain Cell is less than or equal to the value stated in Table 3.7.11-1.	48 Hours
B. Required Action A.1 and the associated Completion Time are not met.	B.1.1 Ensure hydrogen concentration is less than or equal to 15% of the LFL in the LDB Drain Cell. **<u>OR</u>** B.1.2 Purge the vapor space of the LDB Drain Cell with 12 vapor space turnovers per the ERD. **<u>AND</u>** B.2 Place the transfer line segments associated with the LDB Drain Cell in OPERATION MODE.	24 Hours **<u>AND</u>** Every 24 Hours thereafter 24 Hours **<u>AND</u>** Every 24 Hours thereafter 30 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.7.11.1 Verify that the LDB Drain Cell waste level is less than or equal to the value stated in Table 3.7.11-1.	30 Days

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.11-1
LDB Drain Cell Sump Level
H-Area Tank Farm

LOCATION	PARAMETER	LIMIT w/ COND. PROBE UNCERTAINTY (1)	DSA ANALYSIS VALUE (1)	REFERENCE FOR COND. PROBE HEIGHT
LDB Drain Cell	Waste level	≤ 11 inches	12.56 inches	Sump floor

Footnotes:

(1) Conductivity probes are not required to be used for level measurement. The third column of the above table lists the allowed height a conductivity probe must be at or below (including margin for instrument uncertainty) in order for the instrument to be able to indicate that level is below the value in the DSA. Other methods of level measurement (e.g., visual, bubblers) may be used to meet this LCO. If other instruments / methods of level measurement are used, the DSA analysis value shall be reduced by an appropriate margin to account for uncertainties (if any) in the level measurement. The observed level must be less than or equal to the DSA Analysis Value (after adjustment for uncertainty).

3/4.7 TRANSFER SYSTEMS

3.7.12 242-16H and 242-16F Evaporator Cell Sump Level

LCO 3.7.12: The waste level in the evaporator cell sump shall be less than or equal to the value stated in Table 3.7.12-1.

----------------------------------- **NOTE** -----------------------------------
Level in the evaporator cell sump may be intentionally increased above the limit stated in Table 3.7.12-1 for ≤ 7 days under administrative control. The volume of additional waste entering the cell sump under these administrative controls shall be limited to 300 gallons. The volume of liquid added to the cell sump under these administrative controls shall not increase the sump/cell liquid volume to greater than 5000 gallons.

MODE APPLICABILITY: OPERATION

PROCESS AREA APPLICABILITY: Transfer Lines (jumpers and associated nozzles) in the 242-16H or 242-16F Evaporator Cell configured for liquid transfers through the cell that bypass the evaporator pot

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in the evaporator cell sump is greater than the value stated in Table 3.7.12-1.	A.1 Stop liquid transfers through the affected evaporator cell that bypass the evaporator pot.	2 Hours
	AND	
	A.2 Ensure that waste level in the affected evaporator cell sump is less than or equal to the value stated in Table 3.7.12-1.	48 Hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action A.2 and the associated Completion Time are not met.	B.1 Ensure hydrogen concentration is less than or equal to 15% of the LFL in the affected evaporator cell. **OR** B.2 Purge the vapor space of the affected evaporator cell with 12 vapor space turnovers per the ERD.	7 Days **AND** Every 7 Days thereafter 7 Days **AND** Every 7 Days thereafter

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.7.12.1 Verify that the evaporator cell sump waste level is less than or equal to the value stated in Table 3.7.12-1.	30 Days

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.12-1
242-16H and 242-16F Evaporator Cell Sump Levels
F & H-Area Tank Farms

LEAK DETECTION LOCATION	PARAMETER	LIMIT w/ COND. PROBE UNCERTAINTY (1)	DSA ANALYSIS VALUE (1)	REFERENCE FOR COND. PROBE HEIGHT
242-16F Evaporator cell sump	Waste level	≤ 32 inches	33.44 inches	Sump floor
242-16H Evaporator cell sump	Waste level	≤ 32 inches	33.44 inches	Sump floor

Footnotes:

(1) Conductivity probes are not required to be used for level measurement. The third column of the above table lists the allowed height a conductivity probe must be at or below (including margin for instrument uncertainty) in order for the instrument to be able to indicate that level is below the value in the DSA. Other methods of level measurement (e.g., visual, bubblers) may be used to meet this LCO. If other instruments / methods of level measurement are used, the DSA analysis value shall be reduced by an appropriate margin to account for uncertainties (if any) in the level measurement. The observed level must be less than or equal to the DSA Analysis Value (after adjustment for uncertainty).

3/4.7 TRANSFER SYSTEMS

3.7.13 242-16F and 242-16H Evaporator Feed Pump Backflow Prevention Devices

LCO 3.7.13: The backflow prevention devices stated in Table 3.7.13-1 shall be OPERABLE.

MODE APPLICABILITY: OPERATION

PROCESS AREA APPLICABILITY: Feed Pump Transfer Lines for the 242-16F or 242-16H Evaporator during Evaporator Feed Pump priming or Feed Pump operation

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required backflow prevention device is inoperable.	--------------- **NOTE** --------------- Required Action A.1 shall not prohibit the normal flush following Evaporator Feed Pump operation. ---	
	A.1 Stop Evaporator Feed Pump operation associated with the affected evaporator.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.7.13.1	Verify that each of the backflow prevention devices stated in Table 3.7.13-1 have a leak rate less than or equal to 1 gpm.	2 Years

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.7.13-1
242-16F and 242-16H Evaporator
Feed Pump Backflow Prevention Device Required Components
F & H-Area Tank Farms

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
242-16F Evaporator Feed Pump Transfer Lines	A. Two Evaporator Feed Pump Backflow Prevention Devices	≤ 1 gpm (1)
242-16H Evaporator Feed Pump Transfer Lines	A. Two Evaporator Feed Pump Backflow Prevention Devices	≤ 1 gpm (1)

Footnotes:

(1) Each backflow prevention device leak rate shall be less than or equal to 1 gpm.

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.1 Waste Tank Purge Ventilation System

LCO 3.8.1: The Waste Tank Purge Ventilation System shall be OPERABLE.

AND

The exhaust flow indicator reading on RAPID GENERATION TANKS shall be greater than or equal to the value stated in Tables 3.8.1-2 and 3.8.1-3.

AND

The flow indicators stated in Tables 3.8.1-2 and 3.8.1-3 shall be OPERABLE on RAPID GENERATION TANKS.

MODE APPLICABILITY: As stated in Table 3.8.1-1

PROCESS AREA APPLICABILITY: As stated in Table 3.8.1-1

Table 3.8.1-1
MODE / PROCESS AREA Applicability

PROCESS AREA	MODE
RAPID GENERATION TANKS (1)	OPERATION, CHEMICAL CLEANING
SLOW GENERATION TANKS (1)	OPERATION, CHEMICAL CLEANING
VERY SLOW GENERATION TANKS (1)	OPERATION, CHEMICAL CLEANING while waste tank mixing devices are operating OPERATION, CHEMICAL CLEANING while steam/air is supplied to the tank's transfer jet MECHANICAL CLEANING while crawler lancing devices from pressure sources > 10,000 psi are operating

Footnotes:

(1) See the ERD for current classification of individual tanks.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
-------------- **NOTE** ------------ If this Condition is entered when OPERATION MODE is entered from GAS RELEASE MODE, the Completion Times for the Required Actions of this Condition shall start at the time the condition was initially discovered. --------------------------------------	-------------- **NOTE** --------------- LCO 3.0.4 is not applicable to changes in tank flammability classification. --	
A. RAPID GENERATION TANK Purge Ventilation System is inoperable, except as addressed by Condition D or E. **<u>OR</u>** Exhaust flow on a RAPID GENERATION TANK is less than the value stated in Table 3.8.1-2 or 3.8.1-3. **<u>OR</u>** Required exhaust flow indicator on a RAPID GENERATION TANK is inoperable. **<u>OR</u>** Required Action D.1 or E.1.1 or the associated Completion Time are not met on a RAPID GENERATION TANK.	-------------- **NOTE** --------------- For ventilation systems that contain two 100% capacity HEPA banks, completion of Required Actions A.1 and A.2 are not required if entry into Condition A is due solely to SR testing required to declare a HEPA filter OPERABLE. -- -------------- **NOTE** --------------- Required Action A.1 shall not prevent liquid additions necessary to place the tank in a safe condition. --	
	A.1 Stop liquid additions, except for CONTINGENCY TRANSFERS, into the affected tank.	IMMEDIATELY
	<u>AND</u>	
	A.2 Stop WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected tank.	IMMEDIATELY
	<u>AND</u>	
	A.3 Stop waste tank mixing devices in the affected tank.	IMMEDIATELY
	<u>AND</u>	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	--------------- **NOTE** --------------- Required Action A.4 shall not prohibit the normal air blow following jet operation. ---	
	A.4 Isolate the transfer jet in the affected tank from its steam and air supplies.	IMMEDIATELY
	<u>AND</u>	
	A.5.1 Ensure forced ventilation is operating on the affected tank.	4 Days **<u>AND</u>** Every 24 Hours thereafter
	<u>OR</u>	
	--------------- **NOTE** --------------- Required Action A.5.2 is not applicable to Tank 50. ---	
	A.5.2 Verify hydrogen concentration is less than or equal to the LFL limit stated in the ERD in the affected tank.	4 Days **<u>AND</u>** Every 24 Hours thereafter
	<u>AND</u>	
	A.6 Restore the tank ventilation system to OPERABLE status with an exhaust flow greater than or equal to the value stated in Table 3.8.1-2 or 3.8.1-3.	30 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
-------------- **NOTE** -------------- If this Condition is entered when OPERATION MODE is entered from GAS RELEASE MODE, the Completion Times for the Required Actions of this Condition shall start at the time the condition was initially discovered. ---------------------------------------	--------------- **NOTE** --------------- LCO 3.0.4 is not applicable to changes in tank flammability classification. ---	
B. SLOW GENERATION TANK Purge Ventilation System is inoperable, except as addressed by Condition D or E. **<u>OR</u>** Required Action D.1 or E.1.2 or the associated Completion Time are not met on a SLOW GENERATION TANK.	--------------- **NOTE** --------------- For ventilation systems that contain two 100% capacity HEPA banks, completion of Required Actions B.1 and B.2 are not required if entry into Condition B is due solely to SR testing required to declare a HEPA filter OPERABLE. ---	
	--------------- **NOTE** --------------- Required Action B.1 shall not prevent liquid additions necessary to place the tank in a safe condition. ---	
	B.1 Stop liquid additions, except for CONTINGENCY TRANSFERS, into the affected tank.	IMMEDIATELY
	<u>AND</u>	
	B.2 Stop WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected tank.	IMMEDIATELY
	<u>AND</u>	
	B.3 Stop waste tank mixing devices in the affected tank.	IMMEDIATELY
	<u>AND</u>	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	--------------- **NOTE** --------------- Required Action B.4 shall not prohibit the normal air blow following jet operation. ---	
	B.4 Isolate the transfer jet in the affected tank from its steam and air supplies.	IMMEDIATELY
	AND	
	B.5 Ensure forced ventilation is operating on the affected tank.	21 Days **AND** Every 7 Days thereafter
	AND	
	B.6 Restore the tank ventilation system to OPERABLE status.	90 Days
C. VERY SLOW GENERATION TANK Purge Ventilation System is inoperable, except as addressed by Condition D or E. **OR** Required Action D.1 or E.1.2 or the associated Completion Time are not met on a VERY SLOW GENERATION TANK.	C.1 Stop waste tank mixing devices in the affected tank.	IMMEDIATELY
	AND	
	--------------- **NOTE** --------------- Required Action C.2 shall not prohibit the normal air blow following jet operation. ---	
	C.2 Isolate the transfer jet in the affected tank from its steam and air supplies.	IMMEDIATELY
	AND	
	C.3 Stop crawler lancing device operations in the affected tank.	IMMEDIATELY

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------- **NOTE** ------------- This Condition is not applicable to ventilation systems that have only one installed HEPA filter or that require both HEPA filters. ------------------------------------- D. Required exhaust HEPA filter is inoperable.	D.1 Place an OPERABLE exhaust HEPA filter in service.	IMMEDIATELY
------------- **NOTE** ------------- For cumulative hole size greater than 0.55 square inches, enter Condition A, B, or C as appropriate. ------------------------------------- E. Purge Ventilation System ductwork has hole(s) with a cumulative area less than or equal to 0.55 square inches located upstream of the purge exhaust fan.	-------------- **NOTE** -------------- LCO 3.0.4 is not applicable to changes in tank flammability classification or changes in applicability for VERY SLOW GENERATION TANKS stated in Table 3.8.1-1. -- -------------- **NOTE** -------------- Required Action E.1.1 is for RAPID GENERATION TANKS. -- E.1.1 Verify exhaust flow for affected tank is greater than or equal to the value stated in Table 3.8.1-4 or 3.8.1-5. **<u>OR</u>** -------------- **NOTE** -------------- Required Action E.1.2 is for SLOW GENERATION TANKS and VERY SLOW GENERATION TANKS. -- E.1.2 Verify exhaust fan operating and aligned to affected tank. **<u>AND</u>** E.2 Restore the tank ventilation ductwork structural integrity.	 12 Hours **<u>AND</u>** Every 12 Hours thereafter 12 Hours **<u>AND</u>** Every 12 Hours thereafter 90 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action A.5.2 or the associated Completion Times are not met.	F.1 Enter Condition A of LCO 3.8.2.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.1.1	Verify the exhaust flow indicator reading on RAPID GENERATION TANKS is greater than or equal to the value stated in Tables 3.8.1-2 and 3.8.1-3.	24 Hours
SR 4.8.1.2	Verify the exhaust fan is operating and aligned to the waste tank on SLOW GENERATION TANKS and VERY SLOW GENERATION TANKS.	24 Hours
SR 4.8.1.3	Verify the exhaust fan has a capacity greater than or equal to 45 scfm on SLOW GENERATION TANKS.	2 Years
SR 4.8.1.4	Perform an INSTRUMENT LOOP CALIBRATION on the exhaust flow indicator on RAPID GENERATION TANKS.	1 Year
SR 4.8.1.5	Verify that the HEPA filters stated in Tables 3.8.1-2 and 3.8.1-3 have an in-place performance test efficiency greater than or equal to 99.5%.	18 Months

CROSS REFERENCES

TITLE	NUMBER
Hydrogen Monitoring – RAPID GENERATION TANKS	3.8.2
Waste Tank Purge Ventilation System – GAS RELEASE	3.8.9
Waste Tank Purge Portable Ventilation Equipment	3.8.13

Table 3.8.1-2
Waste Tank Purge Ventilation System
Required Components
F-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tanks 1, 2, 3, 4, 5, 6, 8, 18, 25, 28	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	$\geq$ 0.1 inches WC
	iii. Exhaust HEPA Filter	$\geq$ 99.5%
Tank 7	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	$\geq$ 0.18 inches WC
	iii. Exhaust HEPA Filter	$\geq$ 99.5%
Tank 19	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	$\geq$ 0.04 inches WC
	iii. Both Exhaust HEPA Filters	$\geq$ 99.5%
Tanks 26, 27, 44, 45, 46, 47	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	$\geq$ 0.24 inches WC
	iii. Exhaust HEPA Filter	$\geq$ 99.5%
Tanks 33, 34	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	$\geq$ 0.06 inches WC
	iii. Exhaust HEPA Filter	$\geq$ 99.5%

Footnotes:

(1) The flow indication requirements of this LCO only apply to a waste storage tank when it is classified as a RAPID GENERATION TANK, except as addressed by Condition E.

Table 3.8.1-3 (Sheet 1 of 2)
Waste Tank Purge Ventilation System
Required Components
H-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tanks 9, 10, 11, 12, 14, 15, 22, 23, 24, 41	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	≥ 0.1 inches WC
	iii. Exhaust HEPA Filter	≥ 99.5%
Tanks 13, 30, 32	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	≥ 0.2 inches WC
	iii. Exhaust HEPA Filter	≥ 99.5%
Tank 21	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	≥ 0.1 inches WC
	iii. Both Exhaust HEPA Filters	≥ 99.5%
Tanks 29, 31	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	≥ 0.15 inches WC
	iii. Exhaust HEPA Filter	≥ 99.5%
Tanks 35, 36, 37, 39	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	≥ 0.12 inches WC
	iii. Exhaust HEPA Filter	≥ 99.5%
Tanks 38, 42, 43, 50	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	≥ 0.24 inches WC
	iii. Exhaust HEPA Filter	≥ 99.5%
Tank 40	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	≥ 0.45 inches WC
	iii. Exhaust HEPA Filter	≥ 99.5%

Table 3.8.1-3 (Sheet 2 of 2)
Waste Tank Purge Ventilation System
Required Components
H-Area Tank Farm

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tank 49	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	$\geq$ 0.5 inches WC
	iii. Exhaust HEPA Filter	$\geq$ 99.5%
Tank 51	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Ventilation Exhaust Flow Indicator (1)	$\geq$ 1.1 inches WC
	iii. Exhaust HEPA Filter	$\geq$ 99.5%

Footnotes:

(1) The flow indication requirements of this LCO only apply to a waste storage tank when it is classified as a RAPID GENERATION TANK, except as addressed by Condition E.

Table 3.8.1-4
Waste Tank Purge Ventilation System Exhaust Flow Requirements While in Condition E
F-Area Tank Farm

PROCESS AREA	PARAMETER	SETPOINT / REQUIRED VALUE
Tanks 1, 2, 3, 4, 5, 6, 8, 18	Ventilation Exhaust Flow	$\geq$ 0.114 inches WC
Tank 7	Ventilation Exhaust Flow	$\geq$ 0.19 inches WC
Tank 19	Ventilation Exhaust Flow	$\geq$ 0.04 inches WC
Tanks 25, 28	Ventilation Exhaust Flow	$\geq$ 0.126 inches WC
Tanks 26, 27, 44, 45, 46, 47	Ventilation Exhaust Flow	$\geq$ 0.35 inches WC
Tanks 33, 34	Ventilation Exhaust Flow	$\geq$ 0.0775 inches WC

Table 3.8.1-5
Waste Tank Purge Ventilation System Exhaust Flow Requirements While in Condition E
H-Area Tank Farm

PROCESS AREA	PARAMETER	SETPOINT / REQUIRED VALUE
Tanks 9, 10, 11, 12, 14, 15, 21, 22, 23, 24	Ventilation Exhaust Flow	$\geq$ 0.115 inches WC
Tank 13	Ventilation Exhaust Flow	$\geq$ 0.26 inches WC
Tanks 29, 31	Ventilation Exhaust Flow	$\geq$ 0.1736 inches WC
Tank 30	Ventilation Exhaust Flow	$\geq$ 0.29 inches WC
Tank 32	Ventilation Exhaust Flow	$\geq$ 0.3 inches WC
Tanks 35, 36, 37, 39	Ventilation Exhaust Flow	$\geq$ 0.16 inches WC
Tanks 38, 43	Ventilation Exhaust Flow	$\geq$ 0.35 inches WC
Tank 40	Ventilation Exhaust Flow	$\geq$ 0.525 inches WC
Tank 41	Ventilation Exhaust Flow	$\geq$ 0.126 inches WC
Tanks 42, 50	Ventilation Exhaust Flow	$\geq$ 0.33 inches WC
Tank 49	Ventilation Exhaust Flow	$\geq$ 0.5 inches WC
Tank 51	Ventilation Exhaust Flow	$\geq$ 1.375 inches WC

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.2 Hydrogen Monitoring – RAPID GENERATION TANKS

LCO 3.8.2: The waste tank bulk vapor space hydrogen concentration shall be less than or equal to the LFL limits stated in the ERD (N-ESR-G-00001).

MODE APPLICABILITY: OPERATION, CHEMICAL CLEANING

PROCESS AREA APPLICABILITY: RAPID GENERATION TANKS, excluding Tank 50 (see ERD for current classification of individual tanks)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------ **NOTE** -------------- If this Condition is entered when OPERATION MODE is entered from GAS RELEASE MODE, the Completion Times for the Required Actions of this Condition shall start at the time the condition was initially discovered. ------------------------------------- A. Waste tank bulk vapor space hydrogen concentration is greater than the LFL limit stated in the ERD. **<u>OR</u>** When directed by LCO 3.8.1 Condition F.	--------------- **NOTE** ------------- Required Action A.1 shall not prevent liquid additions necessary to place the tank in a safe condition. -- A.1 Stop liquid additions, except for CONTINGENCY TRANSFERS, into the affected tank. **<u>AND</u>** A.2 Stop WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected tank. **<u>AND</u>** A.3 Stop waste tank mixing devices in the affected tank. **<u>AND</u>** (continued on next page)	 IMMEDIATELY IMMEDIATELY IMMEDIATELY

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Ensure forced ventilation is operating on the affected tank	24 Hours **AND** Every 12 Hours thereafter
	AND	
	A.5 Reduce hydrogen concentration to less than or equal to the LFL limit stated in the ERD in the affected tank.	7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.2.1	Deleted.	
SR 4.8.2.2	Verify waste tank bulk vapor space hydrogen concentration is less than or equal to the LFL limit stated in the ERD using a portable LFL monitor.	24 Hours
SR 4.8.2.3	Deleted.	
SR 4.8.2.4	Deleted.	
SR 4.8.2.5	Deleted.	

CROSS REFERENCES

TITLE	NUMBER
Waste Tank Purge Ventilation System	3.8.1
Hydrogen Monitoring – GAS RELEASE	3.8.10

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.3 Hydrogen Monitoring – SLOW GENERATION TANKS

LCO 3.8.3: The waste tank bulk vapor space hydrogen concentration shall be less than or equal to the LFL limits stated in the ERD (N-ESR-G-00001).

MODE APPLICABILITY: OPERATION, CHEMICAL CLEANING

PROCESS AREA APPLICABILITY: SLOW GENERATION TANKS, excluding Tank 50 (see ERD for current classification of individual tanks)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------ **NOTE** -------------- If this Condition is entered when OPERATION MODE is entered from GAS RELEASE MODE, the Completion Times for the Required Actions of this Condition shall start at the time the condition was initially discovered. ------------------------------------- A. Waste tank bulk vapor space hydrogen concentration is greater than the LFL limit stated in the ERD.	--------------- **NOTE** ------------- Required Action A.1 shall not prevent liquid additions necessary to place the tank in a safe condition. -- A.1 Stop liquid additions, except for CONTINGENCY TRANSFERS, into the affected tank. **<u>AND</u>** A.2 Stop WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected tank. **<u>AND</u>** A.3 Stop waste tank mixing devices in the affected tank. **<u>AND</u>** (continued on next page)	 IMMEDIATELY IMMEDIATELY IMMEDIATELY

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Ensure forced ventilation is operating on the affected tank. **AND** A.5 Reduce hydrogen concentration to less than or equal to the LFL limit stated in the ERD in the affected tank.	72 Hours **AND** Every 24 Hours thereafter 7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.3.1	Verify waste tank bulk vapor space hydrogen concentration is less than or equal to the LFL limit stated in the ERD using a portable LFL monitor.	7 Days

CROSS REFERENCES

TITLE	NUMBER
Hydrogen Monitoring – GAS RELEASE	3.8.10

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.4 Waste Storage Tank Level

LCO 3.8.4: The liquid level in waste storage tanks shall be less than or equal to the fill limits stated in the ERD (N-ESR-G-00001).

AND

The Waste Storage Tank Level monitoring components stated in Table 3.8.4-1 shall be OPERABLE.

MODE APPLICABILITY: GAS RELEASE, OPERATION, CHEMICAL CLEANING

PROCESS AREA APPLICABILITY: Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, and 51

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Tank liquid level is greater than the fill limit stated in the ERD. **<u>OR</u>** Required Actions B.3 or C.3 or the associated Completion Times are not met.	---------------- **NOTE** -------------- Required Action A.1 shall not prevent liquid additions necessary to place the tank in a safe condition. ---	
	A.1 Stop liquid additions, except for CONTINGENCY TRANSFERS, into the affected tank.	IMMEDIATELY
	<u>AND</u>	
	A.2 Stop waste tank mixing devices in the affected tank.	IMMEDIATELY
	<u>AND</u>	
	A.3 Verify that the affected tank has a time to LFL (CLFL for Tank 50) greater than or equal to 7 Days.	24 Hours
	<u>AND</u>	
	A.4 Determine flammability classification of the affected tank.	24 Hours
	<u>AND</u>	
	A.5 Reduce level in the affected tank to less than or equal to the fill limit stated in the ERD.	30 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required component stated in Table 3.8.4-1 is inoperable, except as addressed by Condition C.	---------------- **NOTE** -------------- Required Action B.1 shall not prevent liquid additions necessary to place the tank in a safe condition. ---	
	B.1 Stop liquid additions, except for CONTINGENCY TRANSFERS, into the affected tank.	IMMEDIATELY
	AND	
	B.2 Stop waste tank mixing devices in the affected tank.	IMMEDIATELY
	AND	
	---------------- **NOTE** -------------- Performance of Required Action B.3 within 24 Hours is not required if it has been completed within the 2 Hours preceding entry into this Condition. ---	
	---------------- **NOTE** -------------- Upon initial completion of Required Action B.3, non-waste liquid additions to the affected tank may occur. ---	
	B.3 Verify that affected tank liquid level is less than or equal to the fill limit stated in the ERD.	24 Hours **AND** Every 7 Days thereafter
	AND	
	B.4 Restore the required HLLCP/alarm to OPERABLE status in the affected tank.	30 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------- **NOTE** ------------- This Condition shall be entered prior to the initiation of acidic spray washing activities in a waste tank. This Condition may not be exited until 10 days after completion of acidic spray washing activities in the affected tank. -------------------------------------		
C. Required component stated in Table 3.8.4-1 is inoperable for waste tank acidic spray washing.	C.1 Stop liquid additions, except for batch additions from a supply tank(s) of less than or equal to 8,000 gallons total volume that do not have continuous makeup capability, into the affected tank.	IMMEDIATELY
	AND	
	C.2 Stop waste tank mixing devices in the affected tank.	IMMEDIATELY
	AND	
	C.3 Verify that affected tank liquid level is less than or equal to the acidic spray washing fill limit stated in the ERD.	24 Hours **AND** Every 7 Days thereafter
	AND	
	--------------- **NOTE** ------------- This Condition may not be exited until 10 days after completion of acidic spray washing activities in the affected tank. --	
	C.4 Restore the required HLLCP/alarm to OPERABLE status in the affected tank.	30 Days after completion of acidic spray washing activities

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action A.3 or the associated Completion Time is not met.	---------------- **NOTE** -------------- Required Action D.1 is not applicable to Tank 50. ---	
	D.1 Verify hydrogen concentration is less than or equal to the LFL limit stated in the ERD in the affected tank.	6 Hours **AND** Every 6 Hours thereafter
	AND	
	D.2 Ensure that forced ventilation is operating on the affected tank.	6 Hours **AND** Every 6 Hours thereafter
	AND	
	---------------- **NOTE** -------------- Required Action D.3 is applicable only for Tank 50. ---	
	D.3 Perform SR 4.8.14.1.	12 Hours **AND** Every 12 Hours thereafter
	AND	
	D.4 Restore time to LFL (CLFL for Tank 50) to greater than or equal to 7 Days in the affected tank.	30 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
---------------------------------- **NOTE** ----------------------------------- SR 4.8.4.1 is not required to be performed while the conductivity probe is in alarm. --		
SR 4.8.4.1	Perform an INSTRUMENT LOOP TEST on the HLLCPs and alarms stated in Table 3.8.4-1.	7 Days
SR 4.8.4.2	Verify HLLCPs are set at or below the fill limits stated in the ERD.	10 Years

CROSS REFERENCES

TITLE	NUMBER
Tank 50 Waste Temperature Monitoring	3.8.14

Table 3.8.4-1
Waste Storage Tank Level Monitoring Required Components
F & H-Area Tank Farms

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE (inches above tank bottom)**
Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51	A. HLLCP	See ERD
	B. HLLCP Control Room Alarm	

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.5 Annulus Level / Ventilation

LCO 3.8.5: The waste level in tank annuli shall be less than or equal to the values stated in Tables 3.8.5-1, 3.8.5-2, and 3.8.5-3.

AND

Forced ventilation shall be operated on Type I and II tank annuli (Tanks 1 – 15) at a frequency and duration sufficient to maintain the flammable vapor concentration of the annulus vapor space less than or equal to 25% of the LFL.

AND

The annulus leak detection components stated in Tables 3.8.5-1, 3.8.5-2, and 3.8.5-3 shall be OPERABLE when used to monitor annulus level for Surveillance Requirements.

MODE APPLICABILITY: GAS RELEASE, OPERATION, CHEMICAL CLEANING

PROCESS AREA APPLICABILITY: Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, and 51

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in a tank annulus is greater than the value stated in Table 3.8.5-1, 3.8.5-2, or 3.8.5-3. **<u>OR</u>** Forced ventilation has not operated as required on a Type I or II tank annulus (Tanks 1 – 15). **<u>OR</u>** Required Action B.1.1 or B.1.2 or the associated Completion Times are not met. **<u>OR</u>** When directed by LCO 3.8.6 Condition B.	A.1 Stop WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, through the affected tank annulus.	IMMEDIATELY
	<u>AND</u>	
	A.2 Purge the vapor space of the affected annulus with 12 vapor space turnovers per the ERD.	7 Days **<u>AND</u>** Every 7 Days thereafter
	<u>AND</u>	
	---------------- **NOTE** -------------- Negative pressure filtered annulus ventilation shall be used when jetting the annulus to meet Required Action A.3. See Administrative Control 5.8.2.23. --	
	A.3 Ensure that waste level in the affected annulus is less than or equal to the value stated in Table 3.8.5-1, 3.8.5-2, or 3.8.5-3.	90 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
------------- **NOTE** -------------- Entry into this Condition may also require entry into Condition A of LCO 3.8.6. -------------------------------------- B. Required component stated in Table 3.8.5-1, 3.8.5-2, or 3.8.5-3 is inoperable when needed to monitor annulus level for SRs.	B.1.1 Verify waste level in the affected annulus is less than or equal to the value stated in Table 3.8.5-1 or 3.8.5-3 using an alternate monitoring device if in GAS RELEASE or OPERATION MODE.	3 Days **AND** Every 7 Days thereafter
	OR	
	B.1.2 Verify waste level in the affected annulus is less than or equal to the value stated in Table 3.8.5-2 using an alternate monitoring device if in CHEMICAL CLEANING MODE.	3 Days **AND** Every 3 Days thereafter
	AND	
	B.2 Restore the required annulus leak detection instrument to OPERABLE status.	60 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
---------------------------------- **NOTE** ------------------------------------ SR 4.8.5.1 is only required for waste tanks in GAS RELEASE and OPERATION MODES. ---	
SR 4.8.5.1 Verify that the annulus waste level is less than or equal to the value stated in Table 3.8.5-1 or 3.8.5-3.	7 Days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE REQUIREMENT		FREQUENCY
---------- **NOTE** ---------- SR 4.8.5.2 is only required for waste tanks in GAS RELEASE and OPERATION MODES. ----------		
SR 4.8.5.2	Operate forced ventilation on the annulus of Type I and II tanks (Tanks 1 - 15) for a sufficient duration to provide 12 vapor space turnovers.	85 Days
---------- **NOTE** ---------- SR 4.8.5.3 is only required for waste tanks in GAS RELEASE and OPERATION MODES. SR 4.8.5.3 is not required to be performed while the conductivity probe is in alarm. ----------		
SR 4.8.5.3	Perform an INSTRUMENT LOOP TEST on the leak detection instrumentation and alarms stated in Tables 3.8.5-1 and 3.8.5-3.	7 Days
SR 4.8.5.4	Verify conductivity probes are set at or below the value stated in Tables 3.8.5-1, 3.8.5-2, and 3.8.5-3.	10 Years
---------- **NOTE** ---------- SR 4.8.5.5 is only required for waste tanks in CHEMICAL CLEANING MODE. ----------		
SR 4.8.5.5	Verify that the annulus waste level is less than or equal to the value stated in Table 3.8.5-2.	3 Days
---------- **NOTE** ---------- SR 4.8.5.6 is only required for waste tanks in CHEMICAL CLEANING MODE. ----------		
SR 4.8.5.6	Operate forced ventilation on the annulus of Type I tanks (Tanks 1 - 8) for a sufficient duration to provide 12 vapor space turnovers.	3 Days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE REQUIREMENT		FREQUENCY
---------------------------------- **NOTE** ------------------------------------ SR 4.8.5.7 is only required for waste tanks in CHEMICAL CLEANING MODE. SR 4.8.5.7 is not required to be performed while the conductivity probe is in alarm. --		
SR 4.8.5.7	Perform an INSTRUMENT LOOP TEST on the leak detection instrumentation and alarms stated in Table 3.8.5-2.	3 Days

CROSS REFERENCES

TITLE	NUMBER
Annulus Leak Detection Instruments	3.8.6

Table 3.8.5-1
Annulus Leak Detection Required Components - GAS RELEASE and OPERATION
F-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE (inches above annulus floor)
Tanks 1, 2, 3, 4, 5, 6, 7, 8 (1, 2)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 21 inches
Tanks 25, 26, 27, 28, 44, 45, 46, 47 (1)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 5.8 inches
Tanks 33, 34 (1)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 5.5 inches

Footnotes:

(1) Only when a Conductivity Probe is needed to perform an SR.
(2) See Table 3.8.5-2 for waste tanks in CHEMICAL CLEANING MODE.

Table 3.8.5-2
Annulus Leak Detection Required Components - CHEMICAL CLEANING
F-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE (inches above annulus floor)
Tanks 1, 2, 3, 4, 5, 6, 7, 8 (1, 2)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 12 inches

Footnotes:

(1) Only when a Conductivity Probe is needed to perform an SR.
(2) See Table 3.8.5-1 for waste tanks in GAS RELEASE or OPERATION MODE.

Table 3.8.5-3
Annulus Leak Detection Required Components
H-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE (inches above annulus floor)
Tanks 9, 10, 11, 12 (1)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 21 inches
Tanks 13, 14, 15 (1)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 23 inches
Tanks 29, 30, 31, 32 (1)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 5.5 inches
Tanks 35, 36, 37, 38, 39, 41, 42, 43, 49, 51 (1)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 5.8 inches
Tank 40 (1)	A. Outer Annulus Conductivity Probe B. Outer Annulus Conductivity Probe Control Room Alarm	≤ 2.0 inches

Footnotes:

(1) Only when a Conductivity Probe is needed to perform an SR.

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.6 Annulus Leak Detection Instruments

LCO 3.8.6: The annulus leak detection components stated in Table 3.8.6-1 shall be OPERABLE.

MODE APPLICABILITY:

GAS RELEASE, when a transfer line through the tank annulus is in HIGH-REM TRANSFER MODE
GAS RELEASE, when a transfer line through the Tank 40 annulus is in OPERATION MODE with ESP SLUDGE SLURRY
OPERATION, when a transfer line through the tank annulus is in HIGH-REM TRANSFER MODE
OPERATION, when a transfer line through the Tank 40 annulus is in OPERATION MODE with ESP SLUDGE SLURRY

PROCESS AREA APPLICABILITY: Tanks 29, 30, 31, 32, 35, 36, 37, 38, 39, 40, 41, 42, 43, 49, and 51

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
-------------- **NOTE** ------------- Entry into this Condition may also require entry into Condition B of LCO 3.8.5. ---------------------------------------	---------------- **NOTE** -------------- Upon entry into Condition A, Required Action A.2 shall be completed. ---	
A. Required component stated in Table 3.8.6-1 is inoperable.	A.1 Stop WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, through the affected tank annulus.	IMMEDIATELY
	<u>**AND**</u>	
	A.2 Verify waste level in the affected annulus is less than or equal to the value stated in Table 3.8.6-1 using an alternate monitoring device.	24 Hours
B. Required Action A.2 or the associated Completion Time is not met.	B.1 Enter Condition A of LCO 3.8.5.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.6.1	Perform an INSTRUMENT LOOP TEST on the leak detection instrumentation and alarms stated in Table 3.8.6-1.	7 Days
SR 4.8.6.2	Verify conductivity probes are set at or below the value stated in Table 3.8.6-1.	10 Years

CROSS REFERENCES

TITLE	NUMBER
Annulus Level / Ventilation	3.8.5

Table 3.8.6-1
Annulus Leak Detection Required Components
H-Area Tank Farm

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE (inches above annulus floor)**
Tanks 29, 30, 31, 32 (1)	A. Outer Annulus Conductivity Probe	≤ 5.5 inches
	B. Outer Annulus Conductivity Probe Control Room Alarm	
Tanks 35, 36, 37, 38, 39, 41, 42, 43, 49, 51 (1)	A. Outer Annulus Conductivity Probe	≤ 5.8 inches
	B. Outer Annulus Conductivity Probe Control Room Alarm	
Tank 40 (2)	A. Outer Annulus Conductivity Probe	≤ 2.0 inches
	B. Outer Annulus Conductivity Probe Control Room Alarm	

Footnotes:

(1) Only when a transfer line through the tank annulus is in HIGH-REM TRANSFER MODE.
(2) Only when a transfer line through the tank annulus is in either HIGH-REM TRANSFER MODE or OPERATION MODE with ESP SLUDGE SLURRY.

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.7 Chromate Cooling Water Siphon Breakers

LCO 3.8.7: The supply header Chromate Cooling Water siphon breaker(s) stated in Table 3.8.7-1 shall be OPERABLE.

AND

For Tanks 29, 31, and 32, the siphon breakers shall be aligned to the associated Chromate Cooling Water System supply distribution header.

AND

The return header Chromate Cooling Water siphon breaker(s) stated in Table 3.8.7-1 shall be OPERABLE.

AND

For Tanks 29, 31, and 32, the siphon breakers shall be aligned to the associated Chromate Cooling Water System return distribution header.

MODE APPLICABILITY: GAS RELEASE, except when vent path(s) exist sufficient to prevent siphons through the supply and return headers
OPERATION, except when vent path(s) exist sufficient to prevent siphons through the supply and return headers

PROCESS AREA APPLICABILITY: Tanks 29, 30, 31, 32, 33, 34, and 35

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Chromate Cooling Water System siphon breakers are intentionally isolated from header(s).	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable if Required Action A.1 is met. -- A.1 Verify Chromate Cooling Water pump house surge tank has observable level. **AND** A.2 Realign all required OPERABLE siphon breakers to the Chromate Cooling Water System supply and return headers.	1 Hour **AND** Every 1 Hour thereafter 72 Hours
B. For Tanks 29, 30, 31, and 32 or Tank 35, one of the required Chromate Cooling Water System supply header siphon breakers is inoperable. **OR** For Tanks 29, 30, 31, and 32 or Tank 35, one of the required Chromate Cooling Water System return header siphon breakers is inoperable.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable to MODE changes during restoration of siphon breaker(s). -- B.1 Restore inoperable siphon breaker(s) to OPERABLE status.	14 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. All Chromate Cooling Water System supply header siphon breakers are inoperable on an affected tank (except as addressed by Condition A). **OR** For Tanks 29, 31, and 32 the required Chromate Cooling Water System supply header siphon breakers are not aligned to the associated distribution header (except for intentional isolation). **OR** Required Actions and/or the associated Completion Times of Condition A or B are not met for a supply header siphon breaker.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable if Required Action C.2 is met. --- C.1.1 Align an OPERABLE siphon breaker to the Chromate Cooling Water System supply header.	IMMEDIATELY
	AND ---------------- **NOTE** -------------- Required Action C.1.2 is not applicable to Tanks 30, 33, 34, and 35. --- C.1.2 Align an OPERABLE siphon breaker to the associated supply distribution header.	IMMEDIATELY
	OR C.2 Isolate cooling coils in the affected tank(s) from the Chromate Cooling Water System supply header.	IMMEDIATELY

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. All Chromate Cooling Water System return header siphon breakers are inoperable on an affected tank (except as addressed by Condition A). **OR** For Tanks 29, 31, and 32 the required Chromate Cooling Water System return header siphon breakers are not aligned to the associated distribution header (except for intentional isolation). **OR** Required Actions and/or the associated Completion Times of Condition A or B are not met for a return header siphon breaker.	---------------- **NOTE** -------------- LCO 3.0.4 is not applicable if Required Action D.2 is met. ---	
	D.1.1 Align an OPERABLE siphon breaker to the Chromate Cooling Water System return header. **AND**	IMMEDIATELY
	---------------- **NOTE** -------------- Required Action D.1.2 is not applicable to Tanks 30, 33, 34, and 35. ---	
	D.1.2 Align an OPERABLE siphon breaker to the associated return distribution header. **OR**	IMMEDIATELY
	D.2 Isolate cooling coils in the affected tank(s) from the Chromate Cooling Water System return header.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
---------------------------------- **NOTE** ---------------------------------- SR 4.8.7.1 is not required for a Chromate Cooling Water System siphon breaker that is intentionally isolated from the header. --		
SR 4.8.7.1	Verify the siphon breaker isolation valves are open.	7 Days
---------------------------------- **NOTE** ---------------------------------- SR 4.8.7.2 is not applicable to Tanks 30, 33, 34, and 35. SR 4.8.7.2 is not required for a Chromate Cooling Water System siphon breaker that is intentionally isolated from the header. --		
SR 4.8.7.2	Verify the siphon breakers are aligned to the Chromate Cooling Water System supply and return distribution headers.	7 Days
SR 4.8.7.3	Inspect the siphon breaker vent path for blockage.	90 Days
SR 4.8.7.4	Verify that the siphon breaker actuates when the pressure at the component is greater than or equal to –0.5 psig.	5 Years

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.8.7-1
Chromate Cooling Water System Siphon Breakers
Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tanks 29, 30, 31, 32 (1)	A. Two Supply Header Siphon Breakers	≥ -0.5 psig
	B. Two Return Header Siphon Breakers	≥ -0.5 psig
Tanks 33, 34 (2)	A. Supply Header Siphon Breaker	≥ -0.5 psig
	B. Return Header Siphon Breaker	≥ -0.5 psig
Tank 35	A. Two Supply Header Siphon Breakers	≥ -0.5 psig
	B. Two Return Header Siphon Breakers	≥ -0.5 psig

Footnotes:

(1) Tanks 29, 30, 31, and 32 are associated with common Chromate Cooling Water System distribution headers (supply and return). The siphon breakers located on top of Tank 30 support all four tanks.

(2) Tanks 33 and 34 are associated with common Chromate Cooling Water System distribution headers (supply and return). The siphon breakers located near Tank 34 support both tanks.

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.8 Not Used

LCO 3.8.8: Not Used

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.9 Waste Tank Purge Ventilation System – GAS RELEASE

LCO 3.8.9: The Waste Tank Purge Ventilation System shall be OPERABLE.

AND

The exhaust flow indicator reading shall be greater than or equal to the value stated in Tables 3.8.9-1 and 3.8.9-2.

AND

The Waste Tank Purge Ventilation System components stated in Tables 3.8.9-1 and 3.8.9-2 shall be OPERABLE.

MODE APPLICABILITY: GAS RELEASE

PROCESS AREA APPLICABILITY: Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 49, and 51

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required exhaust low flow interlock loop is inoperable.	A.1 Restore inoperable equipment to OPERABLE status.	30 Days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Waste Tank Purge Ventilation System is inoperable, except as addressed by Condition C. **<u>OR</u>** Exhaust flow is less than the value stated in Table 3.8.9-1 or 3.8.9-2. **<u>OR</u>** Both required exhaust low flow interlock loops are inoperable. **<u>OR</u>** Required Action C.1 and the associated Completion Time are not met.	---------------- **NOTE** -------------- Interlock action should trip waste tank mixing devices, close dissolution liquid addition valves, and stop pumps/jets removing interstitial liquid, as applicable, due to low exhaust flow. -- ---------------- **NOTE** -------------- Required Action B.1 shall not prevent liquid additions necessary to place the tank in a safe condition. --	
	B.1 Stop liquid additions into the affected tank.	IMMEDIATELY
	<u>AND</u>	
	B.2 Stop WASTE TRANSFERS out of the affected tank.	IMMEDIATELY
	<u>AND</u>	
	B.3 Ensure waste tank mixing devices in the affected tank are stopped.	IMMEDIATELY
	<u>AND</u>	
	---------------- **NOTE** -------------- Required Action B.4 shall not prohibit the normal air blow following jet operation. --	
	B.4 Isolate the transfer jet in the affected tank from its steam and air supplies.	IMMEDIATELY
	<u>AND</u>	
	(continued on next page)	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.5 Ensure forced ventilation is operating on the affected tank. **AND** B.6 Place the affected tank in OPERATION MODE.	4 Days **AND** Every 24 Hours thereafter 7 Days
------------- **NOTE** --------------- This Condition is not applicable to ventilation systems that have only one installed HEPA filter or that require both HEPA filters. -------------------------------------- C. Required exhaust HEPA filter is inoperable.	C.1 Place an OPERABLE exhaust HEPA filter in service.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.9.1	Verify the exhaust flow indicator reading is greater than or equal to the value stated in Tables 3.8.9-1 and 3.8.9-2.	24 Hours
SR 4.8.9.2	Perform an INSTRUMENT LOOP TEST on the exhaust low flow interlock.	1 Year
----------------------------------- **NOTE** ------------------------------------ SR 4.8.9.3 is only required for tanks undergoing BULK SALT DISSOLUTION operations. --		
SR 4.8.9.3	Verify that the required dissolution liquid addition valve closes when directed by a simulated or actual interlock signal (see Tables 3.8.9-1 and 3.8.9-2).	1 Year

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE REQUIREMENT		FREQUENCY
---------------------------------- **NOTE** ----------------------------------- SR 4.8.9.4 is only required for tanks undergoing sludge agitation operations or BULK SALT DISSOLUTION operations using waste tank mixing devices. --		
SR 4.8.9.4	Verify that the power supplies to the waste tank mixing device motors de-energize when directed by a simulated or actual interlock signal (see Tables 3.8.9-1 and 3.8.9-2).	1 Year
SR 4.8.9.5	Perform an INSTRUMENT LOOP CALIBRATION on the exhaust flow indicator and control room alarm.	1 Year
SR 4.8.9.6	Verify that the HEPA filters stated in Tables 3.8.9-1 and 3.8.9-2 have an in-place performance test efficiency greater than or equal to 99.5%.	18 Months
---------------------------------- **NOTE** ----------------------------------- SR 4.8.9.7 is only required for tanks undergoing interstitial liquid removal operations. --		
SR 4.8.9.7	Verify that the transfer pump/jet stops when directed by a simulated or actual interlock signal (see Tables 3.8.9-1 and 3.8.9-2).	1 Year
---------------------------------- **NOTE** ----------------------------------- SR 4.8.9.8 is only required for the following tanks: Tanks 9, 10, 11, 12, 13, 14, 15, 21, 22, 23, 24, 40, 41, 42, 49, 51. --		
SR 4.8.9.8	Perform an INSTRUMENT LOOP TEST on the alarms stated in Table 3.8.9-2.	7 Days

CROSS REFERENCES

TITLE	NUMBER
Waste Tank Purge Ventilation System	3.8.1
Waste Tank Purge Portable Ventilation Equipment	3.8.13

Table 3.8.9-1 (Sheet 1 of 3)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
F-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tanks 1, 2, 3, 4, 5, 6, 8, 18, 25, 28	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop consists of the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.1 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.1 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.1 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A
Tank 7	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop consists of the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.18 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.18 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.18 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Table 3.8.9-1 (Sheet 2 of 3)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
F-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tank 19	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Both Exhaust HEPA Filters	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop consists of the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.04 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.04 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.04 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A
Tanks 26, 27, 44, 45, 46, 47	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop consists of the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.24 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.24 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.24 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Table 3.8.9-1 (Sheet 3 of 3)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
F-Area Tank Farm

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tanks 33, 34	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop consists of the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.06 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.06 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.06 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Footnotes:

(1) The low flow interlock shall stop waste tank mixing devices. This interlock / interlocked component is only required on tanks undergoing bulk agitation of sludge or BULK SALT DISSOLUTION using waste tank mixing devices.

(2) The low flow interlock shall close the dissolution liquid addition valve. This interlock / interlocked component is only required on tanks undergoing BULK SALT DISSOLUTION.

(3) The low flow interlock shall stop the transfer pump/jet. This interlock / interlocked component is only required on tanks undergoing interstitial liquid removal from saltcake.

Table 3.8.9-2 (Sheet 1 of 5)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
H-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tanks 9, 10, 11, 12, 14, 15, 22, 23, 24, 41	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop consists of the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.1 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.1 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.1 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A
Tanks 13, 30, 32	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop consists of the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.2 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.2 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.2 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Table 3.8.9-2 (Sheet 2 of 5)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
H-Area Tank Farm

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tank 21	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Both Exhaust HEPA Filters	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop contains the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.1 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.1 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.1 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A
Tanks 29, 31	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop contains the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.15 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.15 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.15 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Table 3.8.9-2 (Sheet 3 of 5)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
H-Area Tank Farm

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tanks 35, 36, 37	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop contains the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.12 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.12 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.12 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A
Tanks 38, 42, 43	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop contains the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.24 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.24 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.24 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Table 3.8.9-2 (Sheet 4 of 5)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
H-Area Tank Farm

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tank 40	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop contains the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.45 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.45 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.45 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A
Tank 49	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop contains the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 0.5 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 0.5 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 0.5 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Table 3.8.9-2 (Sheet 5 of 5)
Waste Tank Purge Ventilation System - GAS RELEASE
Required Components
H-Area Tank Farm

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tank 51	A. Waste Tank Purge Ventilation System	
	i. Exhaust Fan	N/A
	ii. Exhaust HEPA Filter	$\geq$ 99.5%
	B. Two Ventilation Exhaust Low Flow Interlock Loops (each loop contains the following as required)	
	i. Ventilation Exhaust Low Flow Interlock (1, 2, 3)	$\geq$ 1.1 inches WC
	ii. Ventilation Exhaust Flow Indicator	$\geq$ 1.1 inches WC
	iii. Ventilation Exhaust Low Flow Control Room Alarm	$\geq$ 1.1 inches WC
	iv. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	v. Interlocked Waste Tank Mixing Device Breaker/ Disconnect (1)	N/A
	vi. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Footnotes:

(1) The low flow interlock shall stop waste tank mixing devices. This interlock / interlocked component is only required on tanks undergoing bulk agitation of sludge or BULK SALT DISSOLUTION using waste tank mixing devices.
(2) The low flow interlock shall close the dissolution liquid addition valve. This interlock / interlocked component is only required on tanks undergoing BULK SALT DISSOLUTION.
(3) The low flow interlock shall stop the transfer pump/jet. This interlock / interlocked component is only required on tanks undergoing interstitial liquid removal from saltcake.

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.10 Hydrogen Monitoring – GAS RELEASE

LCO 3.8.10: The waste tank bulk vapor space hydrogen concentration shall be less than or equal to the LFL limits stated in the ERD (N-ESR-G-00001).

AND

The hydrogen monitoring components stated in Table 3.8.10-1 shall be OPERABLE.

MODE APPLICABILITY: GAS RELEASE

PROCESS AREA APPLICABILITY: Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 49, and 51

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste tank bulk vapor space hydrogen concentration is greater than the LFL limit stated in the ERD. **OR** Required component stated in Table 3.8.10-1 is inoperable. **OR** Sample flow is outside the values stated in Table 3.8.10-1.	---------------- **NOTE** -------------- Interlock action should trip waste tank mixing devices, close dissolution liquid addition valves, and stop pumps/jets removing interstitial liquid, as applicable, due to high hydrogen concentration. --- ---------------- **NOTE** -------------- Required Action A.1 shall not prevent liquid additions necessary to place the tank in a safe condition. ---	
	A.1 Stop liquid additions into the affected tank.	IMMEDIATELY
	AND	
	A.2 Stop WASTE TRANSFERS out of the affected tank.	IMMEDIATELY
	AND	
	A.3 Ensure waste tank mixing devices in the affected tank are stopped.	IMMEDIATELY
	AND	
	A.4 Ensure forced ventilation is operating on the affected tank.	24 Hours **AND** Every 12 Hours thereafter
	AND	
	A.5 Place the affected tank in OPERATION MODE.	7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.10.1	Deleted	
SR 4.8.10.2	Verify sample flow to the waste tank LFL monitor is within the values stated in Table 3.8.10-1.	24 Hours
SR 4.8.10.3	Perform an INSTRUMENT LOOP CHECK on the waste tank LFL monitor.	7 Days
SR 4.8.10.4	Perform an INSTRUMENT LOOP CALIBRATION on the installed LFL monitors and associated control room alarm.	60 Days
SR 4.8.10.5	Perform an INSTRUMENT LOOP TEST on the required high hydrogen concentration interlock.	1 Year
---------------------------------- **NOTE** ---------------------------------- SR 4.8.10.6 is only required for tanks undergoing BULK SALT DISSOLUTION operations. --		
SR 4.8.10.6	Verify that the required dissolution liquid addition valve closes when directed by a simulated or actual interlock signal (see Table 3.8.10-1).	1 Year

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE REQUIREMENT		FREQUENCY
------------ **NOTE** ------------ SR 4.8.10.7 is only required for tanks undergoing sludge agitation operations or BULK SALT DISSOLUTION operations using waste tank mixing devices. ------------------------		
SR 4.8.10.7	Verify that the power supplies to the waste tank mixing device motors de-energize when directed by a simulated or actual interlock signal (see Table 3.8.10-1).	1 Year
SR 4.8.10.8	Perform an INSTRUMENT LOOP CHECK on the sample flow indicators stated in Table 3.8.10-1.	180 Days
SR 4.8.10.9	Perform an INSTRUMENT LOOP CALIBRATION on the installed LFL monitor low sample flow control room alarm.	1 Year
------------ **NOTE** ------------ SR 4.8.10.10 is only required for tanks undergoing interstitial liquid removal operations. ------------------------		
SR 4.8.10.10	Verify that the transfer pump/jet stops when directed by a simulated or actual interlock signal (see Table 3.8.10-1).	1 Year

CROSS REFERENCES

TITLE	NUMBER
Hydrogen Monitoring – RAPID GENERATION TANKS	3.8.2
Hydrogen Monitoring – SLOW GENERATION TANKS	3.8.3

Table 3.8.10-1
Waste Tank Hydrogen Monitoring - GAS RELEASE
Required Components
F & H-Area Tank Farms

PROCESS AREA	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 49, 51	A. LFL Monitor	N/A
	B. High Hydrogen Concentration Control Room Alarm	See ERD
	C. High Hydrogen Concentration Interlock (1, 2, 3)	See ERD
	D. Low Sample Flow Control Room Alarm	≥ 0.1 inches WC
	E. Sample Flow Indicator	≥ 1.5 scfh ≤ 2.5 scfh
	F. Interlocked Dissolution Liquid Addition Valve (2)	N/A
	G. Interlocked Waste Tank Mixing Device Breaker/Disconnect (1)	N/A
	H. Interlocked Transfer Pump/Jet Trip Device (3)	N/A

Footnotes:
(1) The high hydrogen concentration interlock shall stop waste tank mixing devices. This interlock / interlocked component is only required on tanks undergoing bulk agitation of sludge or BULK SALT DISSOLUTION using waste tank mixing devices.
(2) The high hydrogen concentration interlock shall close the dissolution liquid addition valve. This interlock / interlocked component is only required on tanks undergoing BULK SALT DISSOLUTION.
(3) The high hydrogen concentration interlock shall stop the transfer pump/jet. This interlock / interlocked component is only required on tanks undergoing interstitial liquid removal from saltcake.

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.11 Area Radiation Monitoring – Waste Storage Tanks

LCO 3.8.11: The hardwired, portable, and/or wireless ARMs identified in accordance with the ARM Location Program as required to provide coverage for waste storage tanks shall be OPERABLE.

AND

Radiation levels at the ARMs shall be less than or equal to the SETPOINTS of the instruments.

MODE APPLICABILITY:
GAS RELEASE, during Submersible Mixer Pump (SMP) operation
OPERATION, during SMP operation
CHEMICAL CLEANING, during waste tank mixing device operation
MECHANICAL CLEANING, during crawler lancing device operation from pressure sources > 10,000 psi

PROCESS AREA APPLICABILITY: Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 49, and 51

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ARM is inoperable. **OR** Radiation level at the ARM is greater than the SETPOINT of the instrument.	A.1 Stop waste tank mixing devices in the affected tank. **AND** A.2 Stop crawler lancing device operations in the affected tank.	IMMEDIATELY IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.8.11.1 Verify the alarm status of portable ARMs (without control room alarms).	15 Minutes
---------- **NOTE** ---------- SR 4.8.11.2 is not required to be performed while the ARM is in alarm. ---------- SR 4.8.11.2 Verify that the indicated radiation levels on the hardwired (with control room alarms) or portable ARMs (without control room alarms) are within the range of the meter.	24 Hours
---------- **NOTE** ---------- SR 4.8.11.3 is not required to be performed while the ARM is in alarm. ---------- ---------- **NOTE** ---------- Alarm received during performance of SR 4.8.11.3 does not require entry into Condition A. ---------- SR 4.8.11.3 Perform an INSTRUMENT LOOP TEST on the credited wireless ARMs (with control room alarms).	24 Hours
---------- **NOTE** ---------- SR 4.8.11.4 is not required to be performed while the ARM is in alarm. ---------- SR 4.8.11.4 Perform a SOURCE CHECK on the ARMs.	90 Days
SR 4.8.11.5 Perform an INSTRUMENT LOOP CALIBRATION on the ARMs.	1 Year

CROSS REFERENCES

TITLE	NUMBER
Area Radiation Monitoring – Above-Ground Transfer Lines	3.7.9

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.12 Submersible Mixer Pump Risers

LCO 3.8.12: The waste level in the SMP Risers that are not shown to be free-draining shall be less than or equal to the values stated in Table 3.8.12-1.

AND

The SMP Riser leak detection location required components stated in Table 3.8.12-1 shall be OPERABLE.

MODE APPLICABILITY: GAS RELEASE, during SMP operation
OPERATION, during SMP operation
CHEMICAL CLEANING, during SMP operation

PROCESS AREA APPLICABILITY: Waste Storage Tanks with SMP Risers that are not shown to be free-draining

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Waste level in an SMP riser is greater than the value stated in Table 3.8.12-1. **OR** Required component stated in Table 3.8.12-1 is inoperable.	---------------- **NOTE** -------------- Interlock action should complete Required Action A.1 by tripping the affected SMP due to high riser waste level. -- A.1 Stop SMP operations associated with the affected riser.	IMMEDIATELY

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.12.1	Perform an INSTRUMENT LOOP TEST on the conductivity probes stated in Table 3.8.12-1.	7 Days
SR 4.8.12.2	Perform an INSTRUMENT LOOP TEST on the leak detection interlock stated in Table 3.8.12-1.	1 Year
SR 4.8.12.3	Verify conductivity probes are set at or below the value stated in Table 3.8.12-1.	10 Years

CROSS REFERENCES

TITLE	NUMBER
None	

Table 3.8.12-1
SMP Riser Required Components
F & H-Area Tank Farms

LEAK DETECTION LOCATION	**REQUIRED COMPONENTS**	**SETPOINT / REQUIRED VALUE**
SMP Riser that is not shown to be free-draining	A. Conductivity Probe B. Conductivity Probe Interlock (1)	At or below 1 inch from the top of the Riser

Footnotes:

(1) The conductivity probe interlock shall stop the affected SMP.

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.13 Waste Tank Purge Portable Ventilation Equipment

LCO 3.8.13: The Waste Tank Purge Portable Ventilation Equipment stated in Table 3.8.13-1 shall be OPERABLE for the number of Portable Ventilation Units stated in the ERD (N-ESR-G-00001).

MODE APPLICABILITY: GAS RELEASE, OPERATION, CHEMICAL CLEANING

PROCESS AREA APPLICABILITY: Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, and 51

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Number of OPERABLE Portable Ventilation Units is less than the required number stated in the ERD.	A.1 Restore compliance with this LCO.	14 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.13.1	Verify that each portable ventilation blower assembly and generator can be started.	90 Days
SR 4.8.13.2	Perform a visual inspection to verify the required components stated in Table 3.8.13-1 are free from significant physical damage and stored correctly in the designated storage location.	90 Days

CROSS REFERENCES

TITLE	NUMBER
Waste Tank Purge Ventilation System	3.8.1
Waste Tank Purge Ventilation System – GAS RELEASE	3.8.9

Table 3.8.13-1
Waste Tank Purge Portable Ventilation Equipment Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tanks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51	A. Blower Assembly	N/A
	B. Generator	N/A
	C. Riser Connection	N/A
	D. Flexible Duct	N/A

3/4.8 WASTE STORAGE TANKS (EXCLUDING TANK 48)

3.8.14 Tank 50 Waste Temperature Monitoring

LCO 3.8.14: Tank 50 average bulk waste temperature shall be less than or equal to 39°C.

AND

Tank 50 waste temperature monitoring components stated in Table 3.8.14-1 shall be OPERABLE.

MODE APPLICABILITY: OPERATION

PROCESS AREA APPLICABILITY: Tank 50

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Tank 50 average bulk waste temperature is greater than 39°C. **OR** Required Action B.4 or the associated Completion Time is not met.	---------------- **NOTE** -------------- Required Action A.1 shall not prevent liquid additions necessary to place the tank in a safe condition. --- A.1 Stop transfers, except for CONTINGENCY TRANSFERS, into and out of Tank 50. **AND** A.2 Stop waste tank mixing devices. **AND** A.3 Secure steam to the annulus ventilation system. **AND** (continued on next page)	 IMMEDIATELY IMMEDIATELY 12 Hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Ensure forced ventilation is operating on Tank 50. **AND** A.5 Reduce average bulk waste temperature to less than or equal to 39°C.	24 Hours **AND** Every 12 Hours thereafter 7 Days
B. Required INSTRUMENT LOOP stated in Table 3.8.14-1 is inoperable.	---------------- **NOTE** -------------- Required Action B.1 shall not prevent liquid additions necessary to place the tank in a safe condition. -- B.1 Stop transfers, except for CONTINGENCY TRANSFERS, into and out of Tank 50. **AND** B.2 Stop waste tank mixing devices. **AND** B.3 Secure steam to the annulus ventilation system **AND** (continued on next page)	 IMMEDIATELY IMMEDIATELY 12 Hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	---------------- **NOTE** -------------- Performance of Required Action B.4 within 24 Hours is not required if it has been completed within the 2 Hours preceding entry into this Condition. --	
	B.4 Verify Tank 50 average bulk waste temperature is less than or equal to 39°C using an alternate monitoring device.	24 Hours **AND** Every 24 Hours thereafter
	AND	
	B.5 Restore the required waste temperature monitoring loop to OPERABLE status.	30 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.8.14.1	Verify average bulk waste temperature is less than or equal to 39°C.	24 Hours
SR 4.8.14.2	Perform an INSTRUMENT LOOP CHECK on the installed waste temperature monitoring loop stated in Table 3.8.14-1.	90 Days
SR 4.8.14.3	Perform an INSTRUMENT LOOP CALIBRATION on the installed waste temperature monitoring loop stated in Table 3.8.14-1.	1 Year

CROSS REFERENCES

TITLE	NUMBER
Waste Storage Tank Level	3.8.4

Table 3.8.14-1
Tank 50 Waste Temperature Monitoring Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Tank 50	A. Waste Temperature Monitoring Loop	
	i. Temperature Indicator	≤ 39°C
	ii. Temperature Element	N/A

3/4.9 ELECTRICAL POWER

3.9.1 Standby Electrical Power

LCO 3.9.1: The 254-13H Diesel Generator System, associated electrical distribution system, and support systems stated in Table 3.9.1-1 shall be OPERABLE.

MODE APPLICABILITY: OPERATION, STANDBY

PROCESS AREA APPLICABILITY: Pump Tanks HPT-7, HPT-8, HPT-9, HPT-10

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Diesel generator or support equipment stated in Table 3.9.1-1 is inoperable.	A.1 Restore the diesel generator to OPERABLE status.	7 Days
	OR	
	A.2.1 Provide a portable generator with a capacity that is greater than or equal to the loads required to be powered.	7 Days
	AND	
	A.2.2 Restore the inoperable diesel generator to OPERABLE status.	60 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.9.1.1	Verify that the starting battery for the 254-13H diesel generator is adequately charged.	30 Days
SR 4.9.1.2	Perform a diesel generator load test on the 254-13H diesel generator.	1 Year
SR 4.9.1.3	Cycle the Automatic Transfer Switch stated in Table 3.9.1-1.	1 Year
SR 4.9.1.4	Verify that the 254-13H diesel generator fuel tank is greater than or equal to 3/4 full.	Within 24 Hours after each diesel engine shutdown
SR 4.9.1.5	Check for and remove accumulated water from the diesel generator fuel oil storage tank.	30 Days
SR 4.9.1.6	Verify the particulate contamination in the diesel generator fuel oil storage tank is $\leq$ 20 mg/L.	90 Days
SR 4.9.1.7	Sample the new fuel oil and verify the following: a. API gravity is $\geq$ 30 and $\leq$ 38 b. Kinematic viscosity at 40°C is $\geq$ 1.9 centistokes and $\leq$ 4.1 centistokes c. Sediment and water is $\leq$ 0.05% by volume d. Flash Point is $\geq$ 125°F e. Visual appearance is clear and bright	Prior to adding new fuel to the storage tank
SR 4.9.1.8	Sample the new fuel oil and verify the following: a. Cloud point is $\leq$ 23°F b. Cetane number is $\geq$ 40 c. Particulate contamination is $\leq$ 10 mg/L	Within 30 Days of adding new fuel to the storage tank
SR 4.9.1.9	Perform a diesel generator no-load test on the 254-13H diesel generator.	90 Days

CROSS REFERENCES

TITLE	NUMBER
HDB-8 Complex Process Vessel Ventilation System	3.7.6

Table 3.9.1-1
254-13H Diesel Generator System
Required Components

PROCESS AREA	REQUIRED COMPONENTS	SETPOINT / REQUIRED VALUE
Common to all HDB-8 Complex Pump Tanks (HPT-7, HPT-8, HPT-9, HPT-10)	A. 254-13H Diesel Generator and Engine	N/A
	B. 254-13H Diesel Generator Fuel Oil Storage Tank	3/4 full
	C. 254-13H Diesel Generator Battery	N/A
	D. 254-13H Diesel Generator Automatic Transfer Switch	N/A

Section 5

Administrative Controls

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

5.1.1 The Facility Manager shall be responsible for the overall safe operation of the FACILITY and shall have control over those activities necessary for safe operation of the FACILITY. The Facility Manager shall delegate, in writing, the succession to this responsibility during any absences.

5.1.2 A Shift Manager, or in his absence a designated First-Line Manager, shall be responsible for the FACILITY command function. A management directive to this effect, signed by the Facility Manager, shall be issued to FACILITY personnel. As part of this command function, the Shift Manager or First-Line Manager shall ensure that the operation of the FACILITY is in accordance with approved TSRs.

5.2 Organization

5.2.1 Organization

a. Lines of authority, responsibility, and communication shall be defined and established for the highest management levels, through intermediate levels, down to and including all operating organization positions. These relationships shall be documented and updated, as appropriate, in the form of organization charts, functional descriptions of departmental responsibilities and relationships, and job descriptions for key personnel positions, or in equivalent forms of documentation.

b. The individuals who train the operating staff, carry out radiological control, or perform Quality Assurance (QA) functions may report to the Facility Manager; however, they shall have sufficient organizational freedom to ensure their independence from operating pressures.

5.2.2 FACILITY Staff

The FACILITY staff organization shall be as follows:

a. A current list of FACILITY support personnel shall be available to the Shift Manager. This list should include management, radiation safety, and technical support personnel.

b. Each on-duty shift shall be composed of at least the minimum shift crew composition shown in Table 5.2.2-1.

c. Administrative procedures shall be implemented to limit the working hours of staff who perform safety-related functions (e.g., personnel required to meet the minimum shift crew composition). Adequate shift coverage shall be maintained without routine heavy use of overtime. The overtime should be controlled in accordance with the following guidelines:

   1. An individual shall not be permitted to work more than 16 hours straight, excluding time for shift turnover or safety meetings.

   2. An individual shall not be permitted to work more than 24 hours in any 48-hour period, nor more than 72 hours in any 7-day period, all excluding time for shift turnover or safety meetings.

   3. A break of at least 2 days is required after 14 consecutive days on shift (a 24-hour break interrupts the consecutive-day sequence).

(continued)

5.2.2 FACILITY Staff (continued)

4. The use of overtime shall be considered on an individual basis and not for the entire staff on a shift, except during extended shutdown periods.

Any deviation from these requirements must be authorized in advance by the Facility Manager (or designee) in accordance with approved administrative procedures and with justification for granting the deviation.

Table 5.2.2-1
Minimum Facility Shift Crew Composition

Location	Shift Manager or First Line Manager	Operators (1)	Radiological Control Personnel
H-Area Tank Farm	1	7	1
F-Area Tank Farm	1	5	1

Footnotes:

(1) The minimum Operators required by Table 5.2.2-1 is adequate for up to and including three simultaneous Operational Conditions (listed below) in F-Area Tank Farm and four simultaneous Operational Conditions in H-Area Tank Farm. One additional Operator shall be added to the shift complement for every additional Operational Condition.

The minimum Operators required by Table 5.2.2-1 takes into consideration that the following control rooms are staffed with one Control Room Operator (any control room that contains DSA credited alarms must be continuously manned): 241-1F, 241-18F, 241-74F, 241-2H, 241-28H, 241-82H, and 242-1H. One additional Operator shall be added to the shift complement for each additional control room that contains DSA credited alarms.

(continued)

5.2.2 FACILITY Staff (continued)

Each of the following is considered an Operational Condition for the purposes of determining minimum required Operators:

- WASTE TRANSFER (excluding transfers from sumps and recycle transfers on operating evaporators),
- Evaporator operation (recycle transfer is part of evaporator operation and need not be counted as an additional Operational Condition if the evaporator is operating during the recycle transfer),
- Waste storage tank mixing activity (e.g., waste tank mixing device operation),
- Waste storage tank chemical cleaning activity,
- Waste storage tank mechanical cleaning activity,
- Waste storage tank that can become flammable in less than 24 hours following a seismic event,
- Waste storage tank BULK SALT DISSOLUTION (transfer of the dissolved salt solution is part of BULK SALT DISSOLUTION process and need not be counted as an additional Operational Condition), or
- Operation of Tank 48 except during NON-INERTED OPERATION.

5.3 Staff Qualification and Training

5.3.1 Qualification

A program shall be established to ensure that FACILITY staff who perform safety-related functions meet established qualification requirements for their positions. This program shall adhere to qualification requirements established in accordance with applicable DOE regulations.

5.3.2 Training

An initial training and continuing training program for the FACILITY staff shall be established and maintained. This program shall adhere to training requirements established in accordance with applicable DOE regulations.

5.4 Response Plans

The purpose of a RESPONSE PLAN is to ensure that additional analysis or administrative and management controls are in place when abnormal situations arise and when the FACILITY is outside of normal operating limits defined by the TSR. The RESPONSE PLAN has two functions. The first function is to restore the PROCESS AREA and/or FACILITY to TSR compliance. The second function is to determine what further actions are required to ensure that the FACILITY is operating within the framework of the TSRs. RESPONSE PLANS are intended to provide personnel with the direction needed to safely achieve a stated endpoint. These plans, however, do not prohibit reliance upon operator training and experience in the correction of the condition for immediate mitigation of an unsafe or worsening condition.

The RESPONSE PLAN addresses the situation where a TSR cannot be met (e.g., due to equipment inoperability) and the FACILITY must operate in continual TSR noncompliance (e.g., there is no MODE in which the noncompliant LCO or Administrative Control is not applicable). During the time that the TSR requirements are being restored, the PROCESS AREA and/or FACILITY operations shall be bounded by an approved RESPONSE PLAN.

The RESPONSE PLAN shall evaluate PROCESS AREA or FACILITY conditions to determine the risk to the FACILITY and the public from the limited operations allowed in the applicable MODE. These plans will typically implement compensatory actions or surveillances to reduce risk.

The RESPONSE PLANS shall be approved by the Facility Manager (or designee), the Tank Farm Facility Operations Safety Committee (FOSC), and the Department of Energy (DOE).

5.5 Repair Plans

The purpose of the REPAIR PLAN is to authorize and control entry of a PROCESS AREA into the REPAIR MODE. The REPAIR PLAN is a document approved by the Facility Manager and DOE that specifies, based on existing conditions, the detailed plan of action for allowing a specified PROCESS AREA to enter the REPAIR MODE. The plan also specifies the controls required for the applicable PROCESS AREA while in the REPAIR MODE. Compliance with applicable LCOs may be exempted on a case-by-case basis while in this MODE in accordance with the REPAIR PLAN.

An example of a condition that would warrant development of a REPAIR PLAN would include deinventory of a pump tank. It should be noted, however, that most FACILITY activities, including required maintenance activities, are already accommodated by the Required Actions contained in LCOs.

Each REPAIR PLAN shall be engineered such that flammable conditions are prevented in the affected vessel(s) and associated ventilation headers, and outside the affected vessel(s) and process piping, where applicable. Controls shall include the following as a minimum: control of flammable vapor concentrations, instrumentation necessary to ensure compliance with the plan (i.e., dilution flow, differential pressure, or flammable vapor concentration monitoring, as appropriate), and surveillances to periodically monitor compliance with the plan. Each plan shall also similarly address potential leakage/spill hazards of radioactive materials since normal equipment boundaries may be removed or modified during performance of the operations authorized by the REPAIR PLAN. Surveillances shall include controls for the instruments used to monitor compliance with the plan, as well as surveys of the instrument readings at a predetermined frequency. Compensatory measures, for conditions outside the REPAIR PLAN, shall be identified and proceduralized prior to implementation of the REPAIR PLAN.

Each REPAIR PLAN shall be evaluated using the Unreviewed Safety Question (USQ) process prior to performance and shall be approved by the Facility Manager (or designee), the Tank Farm FOSC, and DOE.

5.6 Reviews and Assessments

5.6.1 Facility Operations Safety Committee

5.6.1.1 Responsibilities

The FOSC advises the Facility Manager on matters affecting the operation of the FACILITY and associated activities that affect safety. During the performance of reviews, a cross-disciplinary determination/evaluation may be necessary. If deemed necessary, such reviews shall be performed by personnel of the appropriate discipline. Individual reviewers shall not review their own work or work for which they have direct responsibility. FOSC functions and responsibilities will be established according to approved procedure and shall contain the following as a minimum:

a. Review of proposed changes to TSRs and Bases

b. Review of proposed activities that involve a USQ evaluation

c. Review of proposed RESPONSE PLANS and REPAIR PLANS

5.6.1.2 Composition

The committee members must possess sufficient education, experience, and diversified expertise, along with safety analysis and technical training, to undertake the reviews that the committee is intended to perform.

5.6.2 WSRC Independent Assessment

An independent assessment of FACILITY activities and programs affecting nuclear safety shall be performed independent of the FACILITY staff. This independent assessment should provide for the integration of the reviews and audits into a cohesive program to provide senior-level management with an assessment of FACILITY operation and recommended actions to improve nuclear safety. The assessment should sample all applicable functional areas to assess level of performance, ensure adherence to applicable DOE directives and regulatory requirements, and evaluate the adequacy of the ongoing self-assessment program.

5.6.3 FACILITY Self-Assessments

FACILITY self-assessments must be conducted by various levels of the line organization who have responsibility for the functional area, process, or activity being assessed. These assessments must be conducted in accordance with approved procedures/guidelines and must ensure adherence to regulatory, operational, and administrative requirements.

(continued)

5.6 Reviews and Assessments

5.6.4 Unreviewed Safety Question (USQ) Process

The USQ process shall:

a. Be performed on proposed activities (including temporary modifications), reviewed, approved, and documented in accordance with an approved procedure.

b. Be approved by DOE prior to implementation of the proposed activity when a positive USQ is involved.

5.7 TSR and TSR Bases Control

5.7.1 Changes to the TSR and to the Bases shall be made under appropriate administrative controls and reviewed according to TSR Section 5.6. Proposed changes to the TSR and the TSR Bases shall be reviewed and approved by the DOE prior to implementation.

5.8 Procedures, Programs, and Manuals

5.8.1 Procedures

5.8.1.1 Scope

Written procedures shall be established, implemented, and maintained covering the following activities:

a. Operational activities
b. Maintenance activities (including corrective and preventive maintenance)
c. Emergency and abnormal operating procedures
d. Security plan implementation
e. Emergency plan implementation
f. Surveillances required by TSRs
g. Administrative aspects of FACILITY operation
h. Programs specified in Section 5.8.2
i. MODE changes

5.8.1.2 Review, Revision, and Approval

Procedures, and revisions thereto, shall be reviewed and approved in accordance with approved administrative procedures prior to implementation and reviewed periodically as set forth in administrative procedures.

5.8.1.3 Temporary Changes

Temporary changes to procedures may be made provided the change is documented and reviewed in accordance with approved administrative procedures.

(continued)

5.8.2 Programs and Manuals

The following programs shall be established, implemented, and maintained.

1. Radiological Protection Program
2. Emergency Response Program
3. Environmental Compliance Program
4. Industrial Hygiene Program
5. Critical Lift Program
6. Fire Protection Program
7. Installed Process Instrumentation (IPI), Measuring and Test Equipment (M&TE), and Other TSR Measuring Devices
8. Configuration Management Program
9. Preventive Maintenance Program
10. Nuclear Criticality Safety Program
11. Quality Assurance (QA) Program
12. Structural Integrity Program
13. Corrosion Control Program
14. Traffic Control Program
15. Waste Acceptance Criteria Program
16. Connector Installation Program
17. Chemical Inventory Control Program
18. HEPA Filter Program
19. Sludge Carryover Minimization Program
20. Software Control Program
21. Transfer Control Program
22. Flammable Vapor Sampling Program
23. Transfers from Waste Tank Annuli
24. Severe Weather Response
25. Evaporator Feed Qualification Program
26. 242-16H Evaporator Scale Evaluation
27. Flammability Control Program
28. Waste Tank Quiescent Time Program
29. Pump Run Program
30. Salt Dissolution/Interstitial Liquid Removal Program
31. Hydrogen Generation Rate Control
32. Waste Characterization System Control Program
33. Tank Top/Secondary Containment Loading Program
34. Not Used
35. Waste Tank Mixing Device Operation
36. Pump Tank Transfer Jet Control
37. Pump Tank Backup Ventilation Systems Program
38. Not Used
39. Event Response Program
40. Liquid Addition Program
41. ARM Location Program
42. 299-H Inventory Control Program
43. Prohibited Operations
44. Tank Fill Limits
45. Oil Control Program
46. Waste Box Control Program
47. Transfers to DWPF and Saltstone
48. Tank 48 Administrative Controls
49. Tank 48 Unauthorized Operations
50. Ventilation System Performance Monitoring
51. Inhalation Dose Potential Control
52. 242-16H Evaporator Chemical Cleaning
53. Chemical Cleaning Pump Tank Receipt Program

(continued)

5.8.2.1 Radiological Protection Program

Procedures for personnel radiological protection shall be prepared consistent with DOE requirements and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure. The radiological protection program shall ensure that the radiation exposure of onsite and offsite individuals is maintained within applicable DOE limits and is As Low As Reasonably Achievable. The program shall ensure that individual and collective radiation exposures are minimized.

5.8.2.2 Emergency Response Program

The facility specific annex to the Site Emergency Plan (SCD-7) shall define specific measures, policies, and actions to prevent or minimize injuries, damage to property, and impact on the environment caused by accidents, natural disasters, or deliberate damage within the area of responsibility.

The Facility Manager shall ensure that the facility specific annex to the Site Emergency Plan (SCD-7) is maintained in accordance with applicable DOE requirements, based on formal hazards assessment and requirements. The facility specific annex should contain the following elements at a minimum:

a. Emergency response organization
b. Operational emergency event classes
c. Notification
d. Consequence assessment
e. Protective actions
f. Medical support
g. Recovery and reentry
h. Emergency facility and equipment
i. Training
j. Drills and exercises
k. Program administration

5.8.2.3 Environmental Compliance Program

The site environmental compliance program shall comply with federal and state environmental regulations. The FACILITY shall follow site and FACILITY procedures governing the applicable environmental regulations.

(continued)

5.8.2.4 Industrial Hygiene Program

The industrial hygiene program shall serve to maintain employee exposures to chemical, physical, and biological hazards within safe levels. The FACILITY shall follow site and FACILITY procedures governing the applicable Industrial Hygiene regulations.

5.8.2.5 Critical Lift Program

A critical lift program for movement of loads over Safety Class or Safety Significant SSCs shall be implemented. This program shall ensure movement of loads over these locations is conducted in a manner that will minimize the potential of damaging safety related SSCs due to load drops. This program will include minimization of lifting heights, verification of load charts, lift stability, and verification of rigging.

5.8.2.6 Fire Protection Program

a. A fire protection program shall be established to minimize the following:
   1. Threats to the public health or welfare resulting from a fire
   2. Undue hazards to site personnel from a fire
b. The fire protection program shall address the following:
   1. Fire Prevention
      a) Fire-resistive construction
      b) Control of combustibles and combustible loading within and around PROCESS AREAS
      c) Control of ignition sources
      d) FACILITY inspections
      e) Handling of combustible or flammable materials
   2. Fire Control
      a) Automatic detection/suppression and alarm systems for designated buildings
      b) Fire Patrols/Watches (as necessary)
      c) Proper availability and maintenance of FACILITY firefighting equipment
      d) Identification of firefighting personnel, responsibilities, and training
      e) 24-hour firefighting coverage

(continued)

5.8.2.7 Installed Process Instrumentation (IPI), Measuring and Test Equipment (M&TE), and Other TSR Measuring Devices

a. IPI and M&TE shall be identified and programmatically controlled when used to monitor process variables (e.g., level, temperature) to comply with the requirements of the TSR and assumptions in the safety analysis.

b. Controls shall include the following:

1. Traceability of TSR-related instruments
2. Calibration frequencies for TSR-related instruments which can be calibrated
3. Evaluation of TSR-related items found outside of calibration tolerances

c. Equipment used as measuring devices to comply with the requirements of the TSR that are not part of the IPI or M&TE programs shall have the required capability/accuracy for performance of the specified requirement. This equipment shall also be within applicable calibration and preventative maintenance frequencies.

5.8.2.8 Configuration Management Program

A configuration management program shall be implemented that:

a. Identifies and documents the technical baseline of SSCs and computer software.

b. Ensures that changes to the technical baseline are properly developed, assessed, approved, issued, and implemented.

c. Maintains a system for recording, controlling, and indicating the status of technical baseline documentation on a current basis.

d. Controls the configuration of the SSCs specified in the Design Features section of this TSR to maintain their design function.

5.8.2.9 Preventive Maintenance Program

A preventive maintenance program shall be established and implemented to ensure that the FACILITY's SSCs are capable of performing their intended function.

(continued)

5.8.2.10 Nuclear Criticality Safety Program

The nuclear criticality safety program shall ensure the following requirements are met:

a. Nuclear Criticality Safety Evaluations (NCSEs) and/or Nuclear Criticality Safety Assessments (NCSAs) shall be the base documents for nuclear criticality control. Processes shall be shown to be subcritical under normal and credible abnormal operating conditions.

b. NCSEs/NCSAs shall be used to evaluate new processes, salt dissolution activities (e.g., dissolving salt / removing interstitial liquid), aluminum dissolution processing, or significant process changes that may adversely impact the characteristics of nuclear criticality safety.

c. NCSEs/NCSAs shall document the calculations and judgments used in determining that nuclear criticality safety is ensured.

5.8.2.11 Quality Assurance (QA) Program

The FACILITY QA program, through the site QA program, shall:

a. Require that sufficient records be maintained for activities affecting Safety Class and Safety Significant SSCs.

b. Support independent assessment, verification, and inspection requirements to ensure compliance with the QA program.

c. Provide for a graded approach to the application of QA requirements throughout the life of the FACILITY.

5.8.2.12 Structural Integrity Program

The structural integrity program shall define which of the Safety Class and Safety Significant SSCs identified in the Design Features section of this TSR require in-service inspection. This program shall provide reasonable assurance that the evidence of structural or functional degradation during services is detected to permit corrective action before the function of the SSC is compromised. The program shall determine those inspections / measurements that need to be performed on the SSCs to ensure that the SSCs will perform their intended design function under operational and accident conditions.

(continued)

5.8.2.13 Corrosion Control Program

Programmatic controls shall be implemented to ensure that waste chemistry and characteristics are controlled so that corrosion will not impact the ability of safety related equipment to perform its function when required. This program shall include, as a minimum, tank annulus ventilation operation and limits on pH, OH^-, NO_2^-, NO_3^-, SO_4^{-2}, and Cl^- as necessary to account for equipment corrosion. Periodic monitoring and sampling shall be performed consistent with ongoing activities associated with the safety related equipment. This program shall also address mixing requirements for waste tanks receiving CHEMICAL CLEANING TRANSFERS.

5.8.2.14 Traffic Control Program

Programmatic controls shall be implemented to ensure that vehicle movements are controlled near Safety Class or Safety Significant SSCs. These controls shall (as necessary) include the following:

a. Posted motor vehicle speed limits.

b. Locations of vehicle barriers to protect SSCs.

c. Limitations of vehicle traffic during critical evolutions.

5.8.2.15 Waste Acceptance Criteria Program (SAC)

The Waste Acceptance Criteria Program shall ensure that the composition of waste streams received into the FACILITY is within DSA analyzed limits. Waste streams received into the FACILITY shall comply with the inhalation dose potential, fissile material, organic concentration, heat generation rate, hydrogen generation rate limits, and maintain MCU as a Hazard Category 3 Facility. Waste streams not bounded by the analyzed isotopic and chemical inventory assumptions shall not be accepted unless a USQ review has been performed and approved.

Transfer of waste from CST Facilities to other facilities shall meet the receiving facility Safety Basis. If a proposed change impacts meeting the receiving facility's requirements, the receiving facility shall perform a USQ review (or equivalent, dependent upon facility categorization) to determine if the proposed change is within the receiving facility's Safety Basis and shall approve the change prior to implementing the proposed change.

(continued)

5.8.2.16 Connector Installation Program

Programmatic controls shall be implemented to ensure the proper installation of Safety Class or Safety Significant jumper connectors (e.g., Hanford, Grayloc®). The program shall specify the required controls for installation or tightening of jumper connectors.

5.8.2.17 Chemical Inventory Control Program

A chemical inventory control program shall be established. The program shall provide control over new materials brought into the FACILITY.

5.8.2.18 HEPA Filter Program

A program shall ensure replacement of HEPA filters (and associated roughing filters) prior to exceeding the assumed radiological loading associated with the HEPA filter.

5.8.2.19 Sludge Carryover Minimization Program (SAC)

Suction of transfer devices (pumps and jets) shall be a minimum of 24 inches from the sludge layer to minimize sludge entrainment during supernate transfers (including feeding the Evaporators).

Additional controls shall be implemented as necessary to minimize the amount of sludge solids carried over in supernate transfers based on evaluation of the following phenomena:

- Tank Agitation
- Effects of receiving WASTE TRANSFERS concurrent with an out-going transfer

5.8.2.20 Software Control Program

Software programming for safety related SSCs shall be controlled by a program which includes:

- Initiation by Design Change
- Implementation phase
- Load Procedures
- Software Validation
- Inservice Testing
- Access for Software Loads Controlled

(continued)

5.8.2.21 Transfer Control Program

A Transfer Control Program shall be established governing FACILITY initiated WASTE TRANSFERS and transfers into and out of Tank 50. The program shall at a minimum include the following attributes (only 5.8.2.21.c, e, f, h, and o apply to CONTINGENCY TRANSFERS; only 5.8.2.21.e, h, q, and r apply to transfers into and out of Tank 50):

a. Prior to TRANSFER INITIATION, determine the following: (SAC)

- Type of transfer (HIGH-REM WASTE TRANSFER, LOW-REM WASTE TRANSFER, or CHEMICAL CLEANING TRANSFER). F-Area Tank Farm SLUDGE SLURRY TRANSFERS shall be less than or equal to 16.7 wt% solids or have an inhalation dose potential that meets the LOW-REM WASTE TRANSFER criteria (as determined by engineering evaluation).
- TRANSFER PATH (including isolation points)
- LEAK DETECTION LOCATIONS for the TRANSFER PATH

b. SLUDGE SLURRY TRANSFERS out of Tanks 33 and 34 when the suction of the transfer device (pump or jet) is below the sludge layer shall be verified by sampling to meet the LOW-REM WASTE TRANSFER criteria. (SAC)

c. Monitoring and material balance requirements for WASTE TRANSFERS to detect transfer events shall be determined. The frequency and method (e.g., level/leak monitoring) of monitoring and material balances for a transfer and the required monitoring locations (including consideration of those past the first isolation point) shall be determined on an individual basis.

d. HDB-6, HDB-7, and HDB-8 ventilation system shall be operating while jetting sump contents. If the diversion box ventilation system becomes non-functional, the sump jet transfer shall be shut down immediately (secure steam/air) in the affected diversion box. (SAC)

e. Siphon, overpressure, and water hammer evaluations shall be performed (siphon evaluations do not apply to CONTINGENCY TRANSFERS or transfers into and out of Tank 50, except as required by Administrative Control 5.8.2.47.c).

f. Prior to TRANSFER INITIATION, independent verification of correct TRANSFER PATH alignment shall be completed. After initiating the transfer, use of correct motive force shall be independently verified.

(continued)

5.8.2.21 Transfer Control Program (continued)

g. Within 30 days of completing a SLUDGE SLURRY TRANSFER, a sufficient flush of the core pipe shall be performed such that the inhalation dose potential of any waste remaining in the core pipe is less than or equal to 9.8E+07 rem per gallon. (SAC)

h. Prior to TRANSFER INITIATION, procedures shall identify the functional equipment needed to stop transfers and siphons. (SAC)

i. Prior to TRANSFER INITIATION of a HIGH-REM WASTE TRANSFER, procedures shall identify two physically separated functional transfer isolation devices, each capable of stopping the transfer.

j. Prior to TRANSFER INITIATION of a HIGH-REM WASTE TRANSFER, verification of available waste tank space shall be performed.

k. Within 30 days of completing ESP SLUDGE SLURRY transfers, a three line volume flush of the core pipe shall be performed. (SAC)

l. ESP SLUDGE SLURRY shall only be transferred along the leak-checked paths shown in DSA Chapter 3, Figure 3.7-1. (SAC)

m. Prior to jetted TRANSFER INITIATION, independent verification of jet discharge path valves being open shall be completed (for jets with a 3-way valve, valve position will be in the discharge or receipt position, as applicable). (SAC)

n. Prior to jetted TRANSFER INITIATION from waste tanks where the possibility of core pipe pluggage due to salt precipitation exists, a sufficient flush (or drain) to prevent pluggage of the core pipe shall have been completed. Flushing is not required for subsequent jetted TRANSFER INITIATION if the suspension time is within the requirements of the engineering evaluation. (SAC)

o. ACTUAL MISSING WASTE shall be less than or equal to 5,000 gallons. If ACTUAL MISSING WASTE is greater than 5,000 gallons, then the affected WASTE TRANSFERS shall be terminated immediately. (SAC)

p. Material balance discrepancies shall be less than or equal to 15,000 gallons. If material balance discrepancies are greater than 15,000 gallons, then the affected WASTE TRANSFERS shall be terminated immediately. (SAC)

q. Prior to TRANSFER INITIATION through HDB-7, isolation shall be established in HDB-7 to preclude waste from entering the Tank 50 Valve Box except during intended transfers from HDB-7 through the Tank 50 Valve Box. (SAC)

(continued)

5.8.2.21 Transfer Control Program (continued)

r. Prior to TRANSFER INITIATION from Tank 50, isolation shall be established in the Tank 50 Valve Box to preclude Tank 50 material from entering HDB-7 and HDB-8 (via ETP Diversion Box). (SAC)

s. The TRANSFER PATH for CHEMICAL CLEANING TRANSFERS, and vent and drain operations associated with CHEMICAL CLEANING TRANSFERS, shall only be permitted through the following LEAK DETECTION LOCATIONS: FDB-2, FDB-3, FDB-4, FPP-1, FPP-2, Valve Boxes 1 through 5, and Valve Box LDB-17. (SAC)

t. Prior to TRANSFER INITIATION of a CHEMICAL CLEANING TRANSFER, isolation (single leak-tested valve, double valve isolation, or blank) shall be established to preclude CHEMICAL CLEANING TRANSFERS from entering pump tanks, except as allowed by Administrative Control 5.8.2.53, or waste tanks outside of the intended TRANSFER PATH. (SAC)

u. During CHEMICAL CLEANING TRANSFERS, acidic waste material from the vent and drain operation shall only be permitted to FPT-1 and the tank associated with the vent/drain path.

5.8.2.22 Flammable Vapor Sampling Program

Programmatic controls shall be established governing vapor space hydrogen sampling of the transfer line jackets and encasements. Vapor space sampling is required:

- prior to TRANSFER INITIATION and following each WASTE TRANSFER of material with an inhalation dose potential greater than 9.8E+07 rem/gallon (for transfer line jackets), and
- prior to TRANSFER INITIATION and following each WASTE TRANSFER (for the encasements) through the associated transfer line, as specified by the program.

The program shall establish the sampling frequency, location and type of sample, as well as the number of samples that is considered adequate to ensure that waste has not leaked into the jacket/encasement. The program shall also determine when actions are necessary (in addition to the method of action) to prevent the vapor space from becoming flammable.

Programmatic controls shall be established governing flammable vapor sampling of Type IIIA waste tank underliner sumps and Type IV tank leak detection sumps. The program shall ensure that these locations are sampled for flammable vapors at least once per year and shall determine/identify any actions to be taken should high flammable vapor conditions exist.

(continued)

5.8.2.23 Transfers from Waste Tank Annuli (SAC)

Prior to TRANSFER INITIATION of waste from a waste tank annulus via a jetted transfer (steam or air), a negative pressure ventilation system with HEPA filter shall be installed and operating.

5.8.2.24 Severe Weather Response

a. Upon receipt of a Tornado Warning, Tornado Watch, or High Wind Warning issued by the Savannah River Site Operations Center for CST Facilities, the following actions shall occur: (SAC)

- Secure transfers (except evaporator Gravity Drain Line [GDL] flushes, in-progress pot lifts/pump-outs [unless the evaporator lift/pump-out is associated with an exposed GDL as a result of an excavation], and in-progress pot siphons)
- Shut down evaporators (secure feed and steam to tube bundles and lances)
- Secure waste tank mixing device/pump tank mixing operations (shut down and secure power to SMPs)
- Secure interstitial liquid removal and BULK SALT DISSOLUTION activities
- Suspend critical lift activities and large liquid additions (i.e., rewetting activities) associated with a dry sludge tank
- Secure mechanical cleaning operations associated with Type IV waste tanks (i.e., high pressure lancing operations, high pressure eductor transfers, crawler operations)

b. During freezing conditions, programmatic controls shall be implemented to ensure Safety Class and Safety Significant equipment remains functional. The intent of this program is to supplement (not supersede) other requirements on safety-related equipment. Affected equipment may be removed from service with appropriate compensatory measures (i.e., enter applicable LCO) in lieu of meeting applicable severe weather controls.

(continued)

5.8.2.25 Evaporator Feed Qualification Program

The Evaporator Feed Qualification Program shall ensure that the composition of waste streams received into the 242-16F, 242-16H, and 242-25H Evaporator feed tanks is within DSA analyzed limits. The composition of waste in the 242-16F, 242-16H, and 242-25H Evaporator feed tanks shall comply with the inhalation dose potential and hydrogen generation rate limits prior to transfer to the evaporator pot. (SAC)

Waste tanks containing Defense Waste Processing Facility (DWPF) Recycle (or similar waste) shall have a pre-transfer evaluation performed against Criteria a.1 through a.5 prior to transfers to the 242-16F or 242-25H Evaporator systems. (SAC)

a. The program shall contain the attributes listed below to preclude unacceptable uranium bearing/hydrogen producing solids (scale) formation within the 242-16F and 242-25H Evaporators. Criteria a.1 through a.5 intentionally allows both the silicon concentration and the calculated solids formation rate for the 242-16F/242-25H Evaporator systems to slowly increase over time. This limited rate of increase in the historical operating range of these evaporator systems is acceptable as long as no solids accumulation in the evaporator pots is experienced.

a.1 The average concentration of silicon in the process stream transferred to the evaporator system shall be less than 120% of the historical maximum silicon concentration for feed to the affected evaporator. Prior to determining the historical maximum silicon concentration, it must be verified that scale formation has not occurred during the operating period.

a.2 The calculated sodium aluminosilicate formation rate from the combined transfers and the evaporator tank waste shall be less than 110% of the historical maximum formation rate for feed to the affected evaporator. For the analyses verifying that this attribute is met, it is assumed that the transferred volume mixes with the feed and/or drop tank supernate and the mixture is fed to the evaporator. These analyses also assume a concentration factor of three for the evaporator.

a.3 For transfers directly into the evaporator feed tank, the free hydroxide concentration of the transferred waste shall be greater than 1 molar. Small volumes (i.e., <10,000 gallons) of transfer wastes with free hydroxide concentrations less than or equal to 1 molar that meet attributes a.1 and a.2 may be made into the evaporator feed tank if:

- feed to the evaporator is stopped prior to initiation of the transfer, and
- feed is not restarted until at least 24 hours after the transfer is complete.

(continued)

5.8.2.25 Evaporator Feed Qualification Program (continued)

a.4 For DWPF Recycle (or similar waste) transfers into the evaporator drop tank, if the free hydroxide concentration is less than or equal to 1 molar, then the following requirements shall be met:

a.4.1 The combined contents must be greater than 1 molar free hydroxide (based on calculation) prior to transfer to the feed tank.

a.4.2 Recycle transfers from the drop tank to the feed tank shall be stopped prior to receipt of a low hydroxide transfer. Subsequent recycle transfers shall not be initiated until completion of the low hydroxide DWPF Recycle (or similar waste) transfer and the conditions of attribute a.4.3 are satisfied.

a.4.3 In addition to a.4.1 and a.4.2 above, at least one of the following three conditions must be met:

a.4.3.a Prior to receiving a low hydroxide DWPF Recycle (or similar waste) transfer, the waste level shall be greater than or equal to 120 inches above the downcomer discharge and the drop tank hydroxide concentration shall be greater than or equal to 4 molar.

a.4.3.b After receipt of a low hydroxide DWPF Recycle (or similar waste) transfer and prior to the first subsequent recycle transfer from the drop tank to the feed tank, a supernate sample from the surface of the drop tank shall indicate greater than 1 molar hydroxide concentration.

a.4.3.c After receipt of a low hydroxide DWPF Recycle (or similar waste) transfer and prior to the first subsequent recycle transfer from the drop tank to the feed tank, the affected evaporator shall be operated for a sufficient duration to lift 100,000 gallons of evaporator bottoms to the drop tank.

a.5 A pre-transfer evaluation shall be performed to verify that the tank jet/pump suction is positioned to minimize the disturbance and entrainment of waste from within the unsettled transition layer above the solids/supernate interface which may contain high concentrations of aluminum, iron, silicon, uranium, and manganese.

(continued)

5.8.2.25 Evaporator Feed Qualification Program (continued)

a.6 If a transfer of DWPF Recycle (or similar waste) into the 242-16F or 242-25H Evaporator systems did not meet one or more of the above requirements (a.1 through a.5), then the affected evaporator shall be shut down immediately and not restarted until an engineering evaluation of the evaporator system status is completed and approved by the FOSC and DOE. (SAC)

b. An engineering evaluation shall be performed prior to any activities that may distribute DWPF Recycle (or similar waste) to locations that do not contain DWPF Recycle (or similar waste).

c. The silicon concentration and sodium aluminosilicate formation rate for the 242-16F and 242-25H Evaporator systems shall be determined at least once every six months based on sampling of the feed and drop tanks. Samples shall be drawn from multiple tank elevations. The specified frequency is met if this attribute is performed within the 25% interval extension allowance.

d. Periodic visual inspections of the accessible internal surfaces of the 242-16F and 242-25H Evaporator pots (including evaluation/documentation of the inspection results) shall be performed as follows: (SAC)

d.1 Inspect at least once every 2160 hours (90 days) of evaporator operation, or

d.2 If a satisfactory evaporator pot siphon is performed every 720 hours (30 days) of evaporator operation, then inspect at least once every 4320 hours (180 days) of evaporator operation. If siphon flowrate is less than the established baseline, then prior to subsequent evaporator operation a satisfactory siphon must be performed.

d.3 If inspection results indicate unacceptable accumulation of solids/scale, then waste feed to the affected evaporator shall be shut down immediately and not restarted until an engineering evaluation of the evaporator system status is completed and approved by the FOSC and DOE.

(continued)

5.8.2.26 242-16H Evaporator Scale Evaluation (SAC)

The 242-16H Evaporator shall be inspected (including evaluation/documentation of the inspection results) at least once every 4320 hours (180 days) of evaporator operation for the presence of scale. If inspection results indicate a total volume of accumulated scale greater than 200 gallons, waste feed to the evaporator shall be shut down immediately and not restarted until the scale volume is reduced below limits or an engineering evaluation of the evaporator system status is completed and approved by the FOSC and DOE.

5.8.2.27 Flammability Control Program

a. Engineering, using the flammable vapor release methodology of the DSA, shall perform the following: (SAC)

- Determine the hydrogen concentration safety analysis limit for waste tanks
- Determine and track the time to LFL (CLFL for Tank 50) for waste tanks
- Ensure that it takes a minimum of 7 days upon loss of waste tank forced ventilation for any tank bulk vapor space to increase from the safety analysis limit to 100% of the LFL (CLFL for Tank 50)
- Identify the waste tanks which, due to seismic release of trapped gas, will become flammable in less than 7 days
- Ensure that only 7 waste tanks can become flammable in less than 24 hours following a seismic event
- Ensure that only 14 waste tanks can become flammable in less than 7 days following a seismic event

b. Engineering shall determine the waste tank hydrogen concentration LFL limit and document the value in the ERD (N-ESR-G-00001). The hydrogen concentration value stated in the ERD shall account for corrosion induced hydrogen generation (CHEMICAL CLEANING MODE only), potential organics, and instrument uncertainties. (SAC)

c. Programmatic controls shall be established to ensure a path forward is provided to DOE (addressing the additional risk and recovery time) if a transfer required to mitigate a tank leak causes additional tanks to have the potential to become flammable in less than 7 days following a seismic event. Submittal of the path forward is not required prior to initiating the transfer.

(continued)

5.8.2.28 Waste Tank Quiescent Time Program (SAC)

Waste tank mixing devices shall be periodically operated to limit the amount of trapped gas that could be released during a seismic event, such that the waste tank does not become flammable in less than 7 days following a seismic event. These controls shall be applicable to a waste tank following the initial depletion of trapped gas from the waste as a result of mixing operations.

5.8.2.29 Pump Run Program (SAC)

a. Prior to initiating sludge agitation using waste tank mixing devices, the waste tank bulk vapor space shall be ventilated for an adequate number of turnovers to reduce hydrogen concentration from the safety analysis limit to less than or equal to the initial value assumed in the hydrogen release engineering evaluation or hydrogen concentration shall be verified to be less than or equal to the initial value assumed in the hydrogen release engineering evaluation. The methodology used to determine the adequate number of vapor space changes and/or the hydrogen concentration shall be consistent with the requirements of Chapter 5 of the DSA.

b. When a waste tank is in GAS RELEASE MODE, the operation of waste tank mixing devices shall not result in exceeding the hydrogen concentration safety analysis limit.

5.8.2.30 Salt Dissolution/Interstitial Liquid Removal Program (SAC)

a. Prior to initiating BULK SALT DISSOLUTION / interstitial liquid removal, the waste tank bulk vapor space shall be ventilated for an adequate number of turnovers to reduce hydrogen concentration from the safety analysis limit to less than or equal to the initial value assumed in the hydrogen release engineering evaluation or hydrogen concentration shall be verified to be less than or equal to the initial value assumed in the hydrogen release engineering evaluation. The methodology used to determine the adequate number of vapor space changes and/or the hydrogen concentration shall be consistent with the requirements of Chapter 5 of the DSA.

b. When a waste tank is in GAS RELEASE MODE, the rate at which salt is dissolved or interstitial liquid is removed from saltcake shall not result in exceeding the hydrogen concentration safety analysis limit.

5.8.2.31 Hydrogen Generation Rate Control (SAC)

Waste in the FACILITY shall be within the bounding hydrogen generation rates used in the safety analysis for the applicable locations.

(continued)

5.8.2.32 Waste Characterization System Control Program

Programmatic controls shall be established for the Waste Characterization System. The program shall address data acquisition, data entry, and quality assurance.

5.8.2.33 Tank Top/Secondary Containment Loading Program

Programmatic controls shall be implemented to ensure temporary and new installation of loads on tank tops and secondary containments do not compromise the ability of the structures to perform their intended safety function.

5.8.2.34 Not Used

5.8.2.35 Waste Tank Mixing Device Operation (SAC)

a. Waste tank mixing device operation in Type I, II, III, and IIIA waste tanks shall be controlled (i.e., mixing device discharge sufficiently below the waste surface for a given mixing device speed) such that the operation does not result in waste aerosolization (e.g., rooster tailing) during these activities.

b. The SMP shall be operated at or below 500 rpm while an external water source is connected to the SMP. This speed (less than or equal to 500 rpm) shall be verified by manually reducing the speed at the VFD until the speed is at or below 500 rpm. This shall be independently verified prior to connecting an external water source to the pump. When the SMP is operating and an external water source is connected, an operator shall be stationed at the VFD to verify that the VFD speed is not altered or a physical barrier shall be installed which prevents VFD speed changes.

5.8.2.36 Pump Tank Transfer Jet Control (SAC)

Pump tank transfer jets shall be manually isolated from steam and air while not in use.

5.8.2.37 Pump Tank Backup Ventilation Systems Program (SAC)

Prior to TRANSFER INITIATION, backup portable ventilation with portable generator shall be installed and functional for pump tanks which are receiving jetted transfers from a source of greater than 1200 gallons (excluding HDB-8 Complex pump tanks and pump tanks receiving canyon transfers). These systems shall be tested and maintained to ensure they can perform their safety function when required. If the backup portable ventilation system becomes non-functional while the pump tank is receiving a transfer, then the transfer shall be terminated immediately.

(continued)

5.8.2.38 Not Used

5.8.2.39 Event Response Program (SAC)

Controls shall be implemented which direct the event response activities and maintain equipment to place the FACILITY in a safe condition. These controls shall include the procedures and operator actions required by the safety analysis as stated below.

a. Following a waste tank siphon/pump-out event from the Chromate Cooling Water System:

- Close waste tank Chromate Cooling Water header isolation valves (Tanks 25 through 28 and Tanks 36 through 51)
- Close Tank 30 Chromate Cooling Water coil isolation valves

b. Following a seismic event:

- Terminate transfers (excluding evaporator GDL flushes and in-progress pot siphons/lifts/pump-outs)
- Shut down evaporators (secure steam/air to tube bundles and lances)
- Secure tank agitation/BULK SALT DISSOLUTION/interstitial liquid removal activities
- Install and operate portable ventilation systems on waste tanks, prioritized on a time to LFL (CLFL for Tank 50) basis
- Perform manual hydrogen monitoring of the waste tanks (excluding Tank 50) that are under the Waste Tank Quiescent Time Program upon loss of waste tank ventilation
- Close waste tank Chromate Cooling Water header isolation valves upon identification of a Chromate Cooling Water System boundary break in the waste tank (Tanks 25 through 29 and Tanks 31 through 51)
- Close Tank 30 Chromate Cooling Water coil isolation valves upon identification of a Chromate Cooling Water System boundary break in the waste tank
- Verify HDB-8 PVV system suction damper position alignment to prevent bypass flow conditions associated with an open suction damper on the idle exhaust fan in response to a loss of offsite power
- Secure power to the SMPs
- Restore ventilation or operate backup ventilation on pump tanks receiving jetted transfers from a source of greater than 1200 gallons (excluding HDB-8 Complex pump tanks and pump tanks receiving canyon transfers)

(continued)

5.8.2.39 Event Response Program (SAC) (continued)

c. Following a Loss of Power event:

- Terminate pump tank transfers and agitation
- Verify HDB-8 PVV system suction damper position alignment to prevent bypass flow conditions associated with an open suction damper on the idle exhaust fan
- Terminate Tank 50 mixing devices

d. Following a Wildland fire event:

- Terminate transfers (including evaporator operation) and secure tank agitation/BULK SALT DISSOLUTION/interstitial liquid removal activities

e. Following a control room abandonment event:

- Terminate transfers (including evaporator operation) and secure tank agitation/BULK SALT DISSOLUTION/interstitial liquid removal activities associated with the evacuated control room

5.8.2.40 Liquid Addition Program (SAC)

Planned liquid additions to dry sludge tanks shall be controlled to minimize the potential for release of dry sludge materials. The program shall include establishing and maintaining operating limits as necessary. Procedures shall also include verification that active filtered ventilation is in place prior to large liquid additions to Tank 15.

(continued)

5.8.2.41 ARM Location Program

Programmatic controls shall be implemented during the following to ensure the placement of ARMs for radiological release detection purposes.

- HIGH-REM WASTE TRANSFERS for above-ground waste transfer lines, including excavated transfer lines
- SMP operation
- Waste tank chemical cleaning during waste tank mixing device operations
- Waste tank mechanical cleaning during crawler lancing device operations from pressure sources greater than 10,000 psi

The program shall also determine the alarm requirements (e.g., control room alarm or local alarm and operator/control room two-way communication) for each ARM. The ARMs shall comply with LCO 3.7.9 during HIGH-REM WASTE TRANSFERS through above-ground waste transfer lines or LCO 3.8.11 during SMP operation, waste tank chemical cleaning (during waste tank mixing device operations), or waste tank mechanical cleaning (during crawler lancing device operations from pressure sources greater than 10,000 psi).

5.8.2.42 299-H Inventory Control Program (SAC)

299-H radioactive isotope inventory shall be less than the Hazard Category 3 limits.

5.8.2.43 Prohibited Operations (SAC)

(See 5.8.2.49 for Tank 48 Unauthorized Operations):

a. Additions of waste into or WASTE TRANSFERS through the following inactive locations are prohibited. WASTE TRANSFERS through transfer lines for which these inactive locations are receipt vessels or LEAK DETECTION LOCATIONS are also prohibited.

FDB-1	HPP-1
FDB-5	Tank 16
FDB-6	F-Area Catch Tank
HDB-1	242-F Evaporator
HDB-3	242-H Evaporator
	F- and H-Area CTSs

(continued)

5.8.2.43 Prohibited Operations (SAC) (continued)

b. WASTE TRANSFERS through the following transfer lines are prohibited:

FL-241-917-WTS-L-7	FM-241-927-WTS-L-1054
FL-241-920-WTS-L-8	HL-241-913-WTS-L-451
FL-241-933-WTS-L-3260	HL-241-914-WTS-L-103
FL-641-000-WTS-L-107-DB2	HL-241-916-WTS-L-20E
FM-241-926-WTS-L-960	HI-241-948-WTS-L-1151A
FM-241-927-WTS-L-1013	HI-241-948-WTS-L-1152A

c. SLUDGE SLURRY TRANSFERS into Tank 49 are prohibited.

d. Not Used

e. Simultaneous SLUDGE SLURRY TRANSFERS through two or more core pipes contained within the same jacket/encasement are prohibited.

f. Steam jet transfers of waste with a radiolytic hydrogen generation rate greater than 9.6E-6 ft^3/hour-gallon through the following transfer lines/jumpers are prohibited:

- Transfer lines for which diversion boxes or pump pits are credited LEAK DETECTION LOCATIONS.
- Evaporator cell transfer jumpers (i.e., jumpers configured for tank-to-tank transfers through the cell that bypass the evaporator pot).

g. HIGH-REM WASTE TRANSFERS into F-Area Tank Farm are prohibited, except for the HPFP. Valves within the HPFP are allowed to be used as isolation valves for the TRANSFER PATH of a HIGH-REM WASTE TRANSFER.

h. HIGH-REM WASTE TRANSFERS through transfer lines for which clean-out ports are credited LEAK DETECTION LOCATIONS are prohibited.

i. WASTE TRANSFERS through 242-16H and 242-16F Evaporator Cell transfer jumpers with an inhalation dose potential greater than 9.8E+7 rem/gallon are prohibited.

j. Not Used

(continued)

5.8.2.43 Prohibited Operations (SAC) (continued)

k. WASTE TRANSFERS associated with free supernate removal from a Type III/IIIA waste tank classified as a SLOW GENERATION TANK are prohibited during the following conditions:

- Salt tank with an equivalent salt inventory greater than 330 inches.
- Settled sludge tank with a sludge inventory greater than 250 inches.

l. WASTE TRANSFERS associated with free supernate removal from a waste tank classified as a VERY SLOW GENERATION TANK are prohibited during the following conditions:

- Salt tank with an equivalent salt inventory greater than 150 inches.
- Settled sludge tank with a sludge inventory greater than 80 inches.

m. The only waste tanks permitted to be classified as an ESP SLUDGE SLURRY WASTE TANK are Tanks 40 and 51; other waste tanks are prohibited from being classified as an ESP SLUDGE SLURRY WASTE TANK.

n. Steam jet transfers into an ESP SLUDGE SLURRY WASTE TANK or Tank 50 are prohibited.

o. HIGH-REM WASTE TRANSFERS through 241-96H Valve Box are prohibited.

p. The 241-96H Valve Box is prohibited from being a LEAK DETECTION LOCATION for HIGH-REM WASTE TRANSFERS.

q. SMP operation in Type IV waste tanks and Tank 50 is prohibited.

r. Mixing device operation in Tank 39 is prohibited.

s. SLUDGE SLURRY TRANSFERS out of Tanks 32 and 35 are prohibited.

t. Creation of a dry sludge tank (other than Tank 15, which is considered a dry sludge tank) is prohibited.

u. Transfers through the Tank 50 Valve Box and through receipt transfer lines into Tank 50 with an inhalation dose potential greater than 2.09E+5 rem/gallon are prohibited.

v. Sludge agitation, bulk salt dissolution, and interstitial liquid removal activities in Tank 50 that could exceed the Tank 50 gas release criteria as described in DSA Chapter 3 are prohibited.

(continued)

5.8.2.44 Tank Fill Limits (SAC)

Engineering shall determine the waste tank fill limit for each waste tank and document the values in the ERD (N-ESR-G-00001). The values stated in the ERD shall account for instrument uncertainties (excluding acidic spray washing fill limits) and the maximum volume associated with a transfer error event.

5.8.2.45 Oil Control Program

Programmatic controls shall be established to prevent the introduction (e.g., via air compressors, mechanical cleaning equipment) of significant flammable vapors from lubricating or hydraulic oil into analyzed spaces (e.g., evaporator pots, evaporator cells, transfer facilities, waste tanks, waste tank annuli).

5.8.2.46 Waste Box Control Program

Programmatic controls shall be established to maintain the waste box inventory within transportation limits.

5.8.2.47 Transfers to DWPF and Saltstone

a. To preclude potential accident scenarios in DWPF associated with transfers from waste tanks (Tanks 40 and 49) to DWPF, controls shall be implemented as follows:

a.1 Provide independent verification that applicable waste transfer pumps are stopped when transfers to DWPF are terminated (not applicable to the flushwater pump).

a.2 Isolate and vent the transfer route to terminate the siphon if double valve isolation of the transfer route from the supply tank to the receipt facility cannot be achieved when WASTE TRANSFERS to DWPF are terminated (not applicable to line flushing and draining). (SAC)

a.3 Ensure that the applicable CST Control Room and the receipt facility operators are in constant communication whenever a waste transfer system valve lineup allows a transfer and an applicable waste transfer pump or flush water pump is energized.

(continued)

5.8.2.47 Transfers to DWPF and Saltstone (continued)

a.4 Ensure upon a transfer termination, that a CST instrument will monitor the supply tank level to sound an alarm if the tank level drops unexpectedly. This CST instrument does not have to be qualified for post-seismic or post-tornado operation. Upon discovery that the CST instrument is unavailable to perform this level monitoring, operators will initiate activities to perform steel taping of the supply tank level on a priority basis consistent with any ongoing emergency response activities.

a.5 Ensure during a tornado/high wind warning, following a tornado/high wind event, or following an earthquake, that the following actions are performed:

a.5.1 Transfers are terminated and a siphon break established by providing double valve isolation of or isolating and venting the transfer route. (SAC)

a.5.2 Independent verification that the applicable waste transfer pumps are stopped.

b. To preclude the potential for a siphon from Tank 49 during transfers from 241-96H to 512-S, controls shall be implemented as follows:

b.1 Prior to TRANSFER INITIATION, isolation (double valve isolation, single valve isolation with a vent path, blank, or jumper removed) shall be established. (SAC)

b.2 Prior to TRANSFER INITIATION, independent verification of correct transfer path alignment shall be completed.

(continued)

5.8.2.47 Transfers to DWPF and Saltstone (continued)

c. In addition to meeting the Waste Acceptance Criteria requirements for the Saltstone Facility, the following controls shall be implemented for transfers to Saltstone to preclude potential accident scenarios (controls stated in the Transfer Control Program also apply to Saltstone transfers):

c.1 Monitoring and material balance requirements to detect transfer events shall be determined. The frequency and method (e.g., level/leak monitoring) of monitoring and material balances for a transfer and the required monitoring locations (including those past the first isolation point) shall be determined on an individual basis.

c.2 Siphon evaluations shall be performed.

c.3 Prior to TRANSFER INITIATION, independent verification of correct transfer alignment shall be completed. After initiating the transfer, use of correct motive force shall be independently verified.

c.4 Prior to TRANSFER INITIATION, procedures shall identify the functional equipment needed to stop transfers and siphons. (SAC)

c.5 Isolate the transfer route when transfers to Saltstone are terminated. (SAC)

c.6 Material balance discrepancies shall be less than or equal to 15,000 gallons. If material balance discrepancies are greater than 15,000 gallons, then the affected transfers shall be terminated immediately. (SAC)

c.7 Procedures shall specify communication protocol during transfers.

(continued)

5.8.2.48 Tank 48 Administrative Controls

The following controls apply to Tank 48:

a. When the ventilation system is in NON-INERTED OPERATION, the minimum amount of time to increase to 100% of the CLFL, assuming the loss of the ventilation system and assuming a starting point of 37% CLFL, must be 9 days or longer. (SAC)

b. Liquid additions must be demonstrated to be acceptable in ventilation Mode B prior to making these additions in NON-INERTED OPERATION or ventilation Mode C operations. This means that planned water additions for these modes will be done twice. Prior to adding water in NON-INERTED OPERATION or adding water in ventilation Mode C, a water addition of equal or greater volume and rate and in a similar manner as that proposed in NON-INERTED OPERATION or ventilation Mode C operations will be made in ventilation Mode B. The resulting benzene release from the ventilation Mode B addition will be analyzed by Engineering to determine whether, without ventilation, this release complies with the 18 day-to-CLFL requirement at the liquid/vapor interface using the actual starting point concentration. If the analysis shows it would take longer than 18 days to reach this condition, the addition will be allowed during NON-INERTED OPERATION or ventilation Mode C operations. (SAC)

c. When no ventilation exists, and an LCO Required Action applies that requires liquid transfers be terminated, and the LCO does not explicitly permit liquid additions in accordance with this administrative control, liquid additions are not permitted (e.g., % CLFL is greater than LCO requirement, inoperable HLLCP). When no ventilation exists, liquid additions will be limited to those required to perform the following: filling of the seal leg in the purge condenser, condenser / demister flushing, and flushing of the reheater. Any other water additions will be allowed only after the satisfactory completion of a USQ determination. (SAC)

d. Slurry pumps shall be periodically operated to control the flammable vapor inventory in the tank, such that the waste tank bulk vapor space does not become flammable in less than 9 days following a seismic event. (SAC)

e. The determination of benzene release rates, required by controls within the TSR, shall address instrumentation uncertainty of the parameters used as input to the calculations. (SAC)

(continued)

5.8.2.48 Tank 48 Administrative Controls (continued)

f. Controls shall be implemented to ensure that: (i) the waste temperature is monitored and maintained less than or equal to 35°C, and (ii) the free hydroxide concentration of the waste is monitored and maintained greater than or equal to 1.0 molar. If waste temperature is greater than 35°C, then maximum cooling with all available cooling coils shall be initiated immediately and the temperature restored to limits within 48 hours. If free hydroxide concentration of the waste is less than 1.0 molar, then free hydroxide concentration shall be restored to limits within 14 days. (SAC)

g. During slurry pump operations, controls shall ensure that the following conditions are met (if a condition is not met, then slurry pump operation shall be secured immediately):

- The tank shall not be in NON-INERTED OPERATION and the tank ventilation system shall be in Mode B. (SAC)
- A gas chromatograph (GC) shall be functional (calibrated within 7 days prior to the start of slurry pumps and every 7 days during pump operations). The GC provides an early indication of the benzene concentration rate of change in the tank vapor space. To support a GC outage for maintenance (e.g., change operating mode, start new data files, change GC filter and pump), the GC may be taken out of service for up to two (2) hours out of a 24 hour period if the following are met: (SAC)
  - The flammable vapor concentration is less than 20% of the CLFL.
  - The CLFL analyzer is OPERABLE prior to starting the outage.
  - Benzene concentration in the vapor space has not increased by more than 0.5% CLFL (~ 67 ppm benzene) over the previous 6 hours or is trending downward.
  - Evolutions planned/completed during the time the GC is out of service will not increase the benzene release rate from the tank liquid to the vapor space.
- Slurry pump operation shall be secured immediately if the benzene concentration is equal to or greater than 3,000 ppm. (SAC)
- The GC sample elevation shall be determined based on the rate of change of benzene evolution, i.e., as close to the liquid surface as practical. Other sample locations may be used to measure benzene after the release rate has stabilized.

h. Not Used

(continued)

5.8.2.48 Tank 48 Administrative Controls (continued)

i. Programmatic controls shall be implemented to ensure that the conservation vent and vacuum breaker is periodically inspected. This inspection shall ensure that blockage in the relief line is not present and that the conservation vent and vacuum breaker operate as designed.

j. Programmatic controls shall be implemented to ensure that sources of ignition are minimized for Tank 48.

k. Controls shall be implemented for independent verification of chemicals prior to unloading to Tank 48. (SAC)

l. Programmatic controls shall be implemented to ensure the outer primary tank wall for Tank 48 is inspected annually.

5.8.2.49 Tank 48 Unauthorized Operations (SAC)

Controls shall be implemented to ensure the following operations are not permitted:

a. Chemical cleaning, including oxalic acid additions to Tank 48

b. Deliveries, storage, or further use of sodium tetraphenylborate (STPB) in the FACILITY (excluding incidental samples: however, these samples shall not be disposed of in waste tanks).

c. Not Used

d. Processing operations (concentration / washing) in Tank 48

e. Waste additions/transfers to or from Tank 48.

f. Use of the Cold Feeds Area to Tank 48 Chemical Addition line.

g. SMP operation in Tank 48.

5.8.2.50 Ventilation System Performance Monitoring (SAC)

Ventilation system performance monitoring shall be performed as necessary to ensure that the HEPA filter is operating properly, and capable of performing its credited function, during evolutions specified in Table 5.8.2-1. Monitoring shall be performed prior to beginning the applicable evolutions and periodically thereafter. The availability of equipment to remove moisture and condition the exhaust flow before passing through the HEPA filter shall be considered when determining the parameters monitored and frequency of monitoring.

(continued)

5.8.2.50 Ventilation System Performance Monitoring (SAC) (continued)

Table 5.8.2-1
HEPA Filter Monitoring Requirements

Evolution	Performance Monitoring Required	Monitored Parameters
HIGH-REM WASTE TRANSFER through a Type I or II tank annulus	During the evolution if the annulus ventilation system is operating	Exhaust HEPA filter differential pressure or annulus pressure, and downstream airborne activity
Air or steam jet transfer from a pump tank	While air or steam is aligned to the jet	Exhaust HEPA filter differential pressure and downstream airborne activity (1)
Air or steam jet transfer from a pump pit sump	While air or steam is aligned to the jet	Exhaust HEPA filter differential pressure and downstream airborne activity (1)
Air or steam jet transfer from a diversion box sump (applies only to HDB-6, HDB-7, and HDB-8)	While air or steam is aligned to the jet	Exhaust HEPA filter differential pressure and downstream airborne activity (1)
Air or steam jet transfer from a waste tank	While air or steam is aligned to the jet	Exhaust HEPA filter differential pressure and downstream airborne activity (1)
Operating a crawler lancing device in a waste tank from pressure sources > 10,000 psi	During the evolution	Exhaust HEPA filter differential pressure and downstream airborne activity (1)
Air or steam jet transfer from a waste tank annulus	While air or steam is aligned to the jet	Exhaust HEPA filter differential pressure and downstream airborne activity
Operating waste tank mixing devices in a Type I, II, III, or IIIA tank	While mixing device is operating	Exhaust HEPA filter differential pressure and downstream airborne activity (1)
ADMP operation	While ADMP air column is pressurized	Exhaust HEPA filter differential pressure and downstream airborne activity (1)

(continued)

5.8.2.50 Ventilation System Performance Monitoring (SAC) (continued)

Table 5.8.2-1 (continued)
HEPA Filter Monitoring Requirements

Evolution	Performance Monitoring Required	Monitored Parameters
Pulse tube agitator operation	During the evolution	Exhaust HEPA filter differential pressure and downstream airborne activity (1)
Large liquid addition into Tank 15	During the evolution	Exhaust HEPA filter differential pressure and downstream airborne activity (1)

Footnotes:
(1) Downstream airborne activity monitoring is only required if the ventilation system condenser or reheater is not in service or is non-functional.

5.8.2.51 Inhalation Dose Potential Control (SAC)

The inhalation dose potentials shall be within the values analyzed in the DSA.

5.8.2.52 242-16H Evaporator Chemical Cleaning (SAC)

The following controls shall be implemented during chemical cleaning of the 242-16H Evaporator:

a. Prior to adding acid to the evaporator vessel and while the vessel contains acidic material (i.e., pH less than 7.0), double valve isolation shall be established between the evaporator vessel and the evaporator drop tank.

b. Prior to TRANSFER INITIATION from the Evaporator cell sump to Tank 43, the cell sump contents shall be verified, via sampling, to have a pH greater than or equal to 7.0.

(continued)

5.8.2.53 Chemical Cleaning Pump Tank Receipt Program

In addition to the Transfer Control Program, the following controls shall be implemented during F-Area Type I Waste Tank chemical cleaning operations.

a. Prior to TRANSFER INITIATION of transfer line vent and drain operations to FPT-1 associated with a CHEMICAL CLEANING TRANSFER, sufficient inhibitors shall be present in FPT-1 to ensure neutralization of the acidic waste. (SAC)

b. Prior to TRANSFER INITIATION of a FPP-1 sump transfer to FPT-1, sufficient inhibitors shall be present in FPT-1 to ensure neutralization of the acidic waste. This control shall apply to FPP-1 sump transfers as a result of sump level increase from the time of TRANSFER INITIATION of a CHEMICAL CLEANING TRANSFER through FPP-1, FDB-2, or FDB-3 until the transfer line vent and drain operation to FPT-1 is complete.

c. Prior to TRANSFER INITIATION of a FPP-2 sump transfer to FPT-2 involving acidic material, sufficient inhibitors shall be present in the FPP-2 sump to ensure neutralization of the acidic waste. This control shall apply to FPP-2 sump transfers as a result of sump level increase from the time of TRANSFER INITIATION of transfer line vent and drain operation to FPT-1 (associated with a CHEMICAL CLEANING TRANSFER) until the transfer line vent and drain operation to FPT-1 is complete.

5.9 Reporting Requirements

5.9.1 General Requirements

Written reports and oral notifications shall be submitted to DOE in accordance with DOE regulations regarding reporting requirements. These reports and notifications shall be prepared, reviewed, and approved in accordance with approved procedures.

5.9.2 TSR Violations

Violations of the TSR occur as a result of any of the following circumstances:

a. Exceeding an SL.

b. Failure to complete a REQUIRED ACTION statement within the Completion Time following exceeding an LCS or failing to comply with an LCO.

c. Failing to perform an SR within the required time limit (entry into SR 4.0.3 is a failure to perform an SR within the required time limit).

d. Failing to comply with a Specific Administrative Control (SAC) statement. For SACs which have an associated recovery action, a TSR violation would exist only upon failure to meet both the requirement and the recovery action.

e. Failure to comply with a Programmatic Administrative Control statement is a TSR violation when either the Administrative Control is directly violated, as would be the case with not meeting minimum staffing requirements for example, or the intent of a referenced program is not fulfilled. To qualify as a TSR violation, the failure to meet the intent of the referenced program would need to be significant enough to render the DSA summary invalid.

TSR violations must be reported to DOE in accordance with applicable DOE reporting requirements.

A TSR violation does not occur if there is a planned or purposeful entry into LCO 3.0.3 and a DOE approved RESPONSE PLAN is initiated prior to the expiration of the LCO Completion Time since the FACILITY stays within the TSR (as amended by the RESPONSE PLAN).

(continued)

5.9 Reporting Requirements (continued)

5.9.3 Conditions Outside the TSR

In an emergency, if a situation develops that is not addressed by the TSR, site personnel are expected to use their training and expertise to take actions to correct or mitigate the situation. Also, site personnel may take actions that depart from a requirement in the TSRs provided that (1) an emergency situation exists; (2) these actions are needed immediately to protect workers, the public or the environment from imminent and significant harm; and (3) no action consistent with the TSR can provide adequate or equivalent protection. Such action must be approved at a minimum by a qualified First-Line Manager or Shift Manager. If emergency action is taken, both a verbal notification shall be made to the responsible Head of the Field Element, and a written report shall be made to the Program Secretarial Officer within 24 hours.

5.10 Record Retention

The following records shall be retained for the period specified by the WSRC Record Retention Schedule:

a. Records of FACILITY operation

b. Records of principal maintenance activities, inspections, repairs, and replacements of principal items of equipment related to nuclear safety

c. Records of reportable events and occurrences

d. Records of surveillance activities, inspections, and calibrations required by TSRs

e. Records of changes made to procedures

f. Records and drawing changes reflecting FACILITY design modifications made to systems and equipment described in the Safety Basis

g. Records of radiation exposure for all individuals entering Radiological Buffer Areas

h. Records of gaseous and liquid radioactive material released to the environment

i. Records of FACILITY tests and experiments

j. Records of training and qualification for current members of the FACILITY operations staff

k. Records of USQ evaluations performed for changes or tests and experiments

l. Results of reviews and assessments

Section 6

Design Features

6.0 DESIGN FEATURES

6.1 Design Features Description, Vital Passive Components List, and Site Characteristics

6.1.1 This section identifies and describes the passive design features and passive SSCs not specifically required to have SLs, LCSs, or LCOs as required by 10 CFR 830 and DOE Implementation Guide DOE G 423.1-1.

Accordingly, the following description consists of a general overview as well as a table that provides a specific listing of the applicable passive SSCs, safety features summary, and design configurations summary. The table also provides a cross-reference to the DSA Chapter 4 section that gives additional details of the SSCs design feature.

6.1.2 Components such as piping, valves, vessels, supports, and confinement structures are passive components that, if altered or modified, could have an effect on safety. Passive components identified in Table 6.1.2-1 are credited in the safety analysis as performing a passive preventive or passive mitigative function. TSR Administrative Controls provide programmatic controls for Configuration Management (Section 5.8.2.8), Preventive Maintenance (Section 5.8.2.9), and Structural Integrity (Section 5.8.2.12) requirements for the design features.

6.1.3 The location of the FACILITY, with respect to the site boundary, is a design feature that is utilized in the analysis of the accident consequences to the public and workers. Changes in the site boundary would have an effect on the calculated accident consequences.

6.1.4 References

1. Nuclear Safety Management. Title 10, Code of Federal Regulations, Part 830, Final Rule, January 10, 2001.

2. Implementation Guide for Use in Developing Technical Safety Requirements. DOE Guide DOE G 423.1-1, October 24, 2001.

3. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

(continued)

Table 6.1.2-1 (Sheet 1 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Class SSCs		
Transfer Lines (Core Pipe) (4.3.1)	The Transfer Lines (Core Pipe) provide passive containment of liquid waste to prevent radioactive material leaks and spills into a transfer facility, transfer line jacket/encasement, waste tank annulus (Tank 40 and 50), or to the environment. Transfer Lines (Core Pipe) also provide passive containment of acidic waste material associated with F-Area Type I Waste Tanks during CHEMICAL CLEANING TRANSFERS. The Transfer Line (Core Pipe) integrity is required during normal operations, and during and following a seismic event. Flexible hose may be utilized for transfers. If utilized for CONTINGENCY TRANSFERS, the flexible hose is not required during and following a seismic event and is required to be Safety Significant only.	No Transfer Line (core piping) leakage is permitted. Transfer Lines are located below grade or shielded to reduce personnel exposure.
Transfer Line Jumpers/ Connectors (4.3.2)	The Transfer Line Jumpers/Connectors provide passive containment of liquid waste to prevent radioactive material releases and spills into a transfer facility. Transfer Line Jumpers/Connectors also provide passive containment of acidic waste material associated with F-Area Type I Waste Tanks during CHEMICAL CLEANING TRANSFERS. The Transfer Line Jumper/Connector integrity is required during normal operations, and during and following a seismic event except for “drip-wise” leakage. (Evaporator cell transfer jumpers are Safety Significant.)	Transfer Line Jumpers/Connectors are permitted to have “drip-wise” leakage.

Table 6.1.2-1 (Sheet 2 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Class SSCs		
Transfer Line Isolation Valves (4.3.3)	The Transfer Line Isolation Valves provide passive containment of liquid waste to prevent radioactive material releases and spills into a transfer facility. Transfer Line Isolation Valves also provide passive containment of acidic waste material associated with F-Area Type I Waste Tanks during CHEMICAL CLEANING TRANSFERS. The 242-16H Evaporator Isolation Valves provide passive containment of the acidic waste material in the evaporator (during chemical cleaning operations) to prevent the introduction of acidic material into a waste tank. The Transfer Line Isolation Valve boundary integrity is required during normal operations, and during and following a seismic event except for “drip-wise” leakage. The 242-16H Evaporator Isolation Valve boundary integrity is required during chemical cleaning operations, and during and following a seismic event (during chemical cleaning) except for external “drip-wise” leakage.	Transfer Line Isolation Valves (boundary integrity) are permitted to have “drip-wise” leakage.

Table 6.1.2-1 (Sheet 3 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	**SAFETY FEATURES**	**DESIGN CONFIGURATIONS**
Safety Class SSCs		
Diversion Boxes (including the HPFP) (4.3.4)	Diversion Boxes (including the HPFP) provide passive confinement to minimize the potential for a release of radiological material to the environment. Diversion Boxes (including the HPFP) provide structural integrity to support transfer line integrity (II/I). Additionally, they support ventilation system operation (where applicable). Diversion Box (including the HPFP) structural integrity is required during normal operations, during an external fire event, and during and following a seismic event. Although not Performance Category 2 (PC-2) high wind qualified, the surviving portion of the structure provides mitigation during and following a high winds event. Diversion Boxes that have an overflow capacity of greater than 15,000 gallons of liquid waste are designed and maintained to prevent an unrestricted release flowpath to the environment to reduce the effects of a radiological material release or spill. Diversion Boxes that have an overflow capacity of less than 15,000 gallons of liquid waste and those Diversion Boxes that are in the TRANSFER PATH for HIGH-REM WASTE TRANSFERS provide a containment feature to channel liquid such that the level detection equipment can perform its function to prevent an overflow of the Diversion Box.	Diversion Boxes are constructed of reinforced concrete and non-combustible material.

Table 6.1.2-1 (Sheet 4 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	**SAFETY FEATURES**	**DESIGN CONFIGURATIONS**
Safety Class SSCs		
Diversion Box Sump Steam Jets (including steam supply piping) (4.3.5)	The Diversion Box Sump Steam Jets (including steam supply piping inside the Diversion Box) provide passive containment of the motive steam/air to prevent radioactive material aerosolization and its subsequent release from the Diversion Box. The Diversion Box Sump Steam Jets (including steam piping inside the diversion box) boundary integrity is required during normal operations, and during and following a seismic event to prevent releasing steam/air into the waste material contained in the Diversion Box.	Diversion Box Sump Steam Jets (including steam supply piping inside the Diversion Box) are constructed of corrosion resistant material. Minor steam/air leakage is permitted at the steam supply line connectors for the sump transfer jets, provided the steam/air is not impinging on liquid waste contained in the Diversion Box.
Valve Boxes (including Drain Valve Boxes) (4.3.6)	Valve Boxes (including Drain Valve Boxes) provide passive confinement to minimize the potential for a release of radiological material to the environment. Valve Boxes provide structural integrity to support transfer line integrity (II/I). Additionally, they provide a containment feature to channel liquid to the level detection equipment to mitigate an overflow of the Valve Box. Valve Box structural integrity is required during normal operations, during an external fire event, and during and following a seismic event. Although not PC-2 high wind qualified, the surviving portion of the structure provides mitigation and during and following a high winds event.	Valve Boxes are constructed of non-combustible material.

Table 6.1.2-1 (Sheet 5 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	**SAFETY FEATURES**	**DESIGN CONFIGURATIONS**
Safety Class SSCs		
Pump Pits (4.3.7)	Pump Pits provide passive confinement to minimize the potential for a release of radioactive material to the environment. Pump Pits provide structural integrity to support transfer line integrity (II/I). Additionally, they provide a containment feature to channel liquid to the level detection equipment to prevent an overflow of the Pump Pit and support Pump Pit ventilation system operation. Pump Pit structural integrity is required during normal operations, during an external fire event, and during and following a seismic event. Although not PC-2 high wind qualified, the surviving portion of the structure provides mitigation during and following a high winds event.	Pump Pits are constructed of reinforced concrete and non-combustible material.
Pump Pit Sump Steam Jets (including steam supply piping) (4.3.8)	The Pump Pit Sump Steam Jets (including steam supply piping inside the Pump Pit) provide passive containment of the motive steam/air to prevent radioactive material aerosolization and its subsequent release from the Pump Pit. The Pump Pit Sump Steam Jets (including steam supply piping inside the Pump Pit) boundary integrity is required during normal operations, and during and following a seismic event to prevent releasing steam/air into the waste material contained in the Pump Pit.	Pump Pit Sump Steam Jets (including steam supply piping inside the Pump Pit) are constructed of corrosion resistant material. Minor steam/air leakage is permitted at the steam supply line connectors for the sump transfer jets, provided the steam/air is not impinging on liquid waste contained in the Pump Pit.

Table 6.1.2-1 (Sheet 6 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Class SSCs		
Pump Tanks (4.3.9)	Pump Tanks provide passive containment to minimize the potential for a release of radioactive material to the environment. Pump Tanks also support Pump Tank ventilation system operation. Pump Tank structural integrity is required during normal operations, and during and following a seismic event.	N/A
Type I, II, III, IIIA Waste Tanks (4.3.10)	Type I, II, III, IIIA Waste Tanks provide passive containment for the tank contents to prevent a release of liquid radiological material to the environment and provide passive confinement to mitigate an airborne radiological material release. The tank also maintains primary tank structural integrity to support the operation of the ventilation system. Type I, II, III, IIIA Waste Tank structural integrity (including tank top) is required during normal operations, during an external fire event, during and following a tornado/high winds event, and during and following a seismic event.	Waste Tank (excluding Tank 50) wall leakage is limited to a maximum of 0.4 gpm non-seismic and 4 gpm post-seismic leakage from the tank into the annulus. Waste Tank 50 wall leakage is limited to 0.0 gpm non-seismic and post-seismic leakage from the tank into the annulus.
Waste Tank Transfer Jets (including steam supply piping) (4.3.15)	The Waste Tank Transfer Jets (including steam supply piping inside the waste tanks) for Type I, II, III, and IIIA Waste Tanks provide passive containment of the motive steam/air to prevent radioactive material aerosolization from steam/air impingement at the liquid surface and its subsequent release from the waste tank. The Waste Tank Transfer Jets (including steam supply piping inside the waste tanks) boundary integrity is required during normal operations, and during and following a seismic event to prevent releasing steam/air into the waste material contained in the tank.	Waste Tank Transfer Jets (including steam supply piping inside the waste tanks) are constructed of corrosion resistant material. Minor steam/air leakage is permitted at the steam supply line connectors for the transfer jets and the packing boxes for telescoping transfer jets, provided the steam/air is not impinging on liquid waste contained in the waste tank.

Table 6.1.2-1 (Sheet 7 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Class SSCs		
242-16F, 242-16H, and 242-25H Evaporator Cells (4.3.16)	The 242-16F, 242-16H, and 242-25H Evaporator Cells provide protection to the evaporator pots thereby preventing the release of radioactive material from the evaporator pots. Each Evaporator Cell provides protection to the evaporator pot and associated equipment from tornado driven missiles and high winds. The 242-16F, 242-16H, and 242-25H Evaporator Cells structural integrity is required during normal operations, during an external fire event, and during a tornado/high winds event.	242-16F, 242-16H and 242-25H Evaporator Cells are constructed of reinforced concrete and non-combustible material. The interior of each cell is lined with stainless steel.
F-Area Type I Waste Tank Annulus Transfer Jets (Including Steam Supply Piping) (4.3.19)	F-Area Type I Waste Tank Annulus Transfer Jets (including steam supply piping inside the annulus) provide passive containment of the motive steam/air to prevent radioactive material aerosolization from steam/air impingement at the liquid surface and its subsequent release from the annulus. F-Area Type I Waste Tank Annulus Transfer Jets (including steam supply piping inside the annulus) boundary integrity is required during normal operations, and during and following a seismic event while performing F-Area Type I Waste Tank Chemical Cleaning to prevent releasing steam/air into the waste material contained in the annulus.	F-Area Type I Waste Tank Annulus Transfer Jets (including steam supply piping inside the annulus) are constructed of corrosion resistant material. Minor steam/air leakage is permitted at the steam supply line connectors for the annulus transfer jets, provided the steam/air is not impinging on liquid waste contained in the annulus.

Table 6.1.2-1 (Sheet 8 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
Transfer Pump Electrical Breakers / Disconnects (4.4.1)	Transfer Pump Electrical Breakers/Disconnects mitigate a radiological material release to the environment by providing a means for manual shutdown of the transfer pumps and evaporator feed pump by an operator. The Transfer Pump Electrical Breakers/Disconnects are capable of shutting down the transfer pump or evaporator feed pump during normal operations and following a seismic event.	N/A
Waste Tank Transfer Jet Steam / Air Isolation Valves (4.4.2)	Waste Tank Transfer Jet Steam/Air Isolation Valves mitigate a radiological material release to the environment by providing for a manual shutoff of the transfer jet steam/air supply by an operator. The Waste Tank Transfer Jet Steam/Air Isolation Valves are capable of isolating steam/air to the transfer jets during normal operations and following a seismic event.	N/A
Transfer Line Jackets / Encasements (4.4.3)	The Transfer Line Jackets/Encasements provide passive containment (confinement for encasements) of liquid waste to minimize radioactive material releases to the environment, to the annulus of Tank 40, and to channel core pipe leakage to a LEAK DETECTION LOCATION. The Transfer Line Jacket also provides airborne waste confinement. The Transfer Line Jacket/Encasement integrity is required during normal operations, and during and following a seismic event. Although not PC-2 high wind qualified, the surviving portion of the structure provides mitigation during and following a high winds event. Other transfer line jacket configurations (e.g., flexible hose within a hose) may be used as a transfer line jacket. If utilized for CONTINGENCY TRANSFERS, the flexible hose is not required during and following a seismic event.	N/A
HDB-4 Passive Vent (4.4.6)	HDB-4 Passive Vent provides a filtered release path to minimize the potential for a release of radiological material to the environment. HDB-4 Passive Vent is required during sump jetting operations.	N/A

Table 6.1.2-1 (Sheet 9 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
Pump Tank Passive Vents (excluding HPT-7, 8, 9, 10) (4.4.9)	The Pump Tank Passive Vents extend the time to reach LFL following the loss of active ventilation, when the Pump Tank is not receiving steam jetted transfers, thereby providing sufficient time to restore active ventilation before exceeding flammable conditions. The Pump Tank Passive Vents are required during normal operations, during an external fire event, during and following tornado/high winds event, and during and following a seismic event.	N/A
Leak Detection Boxes / Modified Leak Detection Boxes / Leak Probe Sleeves (4.4.12)	Leak Detection Boxes / Modified Leak Detection Boxes / Leak Probe Sleeves (LDBs/MLDBs/LPSs) provide passive containment to channel core pipe leakage to a LEAK DETECTION LOCATION. LDBs/MLDBs/LPSs are required during normal operations.	N/A
FPT-1 Pulse Tube Agitator Air Supply Pressure Relief Valve (4.4.15)	The FPT-1 Pulse Tube Agitator Air Supply Pressure Relief Valve prevents a release of radioactive material to the environment by limiting the jet suction air supply pressure. Limiting the supply air pressure to less than or equal to maximum relief valve setpoint ensures the suction lift generated is limited thus avoiding sucking waste into the jet and discharging it into the Pump Pit. The FPT-1 Pulse Tube Agitator Air Supply Pressure Relief Valve is required during normal operations.	FPT-1 Pulse Tube Agitator Air Supply Pressure Relief Valve limits air supply pressure less than or equal to 58 psig.
LDB Drain Cell (4.4.16)	The LDB Drain Cell provides passive confinement to mitigate a release of radioactive material to the environment. The LDB Drain Cell structural integrity is required during normal operations, and during and following a seismic event. Although not PC-2 high wind qualified, the surviving portion of the structure provides mitigation during and following a high winds event.	LDB Drain Cell is constructed of reinforced concrete.

Table 6.1.2-1 (Sheet 10 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
Influent Manual Isolation Valves (4.4.18)	The Influent Manual Isolation Valves provide a means of stopping non-waste additions (e.g., chemical additions, water additions) to waste tanks and pump tanks to mitigate a radioactive material release to the environment from an overflow event. The Influent Manual Isolation Valves are required to be capable of isolating non-waste supplies during normal operations.	N/A
Type IIIA Waste Tank Chromate Water Cooling Coils (excluding Tank 35) (4.4.19)	The Type IIIA Waste Tank Chromate Water Cooling Coils pressure boundary integrity (for Waste Tanks 25-28 and 36-51) prevents a release of radioactive material to the environment by preventing waste tank siphon or pump-out conditions. Maintaining the pressure boundary integrity of the Chromate Water Cooling Coils is required during normal operations, and during and following a seismic event.	No Chromate Water Cooling Coil leakage within the waste tank is permitted.
Waste Tank Chromate Water Header Isolation Valves (4.4.20)	The Waste Tank Chromate Water Header Isolation Valves mitigate a release of radioactive material to the environment by providing a means of stopping a siphon or pump-out of the waste tanks. Waste Tank Chromate Water Header Isolation Valves are required during normal operations for Tanks 25-28 and 36-51, and following a seismic event for Tanks 25-29 and Tanks 31-51.	Waste Tank Chromate Water Header Isolation Valves with minor “leak-by” are permitted.
Waste Tank 30 Chromate Water Coil Isolation Valves (4.4.22)	Waste Tank 30 Chromate Water Coil Isolation Valves mitigate a release of radioactive material to the environment by providing a means of stopping a siphon or pump-out of Tank 30. Waste Tank 30 Chromate Water Coil Isolation Valves are required during normal operations and following a seismic event.	Waste Tank Chromate Water Header Isolation Valves with “minor leak-by” are permitted.
Waste Tanks 29 and 31-35 Type III Chromate Water Cooling Coils (4.4.23)	Waste Tanks 29 and 31-35 Type III Chromate Water Cooling Coils prevent a release of radioactive material to the environment by maintaining pressure boundary integrity to prevent waste tank siphon or pump-out conditions. Chromate Water Cooling Coil pressure boundary integrity is required during normal operations.	No Chromate Water Cooling Coil leakage within the waste tank is permitted.

Table 6.1.2-1 (Sheet 11 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
Type IV Waste Tanks (4.4.24)	Type IV Waste Tanks provide passive containment of the tank contents to prevent a release of liquid radiological material to the environment and provide passive confinement to mitigate an airborne radiological material release. The tank also maintains primary tank structural integrity to support the operation of the ventilation system. The Type IV Waste Tanks structural integrity is required during normal operations, during an external fire event, during and following a tornado/high winds event, and during and following a seismic event.	N/A
Waste Tank Annulus (4.4.26)	The Waste Tank Annulus provides passive confinement of the annulus contents to prevent a release of radiological material to the environment. For Type III and IIIA annuli (excluding Tank 50), liquid containment features provide support for the operation of the annulus conductivity probes. The Waste Tank Annulus structural integrity is required during normal operations, and during and following a seismic event.	N/A

Table 6.1.2-1 (Sheet 12 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
Waste Tank Annulus Transfer Jets (including steam supply piping) (Except F-Area Type I Waste Tank Annulus Transfer Jets associated with Chemical Cleaning) (4.4.27)	The Waste Tank Annulus Transfer Jets (including steam supply piping inside the annulus) provide passive containment of the motive steam/air to prevent radioactive material aerosolization from steam/air impingement at the liquid surface and its subsequent release from the annulus. The Waste Tank Annulus Transfer Jets (including steam supply piping inside the annulus) boundary integrity is required during normal operations, and during and following a seismic event to prevent releasing steam/air into the waste material contained in the annulus.	Waste Tank Annulus Transfer Jets (including steam supply piping inside the annulus) are constructed of corrosion resistant material. Minor steam/air leakage is permitted at the steam supply line connectors for the annulus transfer jets, provided the steam/air is not impinging on liquid waste contained in the annulus.
Waste Tank Transfer Pump/Jet/SMP Risers (4.4.29)	The Waste Tank Transfer Pump/Jet/SMP Risers mitigate the release of radiological material to the environment by providing airborne waste confinement following a primary containment waste release into the riser, and also provide containment of liquid waste by channeling the liquid waste to the riser leak detection system or drain path, following a leak inside the riser. Waste Tank Transfer Pump/Jet Riser integrity is required during normal operations. SMP Riser integrity is required during normal operations, and during and following a seismic event.	N/A
H-Area Catch Tank and Catch Tank Encasement (4.4.33)	The H-Area Catch Tank and Catch Tank Encasement provide passive containment (confinement for encasement) of tank contents to minimize the potential for a release of radioactive material to the environment. Catch Tank and Catch Tank Encasement integrity is required during normal operations, during an external fire event, and during and following a seismic event. Although not PC-2 high wind qualified, the surviving portion of the structure provides mitigation during and following a high winds event.	N/A

Table 6.1.2-1 (Sheet 13 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
ADMP Air Supply Line Orifice (4.4.34)	The ADMP Air Supply Line Orifice mitigates a release of radiological material to the environment by limiting the air supply pressure and flow rate to the ADMP column. The ADMP Air Supply Line Orifice is required to be no larger than the diameter assumed in the safety analysis such that air flow into the waste tank is less than or equal to the maximum design value, following a failure of the ADMP column. The ADMP Air Supply Line Orifice is required during normal operations.	ADMP Air Supply Line Orifice inside diameter is less than or equal to 0.5 inches.
242-16F, 242-16H, and 242-25H Evaporator Steam Tube Bundles (4.4.35)	The 242-16F, 242-16H, and 242-25H Evaporator Steam Tube Bundles provide pressure boundary integrity for the steam and air such that a crack of the tube bundle is prevented. The Evaporator Steam Tube Bundle integrity is required during normal operations, and during and following a seismic event.	Evaporator Steam Tube Bundles are constructed of corrosion resistant material. The tube bundles shall have no measurable leaks.
242-16F, 242-16H, and 242-25H Evaporator Lance Air Supply Line Orifices (4.4.36)	The 242-16F, 242-16H, and 242-25H Evaporator Lance Air Supply Line Orifices mitigate an evaporator over pressurization condition and subsequent release of a radiological material leak to the environment by limiting the maximum air supply pressure and flow rate to the evaporator lance. The Lance Air Supply Line Orifices are required to be no larger than the diameter assumed in the safety analysis such that air flow is within the analysis assumption following a crack of the evaporator steam tube bundle. The Evaporator Lance Air Supply Line Orifices for the 242-16H, 242-16F, and 242-25H Evaporators are required during normal operations, and during a seismic event (protects initial conditions).	242-16F/242-16H Evaporator lance air supply line orifices diameters are less than or equal to 0.09 inches during operation and are less than or equal to 0.3 inches during chemical cleaning. 242-25H Evaporator lance air supply line orifices diameter are less than or equal to 0.15 inches.

Table 6.1.2-1 (Sheet 14 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
242-16F, 242-16H, and 242-25H Evaporator Lance Steam Supply Line Orifices (4.4.37)	The 242-16F, 242-16H, and 242-25H Evaporator Lance Steam Supply Line Orifices mitigate an evaporator over pressurization condition and subsequent release of a radiological material leak to the environment by limiting the maximum steam supply pressure and flow rate to the evaporator lance. The Lance Steam Supply Line Orifices are required to be no larger than the diameter assumed in the safety analysis such that steam flow is within the analysis assumption following a crack of the evaporator steam tube bundle. The Evaporator Lance Steam Supply Line Orifices are required during normal operations, and during a seismic event (protects initial conditions).	242-16F/242-16H Evaporator lance steam supply line orifices diameter are less than or equal to 0.43 inches. 242-25H Evaporator lance steam supply line orifice diameter is less than or equal to 1.086 inches.
242-16F/242-16H Evaporator Tube Bundle Steam Pressure Control Valves and Tube Bundle Steam Relief Valves (4.4.38)	The 242-16F/242-16H Evaporator Tube Bundle Steam Pressure Control Valves and Tube Bundle Steam Relief Valves mitigate an evaporator over pressurization condition and a subsequent radiological material release to the environment. The 242-16F/242-16H Evaporator Tube Bundle Steam Pressure Control Valves and Tube Bundle Steam Relief Valves are required during normal operations, and during and following a seismic event.	242-16F/242-16H Evaporator Tube Bundle Steam Pressure Control Valves maximum setpoint is 150 psig. 242-16F/242-16H Evaporator Tube Bundle Steam Relief Valves maximum setpoint is 170 psig.
242-25H Evaporator Lance Steam Pressure Control Valve and Lance Steam Pressure Relief Valve (4.4.39)	The 242-25H Evaporator Lance Steam Pressure Control Valve and Lance Steam Pressure Relief Valve mitigate an evaporator over pressurization condition and a subsequent radiological material release to the environment. The 242-25H Evaporator Lance Steam Pressure Control Valve and Lance Steam Pressure Relief Valve are required during normal operations, and during and following a seismic event.	242-25H Evaporator Lance Steam Pressure Control Valve maximum setpoint is 30 psig. 242-25H Evaporator Lance Steam Pressure Relief Valve maximum setpoint is 42 psig.

Table 6.1.2-1 (Sheet 15 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	**SAFETY FEATURES**	**DESIGN CONFIGURATIONS**
Safety Significant SSCs		
SMP Column Pressure Boundary (4.4.40)	The SMP Column Pressure Boundary provides a passive boundary to prevent waste from entering the SMP column, resulting in subsequent hydrogen buildup and explosion causing a radiological release to the environment. The SMP Column Pressure Boundary integrity is required during normal operations, during an external fire event, during and following a tornado/high winds event, and during and following a seismic event.	N/A
SMP Flush/Motor Pressure Boundary (4.4.41)	The SMP Flush/Motor Pressure Boundary provides a passive boundary to prevent waste from entering the SMP column, resulting in a subsequent radiological release to the environment from a spill, spray, or an explosion. The SMP Flush/Motor Pressure Boundary integrity is required during normal operations, during an external fire event, during and following a tornado/high winds event, and during and following a seismic event.	N/A
SMP Electrical Breakers / Disconnects (4.4.43)	The SMP Electrical Breakers/Disconnects mitigate a radiological material release to the environment by providing a means to secure power to the SMP to minimize the potential for an explosion following a seismic event. The SMP Electrical Breakers/Disconnects are capable of securing power to the SMP during normal operations and following a seismic event.	N/A
Mechanical Cleaning Crawler Lancing Device Motor Disconnects (4.4.45)	The Mechanical Cleaning Crawler Lancing Device Motor Disconnects provide a means of stopping high pressure water flow to the Mechanical Cleaning crawler lance in order to minimize the potential of a radioactive release to the environment from aerosolization in a waste tank. The Mechanical Cleaning Crawler Lancing Device Motor Disconnects are capable of securing power to the crawler lancing device motor during normal operations whenever the lancing device is operated from pressure sources greater than 10,000 psi.	N/A

6.1 Design Features Description, Vital Passive Components List, and Site Characteristics (continued)

Table 6.1.2-1 (Sheet 16 of 16)
Design Features

PASSIVE SSCs (DSA Chapt. 4 Ref.)	SAFETY FEATURES	DESIGN CONFIGURATIONS
Safety Significant SSCs		
Slurry Pump Electrical Breakers / Disconnects (4.4.46)	Slurry Pump Electrical Breakers/Disconnects mitigate a radiological material release to the environment by providing a means to secure power to the slurry pump following a aerosolization event during F-Area Type I Waste Tank Chemical Cleaning operations. Slurry Pump Electrical Breakers/Disconnects are capable of securing power to the slurry pump during normal operations.	N/A

Appendix A

Bases

B3/4.0 APPLICABILITY

B3.0 Limiting Conditions for Operation

BASES

LCOs	LCOs 3.0.1 through 3.0.6 establish the general requirements applicable to all LCOs and apply at all times, unless otherwise stated.
3.0.1	LCO 3.0.1 establishes the Applicability statement within each LCO as the requirement for conformance to the LCO for safe operation of the FACILITY or PROCESS AREA (i.e., when the FACILITY or PROCESS AREA is in the MODES or other specified conditions of the Applicability statement of each LCO). LCO 3.0.2 establishes the exception for requiring each LCO to be met.
3.0.2	LCO 3.0.2 establishes that upon discovery of a failure to meet an LCO, the associated Required Action(s) shall be met. The Completion Time of each Required Action for a given Condition is applicable from the point in time that the Condition is entered. The Required Action(s) establish those remedial measures that must be taken within specified Completion Times when the requirements of an LCO are not met. A TSR violation exists when the requirements of the LCO are not met and the associated Required Action(s) have not been satisfied within the specified Completion Time(s). The purpose of this LCO is to clarify the following: a. Implementation of the Required Action(s) within the specified Completion Time(s) constitutes compliance with an LCO, and b. Completion of the remedial measures of the Required Action(s) is not required when compliance with an LCO is restored, unless otherwise specified. Conditions in an LCO’s ACTIONS section may be concurrently applicable. For example, an LCO that requires two systems to be OPERABLE will typically have a Condition addressing the situation where one system is inoperable and another Condition addressing the situation where both systems are inoperable. When both systems are inoperable, both Conditions are applicable concurrently. The effect of this requirement is to ensure that the Completion Times associated with the Conditions are tracked correctly.

(continued)

3.0.2 (continued)

When a change in MODE or other specified condition is required to comply with Required Actions, the PROCESS AREA may enter a MODE or other specified condition in which a new condition becomes applicable. In this case, the Completion Times of the associated Required Actions of the new condition would apply from the point in time that the new condition becomes applicable.

The Completion Times for the Required Action(s) are also applicable when a system or component is removed from service intentionally. The reasons for intentionally relying on the Required Action(s) include, but are not limited to, performance of SRs, preventive maintenance, corrective maintenance, or investigation of operational problems. Such intentional entries into the LCO shall be performed in accordance with an approved procedure. Approved procedures are controlled administratively by the Administrative Controls section.

Some Completion Times in Required Actions require periodic performance on a “once per … Days” or “every … Hours thereafter” basis. For these recurring Required Actions, a 25% extension may be applied to each performance after the initial performance, unless otherwise stated in individual LCOs.

This allowable extension time is based on engineering judgment, as well as operating experience that indicates the most probable result of any periodic check is the verification of conformance to the required condition. Good operating practice would dictate that this extension is used only on an as-needed basis and is not normally relied upon as operational convenience to extend periodic Completion Time intervals beyond those specified.

(continued)

3.0.3 LCO 3.0.3 establishes the Required Actions that must be implemented when an LCO is not met and when one of the following conditions occurs:

a. An associated Required Action is not met in the specified Completion Time, and no other Condition applies, or

b. The Condition is not specifically addressed by the associated ACTIONS section.

This LCO requires that the affected PROCESS AREA(S) be placed in a MODE where the LCO does not apply if the limits for operation, as defined by the LCO and its ACTIONS section, cannot be met or associated Required Actions are not provided (It is not meant to place a PROCESS AREA in REPAIR MODE, CHEMICAL CLEANING MODE, MECHANICAL CLEANING MODE, or REMOVED FROM SERVICE MODE). This Required Action shall be initiated within 1 Hour and completed within 12 Hours. One Hour provides sufficient time for a safety-based review of the situation prior to initiating MODE change evolutions; 12 Hours is normally sufficient for completing the MODE change in a safe and orderly manner for most PROCESS AREA MODE changes. In those cases where the MODE change is not achievable in 12 Hours (e.g., placing a waste storage tank in REMOVED FROM SERVICE MODE), an approved RESPONSE PLAN shall be developed and initiated within 24 Hours after recognizing inability to complete the MODE change within the required 12 Hours using the guidance in the Administrative Controls section of this TSR.

However, it is recognized that some LCOs apply in all MODES. When this condition exists and LCO 3.0.3 is required to be entered, steps shall be initiated within 1 Hour and completed within 12 Hours to place the affected PROCESS AREA(S) in the MODE specified by LCO 3.0.3. This Required Action shall isolate the affected PROCESS AREA(S) and place them in the safest condition possible. Also, within 24 Hours, an approved RESPONSE PLAN shall be developed and initiated in accordance with guidance provided in the Administrative Controls section. Since there is no MODE in which the affected PROCESS AREA(S) can enter to exit the requirements of the LCO, the RESPONSE PLAN shall bound the activities to be conducted in the PROCESS AREA(S). The RESPONSE PLAN shall address the need for more frequent SRs as necessary.

(continued)

3.0.3 (continued)

This plan shall control the activities to be conducted in the affected PROCESS AREA(S). This plan shall be approved by the appropriate Facility Manager (or designee) and FOSC. The Completion Time of 24 Hours is sufficient to evaluate the conditions, develop the plan, and obtain necessary approvals.

Performing a MODE change directed by LCO 3.0.3 may be terminated and LCO 3.0.3 exited if any of the following occurs:

a. The LCO is now met.

b. A Condition exists for which the Required Actions have now been performed.

c. Required Actions exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition is initially entered and not from the time LCO 3.0.3 is exited.

Exceptions to LCO 3.0.3 may be provided in instances where requiring the FACILITY or PROCESS AREA(S) to be placed in a MODE where the LCO does not apply or in a MODE specified in LCO 3.0.3 would not provide appropriate remedial measures for the associated condition of the FACILITY or PROCESS AREA(S). Also LCO 3.0.3 shall not be interpreted to require placing a FACILITY or PROCESS AREA in a higher MODE, placing a PROCESS AREA in REPAIR MODE, placing a PROCESS AREA in CHEMICAL CLEANING MODE, placing a PROCESS AREA in MECHANICAL CLEANING MODE, or placing a PROCESS AREA in REMOVED FROM SERVICE MODE.

3.0.4

LCO 3.0.4 establishes limitations for MODE changes when an LCO is not met. It precludes placing the FACILITY or PROCESS AREA in a different MODE when the following exist:

a. The requirements of an LCO for that MODE have not been met, and

b. Continued noncompliance with these requirements would result in the FACILITY or PROCESS AREA being placed in a MODE or other specified condition in which the LCO does not apply to comply with the Required Action(s).

This LCO ensures that the operational activities within the FACILITY or PROCESS AREA are not initiated when corrective action is being taken.

(continued)

3.0.4 (continued)

Compliance with Required Action(s) that permit continued operation of the FACILITY or PROCESS AREA for an unlimited period of time provides an acceptable level of safety for continued operation without regard to the status of the FACILITY or PROCESS AREA before or after a MODE change. Therefore, in this case, entry into a MODE or other Condition may be made in accordance with the provisions of the applicable Required Action(s). The provisions of this LCO should not be interpreted as endorsing the failure to exercise good operating practice in restoring systems or components to OPERABLE status before beginning operations.

The provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with Required Actions. In addition, the provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that result from a normal shutdown. When a FACILITY is to be removed from a MODE to comply with Required Action(s), LCO 3.0.4 does not apply if it would delay placing the FACILITY or PROCESS AREA in a lower MODE.

Exceptions to LCO 3.0.4 are stated in the individual LCOs. Exceptions may apply to all the Required Actions or to a specific Required Action. Where exceptions to LCO 3.0.4 are specified, they remove the capability to rely on Required Actions for an unlimited period of time before entry into a MODE and they require compliance with the LCO prior to entry into the MODE.

When changing MODES or other specified conditions while in a Required Action's Condition, in compliance with LCO 3.0.4, or where an exception to LCO 3.0.4 is stated, the Required Actions define the remedial measures that apply. Surveillances do not have to be performed on the associated inoperable equipment (or on variables outside the specified limits), as permitted by SR 4.0.1. Therefore, a change in MODE or other specified condition in this situation does not violate SR 4.0.1 or SR 4.0.4 for those surveillances that do not have to be performed due to the associated inoperable equipment. However, SRs must be met to demonstrate OPERABILITY prior to declaring the associated equipment OPERABLE (or variable within limits) and restoring compliance with the affected LCO.

(continued)

3.0.5 LCO 3.0.5 establishes criteria to allow testing of equipment removed from service or declared inoperable to comply with Required Action(s). This LCO provides an exception to LCO 3.0.2 to allow testing to demonstrate one of the following:

a. OPERABILITY of the equipment being returned to service, or

b. OPERABILITY of other equipment.

It is reasonable to allow such testing to be conducted under administrative control to prove OPERABILITY and to return equipment to service. Typically the return of equipment to service places the FACILITY or PROCESS AREA in a more reliable and, therefore, safer condition. The return of equipment to service to test OPERABILITY shall be performed in accordance with approved procedures. Approved procedures are controlled administratively by the Administrative Controls section of this TSR.

The Administrative Controls are to ensure that the time the equipment is returned to service in conflict with the requirements of the Required Actions is limited to the time absolutely necessary to perform the allowed SRs. This LCO does not provide time to perform any other preventive or corrective maintenance.

An example of demonstrating the OPERABILITY of other equipment is taking an inoperable channel or trip system out of the tripped condition to prevent the trip function from occurring during the performance of an SR on another channel in the other trip system. A similar example of demonstrating the OPERABILITY of other equipment is taking an inoperable channel or trip system out of the tripped condition to permit the logic to function and indicate the appropriate response during the performance of an SR on another channel in the same trip system.

(continued)

3.0.6 LCO 3.0.6 establishes which Required Actions are applicable when support systems are declared inoperable, depending on whether the support system has an LCO specified in the TSR or not. When the support system has a separate LCO, the supported system is not required to be declared inoperable solely because of support system inoperability. This is an exception to the definition of OPERABLE. This exception is necessary to provide an appropriate interface between the support systems and the supported systems, to preclude cascading to the most restrictive supported system's Required Actions, and to eliminate the confusion associated with entering multiple LCO Conditions. This is justified because the Required Actions that are needed to ensure the FACILITY or PROCESS AREA are maintained in a safe condition are specified in the support system LCO's Required Actions. These Required Actions may include entering the supported system's Conditions and Required Actions or may specify other Required Actions. An example of a support system having its own LCO is the 254-13H Diesel Generator.

When a support system is inoperable and there is no LCO for that support system, the supported system shall be evaluated for inoperability or degradation. In this case, inoperability of a support system may or may not affect the OPERABILITY of the supported system. OPERABILITY of the supported system will depend on whether it can still perform its intended function taking into consideration the status of the support system. Until it is determined that the supported system is OPERABLE, the Required Action(s) of the applicable supported system's LCO shall apply.

B3/4.0 APPLICABILITY

B4.0 Surveillance Requirements

BASES

SRs	SRs 4.0.1 through 4.0.4 establish the general requirements applicable to all LCOs and apply at all times, unless otherwise stated.
4.0.1	SR 4.0.1 establishes the requirement that surveillances must be met during the MODES or other conditions specified in the Applicability statement of the LCO, unless otherwise specified in an individual SR. SR 4.0.1 ensures that surveillances are performed to verify the OPERABILITY of systems and components and that parameters are within specified limits. This SR produces a high degree of confidence that operation of the FACILITY or PROCESS AREA will be as predicted in the accident analysis. Surveillances do not have to be performed when the FACILITY or PROCESS AREA is in a MODE or other specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified. SR(s) do not have to be performed on inoperable equipment because the applicable Required Actions define the remedial measures that apply. However, applicable SRs may have to be met to demonstrate OPERABILITY prior to declaring the equipment OPERABLE. For example, if a tank ventilation system is declared inoperable due to a fan failure, verification that the fan can draw a sufficient exhaust flow rate must be performed prior to declaring the system OPERABLE. However, it is not necessary to perform an efficiency test on the associated HEPA filters if the maintenance activities did not involve the filters. SRs for the HEPA filters must be current in accordance with SR 4.0.2 to declare the system OPERABLE. When surveillances are performed to demonstrate OPERABILITY prior to declaring equipment OPERABLE, the time and date of the successful performance may be used to reestablish the periodicity for the SR in accordance with the specified frequency.

(continued)

4.0.1 (continued)

Upon completion of maintenance, appropriate post-maintenance testing is required to declare equipment OPERABLE. This testing includes meeting applicable SRs in accordance with SR 4.0.2. Post-maintenance testing may not be possible in the current MODE or other specified conditions.

In situations where the necessary parameters have not been established, the equipment may be considered OPERABLE provided testing has been satisfactorily completed to the extent possible and the equipment is not otherwise believed to be incapable of performing its function. This will allow operation to proceed to a MODE or other specified condition where other necessary post-maintenance tests can be completed.

4.0.2

SR 4.0.2 establishes the conditions under which the specified frequency for SRs may be extended. This requirement permits an allowable extension (25%) of the normal surveillance frequency of periodic SRs. This extension is intended to facilitate surveillance scheduling in consideration of FACILITY or PROCESS AREA operating conditions that may not be suitable for conducting the surveillance (e.g., transient conditions or other ongoing maintenance activities). However, this allowance is not to be applied to nonperiodic or conditional SRs (i.e., SRs whose frequency requires that the surveillance be performed at a particular point in time based on FACILITY or PROCESS AREA conditions, impending process evolutions, equipment conditions). The frequency for conditional SRs (e.g., "Prior to...", "Immediately") has been specified to ensure that a given condition exists or that actions are taken to preclude challenging the safe operating envelope as defined by the DSA.

If the periodic frequency statement for an SR contains applicability restrictions (e.g., every 24 Hours <u>during WASTE TRANSFERS</u>), the frequency shall be considered periodic and the 25% extension allowance may be applied. Frequency statements such as "Within 12 Hours prior to a WASTE TRANSFER" or "Within 30 Days following…" are conditional, and therefore the 25% extension allowance is not applicable.

The allowable extension time is based on engineering judgment, as well as operating experience that indicates the most probable result of any particular surveillance is the verification of conformance to the acceptance criteria. Good operating practice would dictate that this extension is used only on an as-needed basis and is not normally relied upon as an operational convenience to extend surveillance intervals beyond those specified.

(continued)

4.0.3 SR 4.0.3 establishes the failure to perform an SR within the allowed frequency defined by the provisions of SR 4.0.2, as well as any failure to meet an SR, as a condition that constitutes a failure to meet the OPERABILITY requirements for an LCO. This requirement clarifies that the Required Actions are applicable when SRs have not been completed or met within the allowed frequency. The Completion Times of the applicable Required Actions apply from the time it is identified that a surveillance has not been performed or is not met. Completion of the Required Actions within the allowed Completion Time either restores compliance with the LCO or provides adequate compensatory measures.

Failure to perform the surveillance within the frequency allowed by SR 4.0.2 requires the associated equipment to be declared inoperable and the applicable Required Action(s) to be entered. When an LCO is not met as a result of failure to perform an SR within the specified interval of SR 4.0.2, an allowance period of 24 Hours or up to the limit of the specified frequency, whichever is less, is provided prior to entering the Required Action(s) to permit completion of the SR and thus allow recovery in accordance with LCO 3.0.2. This allowance provides adequate time to plan and perform most routine SRs that have been missed, recognizing that the most probable result is a verification of conformance to the acceptance criteria. This allowance avoids challenges to FACILITY systems from an unnecessary transient. However, this allowance period is not to be applied to nonperiodic or conditional SRs (i.e., SRs whose frequency requires that the surveillance be performed at a particular point in time based on FACILITY or PROCESS AREA conditions, impending process evolutions, equipment conditions , etc.) unless a specific exception is included in the frequency. The frequency for nonperiodic and conditional SRs (e.g., “Prior to..., IMMEDIATELY”) has been specified to ensure that a given condition exists or that actions are taken to preclude challenging the safe operating envelope as defined by the accident analysis.

The allowance period commences at the time it is identified that a surveillance has not been performed. The Required Actions apply upon expiration of the allowance period if the SR is not completed. When the surveillance is performed and the acceptance criteria are not met, the Completion Times of the Required Action(s) apply from the time that the results are known.

SR 4.0.3 is not to be used to allow a MODE change prohibited by SR 4.0.4.

(continued)

4.0.3 (continued)	SR 4.0.3 also provides a time limit for completion of surveillances that become applicable as a consequence of MODE changes imposed by Required Action(s). Failure to comply with specified frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 4.0.3 is a flexibility that is not intended to be used as an operational convenience to extend surveillance intervals. If a surveillance is not completed within the allowed delay period, then the equipment is considered inoperable, or the variable is considered outside the specified limits, and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon expiration of the delay period. When the surveillance is performed and the acceptance criteria are not met within the delay period, then the equipment is considered inoperable, or the variable is considered outside the specified limits, and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon the failure of the surveillance. Completion of the surveillance within the delay period allowed by this LCO, or within the Completion Time of the Required Actions, restores compliance with SR 4.0.1.
4.0.4	SR 4.0.4 establishes the requirement that all applicable SRs must be met before entry into a MODE or other specified condition in the Applicability statement. The purpose of this requirement is to ensure that system and component OPERABILITY requirements, or parameter limits, are met before they apply. Unless otherwise stated, the required SRs must have been performed within their specified frequency prior to a change in MODE. The provisions of SR 4.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with Required Actions.

(continued)

4.0.4 (continued)	The precise requirements for performance of SRs are specified such that exceptions to SR 4.0.4 should not be necessary. The specific time frames and conditions necessary for meeting the SRs are specified in the frequency, in the surveillance, or both. This SR allows performance of surveillances when the prerequisite condition(s) specified in a surveillance procedure require entry into the MODE or other specified condition in the Applicability of the associated LCO prior to the performance or completion of a surveillance. A surveillance that could not be performed until after entering the LCO Applicability would have its frequency specified such that it is not "due" until the specific conditions needed are met. Alternately, the surveillance may be stated in the form of a note as not required (to be met or performed) until a particular event, condition, or time has been reached. If exceptions are required, they are stated in the individual SRs. The SRs are annotated consistent with the requirements of Section 1.5, Frequency, of this TSR.

B3/4.1 CRITICALITY PREVENTION

BASES

Assurance that the processing of any waste in the FACILITY will not create any criticality concerns is provided by Administrative Control 5.8.2.10 and Chapter 6 of the DSA. There are no LCOs related to criticality prevention.

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.1 Tank 48 Waste Tank Nitrogen Inerting System

BASES

BACKGROUND SUMMARY	The stored waste material in Tank 48 produces a mixture of flammable vapors which, if allowed to accumulate, could result in a deflagration event within the tank. Therefore, support ventilation equipment has been designed to prevent the occurrence of a deflagration. Tank 48 is equipped with a Nitrogen Inerting System, which delivers nitrogen to the vapor space of the tank. The vapor space is swept by a purge exhaust system via a separate tank riser. The purge gas is sampled for oxygen concentration and CLFL of flammable vapors. The Nitrogen Inerting System consists of two 100% capacity normal feed lines, one 100% capacity manual bypass feed line, and one low-flow manual bypass line (non-credited) to Tank 48. Each normal line consists of a flow element, flow control valve, pressure control valve used for backflow prevention, and a pressure switch to detect low flow conditions. The normal lines are operated in a manual mode from the control room. In the event both normal lines are unable to provide the required amount of nitrogen to the vapor space, manually operated bypass paths may be used. A Loss of Nitrogen Flow Interlock will trip the purge exhaust fans when low nitrogen flow is sensed in both normal feed lines to Tank 48. This interlock is initiated by low flow on both flow switches located in the normal feed lines.
APPLICATION TO SAFETY ANALYSIS	Flammable vapors are present in the vapor space of Tank 48. Hydrogen is generated as a result of radiolysis, benzene is generated from the STPB and its decomposition products that may be present, and smaller quantities of other flammable vapors may be present. Flammable vapors accumulating in the waste are released from the solution during agitation. The DSA takes credit for Tank 48 being inerted with nitrogen when elevated benzene release rates are possible (Ref. 1). This LCO protects the assumptions and restrictions described in the Reference 1 for Tank 48.

(continued)

LCO	The function of the Nitrogen Inerting System is to provide oxidant control of the vapor space in Tank 48. This function is accomplished by providing Tank 48 with an inert gas (nitrogen) in the vapor space to control oxidant concentration. For the Nitrogen Inerting System to be considered OPERABLE, a nitrogen flow of greater than or equal to 100 scfm must be supplied to the tank's vapor space. The LCO value of 100 scfm is based on an actual flow of 50 scfm adjusted for total instrument uncertainty (Ref. 3) for the normal nitrogen feed-lines. For the bypass feed line, the LCO value of 10 psid ensures that 50 scfm of nitrogen flow is provided, including adjustment for total instrument uncertainty (Ref. 4). The Loss of Nitrogen Flow Interlock trips the purge exhaust fans in the event of a loss of nitrogen supply to the tank in Mode B operation. This interlock protects the tank from an increase in air inleakage during a loss of nitrogen supply, which preserves the ability to maintain an inerted vapor space. The low flow switch in each of the normal nitrogen feed lines senses the loss of nitrogen. A signal from both flow switches is needed to actuate the interlock. The LCO value of 100 scfm for the actuation of the interlock is based on the actual flow of 50 scfm adjusted for total instrument uncertainty (Ref. 2). The Nitrogen Inerting System has some redundancies that allow for repair of some inoperable equipment or that allow for certain maintenance activities without requiring entry into the Required Actions of this LCO. The redundancies include two 100% capacity normal feed lines and one 100% capacity nitrogen bypass feed line.
MODE APPLICABILITY	This LCO applies any time radioactive waste or organic material is contained in Tank 48 when the potential for an elevated flammable vapor release rate is possible. Because such material can be in the tank in all MODES, this LCO is applicable in all MODES except during NON-INERTED OPERATION. During NON-INERTED OPERATION, the inerting controls contained in this LCO are not appropriate for deflagration prevention, therefore this LCO does not apply during NON-INERTED OPERATION.
PROCESS AREA APPLICABILITY	This LCO applies to Tank 48.

(continued)

ACTIONS

A.1 – A.3

Condition A of this LCO shall be entered if the Loss of Nitrogen Flow Interlock is inoperable or bypassed. When the interlock is inoperable or bypassed, a low nitrogen flow condition could exist and the interlock would fail to trip the on-line exhaust fan. Such a condition may result in an increase in air inleakage and challenge the ability to maintain an inerted vapor space. The interlock is considered to be bypassed only during local operation of the exhaust fan.

In Condition A the tank is in a degraded condition and actions shall be taken IMMEDIATELY to stop the slurry pumps and terminate liquid transfers into the tank. While in this Condition, liquid additions that meet the requirements in Administrative Control 5.8.2.48.c can be made. All other liquid transfers are administratively controlled / prohibited by Administrative Control 5.8.2.49. These additions are allowed because these actions are intended to minimize activities that could generate or liberate benzene during the restorative period. SR 4.3.4.1 shall be performed within 4 Hours of entering the Condition and every 4 Hours thereafter to ensure that the oxygen concentration is more closely monitored. This ensures that if oxygen concentration is greater than 6.9 vol%, LCO 3.3.4 Condition D can be entered in a timely manner to ensure the situation is corrected quickly. Performance of this monitoring is not subject to the 25% extension normally allowed by LCO 3.0.2 or SR 4.0.2.

A.4 – A.6

After completion of Required Actions A.1 – A.3, actions must be taken to verify that the benzene vapor concentration is less than or equal to 50 ppm within 12 Hours of entering Condition A. Also, within 12 Hours, actions must be taken to verify the benzene release rate is less than or equal to 2.3 grams/minute. A GC, calibrated under SR 4.2.10.9, or an alternate instrument may be used for this verification.

(continued)

ACTIONS (continued)

Initial checks indicating benzene vapor concentration is greater than 50 ppm or benzene release rate greater than 2.3 grams/minute do not require declaration that Required Action A.4 or A.5 is not met, as long as a subsequent check within the 12-Hour period shows the parameter(s) within the limit(s). Once these tank conditions are verified within the 12-Hour Completion Time, the Required Action is satisfactorily completed and the parameters are no longer restricted by these Required Actions. Programmatic controls described in Administrative Control 5.8.2.48.e govern the determination of the benzene release rate.

Required Action A.6 requires restoration of compliance with this Condition within 7 Days. Failure to restore the Loss of Nitrogen Flow Interlock to operation within 7 Days requires entry into LCO 3.0.3.

B.1 – B.4

Condition B is entered if the total nitrogen flow supplied to the tank via the normal nitrogen feed lines is less than 100 scfm and via the bypass nitrogen feed line is less than 10 psid or the flow indicator(s) used to perform SR 4.2.1.4 is inoperable. Insufficient nitrogen supply can degrade the ability to maintain the tank vapor space in an inerted condition.

Once Condition B is entered, no actions shall be taken that would create openings to the affected tank allowing air inleakage. This is to preserve the inerted atmosphere within the tank and to protect the safety analysis assumptions made in predicting that a minimum of 12 hours exists before the inerted atmosphere within the tank is lost (Ref. 1). A portion of Required Action B.1 (i.e., Trip exhaust fans) may occur by a hardwired interlock. Small connection points required to allow the use of portable monitoring instrumentation (e.g., portable CLFL monitors) are permitted. Only liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made.

(continued)

ACTIONS (continued)

Required Actions B1 – B.4 serve to IMMEDIATELY bottle up the tank to preserve the nitrogen inerted atmosphere in the tank. These actions also minimize the generation of flammable vapors in the tank. The safety analysis shows that an inerted state will remain in the bottled up tank for at least 12 hours (Ref. 1). Required Action B.4 requires that tank openings be closed IMMEDIATELY. This is to prevent large amounts of air inleakage that would quickly raise the oxygen concentration in the tank resulting in the loss of the inerted atmosphere sooner than the 12 hours assumed in the DSA (Ref. 1). Small cracks and airways for the inleakage of air were accounted for in the safety analysis and therefore were not required to be sealed.

B.5

SR 4.2.10.1 is performed within 4 Hours of entering Condition B and every 4 Hours thereafter to monitor the flammable vapor concentration within the tank. This ensures that if 20% of the CLFL is exceeded, Condition B of LCO 3.2.10 can be entered in a timely manner to ensure the situation is corrected quickly. Performance of this monitoring is not subject to the 25% extension normally allowed by LCO 3.0.2 or SR 4.0.2.

B.6.1 – B.6.2.3

Completing Required Actions B.1 – B.4 serves to IMMEDIATELY ensure the tank will be inerted for at least 12 hours (Ref. 1). To be conservative, the following Required Actions are based on the tank being inerted for at least 8 hours. At this point, two options are available, Required Action B.6.1 can be performed or Required Actions B.6.2.1 - B.6.2.3 are performed.

Required Action B.6.1 must not be performed if the capability to monitor oxygen concentration is not available. Required Action B.6.1 is the first option and requires that a nitrogen flow rate of greater than or equal to 100 scfm from either the normal nitrogen feed lines or greater than or equal to 10 psid using the bypass feed line be re-established within 8 Hours to the tank. Required nitrogen flow is verified using installed OPERABLE indicators. Successful completion of this Required Action allows Condition B to be exited.

(continued)

ACTIONS (continued)

Required Actions B.6.2.1 – B.6.2.3 provide the second option to be pursued. This option would typically be followed if the nitrogen purge ventilation system cannot be reestablished. Required Action B.6.2.1 requires a nitrogen flow rate into the tank greater than 5 scfm within 8 Hours. The tank remains otherwise bottled up with the exhaust fans tripped and the manual exhaust dampers closed.

The conservation vent bypass valve may be opened immediately prior to establishing nitrogen flow to the tank. Opening the valve just prior to establishing supplementary nitrogen flow protects against the possibility of tank over-pressurization. If supplemental nitrogen flow to the tank cannot be established, the conservation vent bypass valve shall be closed immediately, but not to exceed 20 minutes from the time the valve was initially opened. Twenty minutes is based on engineering judgment and minimizes the amount of time for oxygen ingress.

Next, either Required Action B.6.2.2.1 or B.6.2.2.2 is performed. Required Action B.6.2.2.1 ensures that the oxygen concentration remains below 6.9 vol%. The first performance of this Required Action must occur within 8 Hours of entering Condition B. This Required Action must then be repeated every 30 Minutes for the next hour and then repeated every 2 Hours thereafter. This will help to more accurately trend changes in oxygen concentration in the tank. Required Action B.6.2.2.1 can be satisfied by a measurement taken from the installed oxygen analyzer or by verification that the associated alarm is not activated. This Required Action may also be satisfied using alternate monitoring instrumentation.

If Required Action B.6.2.2.1 cannot be performed, the oxygen concentration within the tank cannot be monitored. Required Action B.6.2.2.2 then requires a nitrogen flow rate of greater than or equal to 30 scfm be established to the tank. Analysis shows that under worst case conditions of tank air inleakage (assuming the tank has been properly bottled up by performance of Required Actions B.1 – B.4) a 30 scfm nitrogen flow will ensure that an inerted atmosphere is preserved in the tank (Ref. 1). No additional margin has been applied to the safety analysis value of 30 scfm for the purposes of establishing the LCO Required Action value.

(continued)

ACTIONS (continued)

The analysis that established the 30 scfm value accounted for a significant increase in leakage area resulting from a seismic event. Since no credit is taken in the safety analysis for seismic capability, this approach provides adequate margin that precludes the need to adjust the 30 scfm value to account for instrument uncertainty. Since this Required Action is required within 8 Hours of entry into Condition B, the tank is still inerted when this flow begins which ensures that inerting is never lost within the tank.

Failure to restore nitrogen flow or the applicable nitrogen flow indicator within 8 Hours requires entry into LCO 3.0.3.

After completion of Required Actions B.6.2.1 and B.6.2.2.1 or B.6.2.2.2, the tank is in a safe condition that allows 7 Days to complete Required Action B.6.2.3 to restore compliance with this Condition. The tank can remain in this safe but degraded condition for no longer than 7 Days. Failure to complete Required Action B.6.2.3 within 7 Days requires entry into LCO 3.0.3.

SURVEILLANCE REQUIREMENTS

4.2.1.1 Not Used

4.2.1.2 Not Used

4.2.1.3 Not Used

4.2.1.4 Verifying the nitrogen flow rate is greater than or equal to 100 scfm monitors the ability of the Nitrogen Inerting System to support oxygen concentration control in the tank's vapor space. Oxygen concentration control is maintained by LCO 3.3.4 to ensure the tank vapor space remains in an inerted condition.

The bypass feed line equivalent flow indication of 10 psid satisfies the 100 scfm LCO value by providing sufficient flow and sufficient margin to account for any instrument uncertainties (Ref. 4).

Failure to meet or perform this SR requires entering Condition B of this LCO.

The 12-Hour surveillance frequency is considered adequate to track and trend any changes in nitrogen flow into the PROCESS AREA.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.2.1.5 Not Used

4.2.1.6 Not Used

4.2.1.7 Not Used

4.2.1.8 Not Used

4.2.1.9 The OPERABILITY of the Loss of Nitrogen Flow Interlock shall be verified at least once a year by performance of an INSTRUMENT LOOP TEST. The INSTRUMENT LOOP consists of the low flow switch in each normal feed line and the action circuitry that trips the exhaust fans. Each low flow switch shall actuate at a SETPOINT greater than or equal to 100 scfm. The operating and standby exhaust fans shall be verified to have tripped on a low nitrogen flow condition.

Failure to meet or perform the SR requires entry into Condition A of this LCO. Failure of the interlock to trip the exhaust fans shall require declaring the interlock inoperable and require entering Condition A of this LCO. The 1-Year surveillance frequency is based upon the reliability of the INSTRUMENT LOOP.

4.2.1.10 Not Used

4.2.1.11 Not Used

4.2.1.12 Not Used

4.2.1.13 Not Used

4.2.1.14 Not Used

4.2.1.15 Not Used

4.2.1.16 Not Used

4.2.1.11 Not Used

4.2.1.17 Not Used

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.2.1.18 An INSTRUMENT LOOP CALIBRATION shall be performed on each normal and bypass line nitrogen flow indicators every 90 Days.

The INSTRUMENT LOOP CALIBRATION shall verify that the indicators respond as required when compared with a known standard.

Failure of the INSTRUMENT LOOP CALIBRATION shall require declaring the instrumentation inoperable. Failure of the indicator(s) used to perform SR 4.2.1.4 requires entry into Condition B of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation, Loop: HI-241-948-LN-FS-5050-(A), HI-241-948-LN-FS-5050-(B) Tank 48 Nitrogen Feed Valves #1 and #2 Flow Interlock to Blowers. J-CLC-H-00222, Rev. 2, Washington Savannah River Company, Aiken, SC, February 2007.

3. Instrumentation Uncertainties Evaluation, Loop: HI-241-948-LN-FIT-2044-A, HI-241-948-LN-FIT-2044-B, Tank 48 Nitrogen Purge System (U). J-CLC-H-00174, Rev. 6, Washington Savannah River Company, Aiken, SC, February 2008.

4. Instrumentation Uncertainties Evaluation, Loops: HI-241-948-LN-PDI-2033, HI-241-949-LN-PDI-2067, Tank 48 and 49 Bypass Nitrogen Flow Indication. J-CLC-H-00675, Rev. 1, Washington Savannah River Company, Aiken, SC, February 2007.

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.2 Tank 48 Emergency Purge Ventilation Equipment

BASES

BACKGROUND SUMMARY

Tank 48 is equipped with a Nitrogen Purge Ventilation System, which can deliver nitrogen to the vapor space of the tank. The vapor space is purged or swept by an exhaust system via a separate tank riser. The vapor space is sampled for oxygen concentration and CLFL of flammable vapors.

During normal operation, the tank's purge exhaust flow is controlled by the purge exhaust fan and dampers. One purge exhaust fan is normally in service; the other is maintained in standby.

If both normal exhaust fans are inoperable on Tank 48, EPVE can be placed in service. The function of the EPVE is to provide emergency exhaust flow to prevent the buildup of flammable vapors. The EPVE is portable and may be hand-carried to the top of the tank in the event that both normal exhaust fans fail and cannot be restored within the time requirements of LCO 3.2.10. The EPVE is self-contained and does not rely on any site or FACILITY utilities to accomplish the intended function.

The EPVE is stored in Building 241-242H for protection against a seismic or high wind event. The EPVE consists of two EPVE engine/blower assemblies, one downcomer to connect the duct to the tank riser, one set of flexible duct sections, and one pitot hood. Additionally, one LEL analyzer is also stored in this location.

APPLICATION TO SAFETY ANALYSIS

Flammable vapors are present in the vapor space of Tank 48. Hydrogen is generated as a result of radiolysis, benzene is generated from STPB and its decomposition products that may be present, and smaller quantities of other flammable organic vapors may be present. Flammable vapors accumulating in the waste are released from the solution during agitation.

(continued)

LCO	This LCO requires the equipment specified in Table 3.2.2-1 to be OPERABLE and in the proper storage location. The storage location is Building 241-242H. For an EPVE engine/blower assembly to be considered OPERABLE, it must be stored in the approved storage location and capable of an exhaust flowrate of greater than or equal to 500 scfm. Additional equipment needed to operate the EPVE engine/blower assembly, as stated in Table 3.2.2-1, must be stored in Building 241-242H. This equipment includes a battery-operated portable LEL analyzer. This portable analyzer is required to test the flammable vapor concentration in Tank 48. The EPVE shall be properly stored such that it will be available following a seismic or high wind event. The LCO value of 2991 fpm is based on the 500-scfm requirement adjusted for total instrument uncertainty (Ref. 2).
MODE APPLICABILITY	This LCO applies any time radioactive waste or organic material is contained in Tank 48 and the tank is in NON-INERTED OPERATION. When radioactive material or benzene is contained in the tank, flammable vapors may accumulate in the tank's vapor space without an OPERABLE ventilation system to provide an air sweep through the tank. However, because the material cannot be fully removed from the tank, this LCO is applicable to all MODES during NON-INERTED OPERATION.
PROCESS AREA APPLICABILITY	This LCO applies to Tank 48.
ACTIONS	A.1 If a required component stated in Table 3.2.2-1 is not present in the proper storage location (Building 241-242H) or is inoperable, Required Action A.1 must be completed. The Completion Time of 7 Days is well within the 9 days to CLFL requirement for Tank 48 during NON-INERTED OPERATION.

(continued)

ACTIONS (continued)	Condition A shall not be entered solely due to the removal of EPVE components from the designated storage location to perform SR 4.2.2.3. This 90-Day surveillance is performed in the immediate vicinity of the storage building. Additionally, these components are only required during NON-INERTED OPERATION for which a minimum of 9 days-to-CLFL must be maintained (Administrative Control 5.8.2.48.a). The risk associated with losing the purge exhaust ventilation system during the performance of SR 4.2.2.3 is judged to be acceptable, especially in view of the 9 day-to-CLFL requirement (i.e., a significant amount of time would exist to recover from such an unlikely concurrent loss event). Failure to restore the components in Table 3.2.2-1 to the proper storage location or to restore the OPERABILITY of the components within 7 Days requires entry into LCO 3.0.3.
SURVEILLANCE REQUIREMENTS	4.2.2.1 Replacing the portable LEL analyzer every 7 Days with an OPERABLE, calibrated unit from the M&TE program ensures that the unit in storage has received all required maintenance. The frequency of 7 Days is within the manufacturer's recommendations. Failure to meet or perform this SR requires entering Condition A of this LCO. 4.2.2.2 Not Used 4.2.2.3 Verifying that each EPVE engine/blower assembly can provide an exhaust flow velocity of greater than or equal to 2991 fpm ensures that the EPVE is capable of maintaining an air sweep in the tank's vapor space to prevent the buildup of flammable vapors. This test shall be performed every 90 Days. This test requires starting up the EPVE engine/blower assembly and measuring the exhaust flow velocity. The 90-Day surveillance frequency while the EPVE is in storage is considered adequate to ensure the OPERABILITY of the stored EPVE. Failure to meet or perform this SR requires entering Condition A of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.2.2.4 Performing a visual inspection every 90 Days of the EPVE required components stated in Table 3.2.2-1 ensures that the required equipment is stored in the required storage location and that the EPVE is stored correctly to ensure availability following a seismic or high wind event. The 90-Day surveillance frequency is considered adequate to ensure the OPERABILITY of the stored EPVE. Failure to meet or perform this SR requires entering Condition A of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation Emergency Purge Ventilation Exhauster (EPVE) Flow Measurement Using ADM-870 / ADM-870C (U). J-CLC-H-00476, Rev. 3, Washington Savannah River Company, Aiken, SC, August 2008.

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.3 Not Used

BASES

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.4 Not Used

BASES

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.5 Not Used

BASES

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.6 Not Used

BASES

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.7 Tank 48 Fill Limit and Tank Level Instrumentation

BASES

BACKGROUND SUMMARY	Tank 48 is a Type IIIA annular tank with a capacity of 1,300,000 gallons. The tank is 85 feet in diameter and 33 feet high and is contained in a steel-lined, concrete structure. The area between the steel tank wall and concrete structure forms an inner and outer annulus, which allows leak detection and inspections of the primary tank wall. Cooling, ventilation, and secondary containment are provided for the tank (Ref. 1). Tank 48 is equipped with one High Liquid-Level Conductivity Probe (HLLCP). The HLLCP is the primary means of detecting an exceedance of the tank fill limit. The tank HLLCP is at a fixed level and is used to ensure that the liquid level in Tank 48 does not exceed the maximum fill limit. When the HLLCP detects that the liquid has risen to this fixed level, an alarm signal is sent to the associated Control Room.
APPLICATION TO SAFETY ANALYSIS	The DSA evaluates releases of material from waste tanks as a result of overflows and leaks. Additionally, releases were evaluated associated with Tank 48 specific accident analysis. The fill limit included in this LCO protects the assumptions and restrictions described in Reference 1 for Tank 48. The deflagration source term control for Tank 48 results in restricting the maximum fill limit to 252 inches. This control precludes entrainment from the liquid surface as this was not accounted for in the source term calculation supporting Reference 1.
LCO	The LCO limit of 248 inches for Tank 48 is established by the deflagration source term for the tank as this level precludes entrainment. The LCO limit for Tank 48 is based on the 252-inch requirement (Ref. 1) adjusted for total instrument uncertainty (Ref. 2). The HLLCP must be capable of providing an alarm if the tank fill limit is exceeded in order to determine compliance with this LCO. Because the HLLCP is the only credited means of detecting the exceedance of this fill limit, when an OPERABLE HLLCP alarms, Condition A of this LCO must be entered.

(continued)

MODE APPLICABILITY	The tank fill limit is applicable any time material is contained in the tank. Therefore, this LCO is applicable to all MODES.
PROCESS AREA APPLICABILITY	This LCO applies to Tank 48.

ACTIONS

A.1

With an OPERABLE HLLCP in alarm, actions shall be taken to bring the liquid level back within limits. IMMEDIATELY terminating transfers into the tank prevents further increases in tank level and allows restoration to within limits in a shorter amount of time.

A.2

Restoring the tank level to within limits (e.g., by transfer out of the tank) within 3 Days places the PROCESS AREA back into compliance with this LCO and protects the assumptions made in the Safety Analyses for tank waste volumes. The Completion Time of 3 Days is sufficient time to take necessary actions to minimize the time at risk.

Condition A shall not be entered solely due to the alarm generated as a result of the continuity check required by FACILITY operating procedures or SR 4.2.7.2. A continuity check is a simple, routine activity of a very short duration. The risk associated with this approach is judged acceptable since it is unlikely that a significant tank level change would occur concurrent with a HLLCP continuity check.

Failure to reduce the tank level within 3 Days requires entry into LCO 3.0.3.

(continued)

ACTIONS (continued)

B.1 – B.3

If the HLLCP or the associated alarm is inoperable for Tank 48, exceedance of the tank fill limit may go undetected. Since transfers into the tank can increase the potential for exceeding the tank fill limit, actions shall be taken IMMEDIATELY to terminate transfers into the tank. An alternate means of liquid-level monitoring shall be provided within 8 Hours to ensure that the tank level does not exceed the limit in this LCO. Additionally, the alternate monitoring shall have Control Room alarm capability or equivalent. Once an approved alternate means of measuring liquid level is established, transfers into the tank may resume. A period of 3 Days is adequate to restore the HLLCP to an OPERABLE status.

Condition B shall not be entered solely due to the alarm generated as a result of the continuity check required by FACILITY operating procedures or SR 4.2.7.2. A continuity check is a simple, routine activity of a very short duration. The risk associated with this approach is judged acceptable since it is unlikely that a significant tank level change would occur concurrent with a HLLCP continuity check.

Failure to restore the HLLCP and the alarm within 3 Days requires entry into LCO 3.0.3.

SURVEILLANCE REQUIREMENTS

4.2.7.1 Verifying every 24 Hours that tank level is within the limit stated in Table 3.2.7-1 as indicated by the alarm ensures that the tank fill limit has not been exceeded in a timely manner during routine operations. Failure to meet or perform this SR requires entering Condition A of this LCO.

4.2.7.2 A Continuity Check of the HLLCP ensures that the instrument is capable of indicating exceedance of the tank fill limit. The INSTRUMENT LOOP consists of the conductivity probe and associated circuitry and alarm. Performance of this Continuity Check also verifies that power is available to the alarm. Failure to meet or perform this SR requires entering Condition B of this LCO. The surveillance frequency of 7 Days is considered adequate to monitor adverse trends in instrumentation performance and is within the frequency specified in Reference 3.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation, Loop: HB-241-940-WTE-LE-2012, HM-241-941-WTE-LE-2010, HB-241-942-WTE-LE-2034, HI-241-948-WTE-LE-2014, HI-241-949-WTE-LE-2114, HI-241-950-WTE-LE-2216, HB-241-951-WTE-LE-5092, Waste Tank High Liquid Level Conductivity Probe (U). J-CLC-H-00473, Rev. 4, Westinghouse Savannah River Company, Aiken, SC, November 1998.

3. Assessment of Safety Class Alarm Loops for the H-Tank Farm Control Room Consolidation Project. J-CLC-H-00865, Westinghouse Savannah River Company, Aiken, SC.

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.8 Not Used

BASES

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.9 Not Used

BASES

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.10 Tank 48 Purge Exhaust Ventilation System

BASES

BACKGROUND SUMMARY

The operations performed within Tank 48 produce a mixture of flammable vapors, which if allowed to accumulate could result in a deflagration event within the tank or associated piping. Therefore support ventilation equipment has been designed to prevent the occurrence of a deflagration. Tank 48 is equipped with a Purge Exhaust Ventilation System which continuously sweeps the tank vapor space. The tank vapor space is sampled for flammable vapor concentration as a percentage of the CLFL.

The purge exhaust system for the tank consists of a demister, a purge exhaust condenser, an exhaust reheater, two parallel path HEPA filters, and two parallel path purge exhaust fans. The effluent is exhausted through a stack that is monitored for airborne radioactivity.

Air flow is controlled by adjusting the purge exhaust dampers to maintain the proper flow and tank vacuum conditions. The purge exhaust flow rate is measured by a differential pressure instrument located in the exhaust duct before the purge exhaust fans. This instrument readout is in inches WC.

A CLFL analyzer samples the tank vapor space to monitor for the presence of flammable vapors.

APPLICATION TO SAFETY ANALYSIS

Tank 48 stores salt supernate from the ITP process. Flammable vapors are present in the vapor space of Tank 48. Hydrogen is generated as a result of radiolysis, benzene is generated from STPB that may be present, and smaller quantities of other flammable organic vapors may be present. Flammable vapors accumulated in the waste are released from solution during agitation. A loss of ventilation could result in the flammable vapor concentration reaching the CLFL and the occurrence of an explosion if an ignition source were present.

The DSA (Ref. 1) credits flammable vapor control as a defense-in-depth measure during inerted operation of the Tank 48 ventilation system, and as the primary safety basis during operation of Tank 48 with the ventilation system in NON-INERTED OPERATION.

(continued)

APPLICATION TO SAFETY ANALYSIS (continued)

During NON-INERTED OPERATION, the DSA requires a minimum time to CLFL be maintained at the liquid/vapor interface (18 days) and in the bulk vapor space (9 days). At the liquid/vapor interface, the requirement is met if the benzene release rate is verified to be less than or equal to 2.3 grams/minute and the steady state vapor space concentration is verified to be less than or equal to 50 ppm. In the bulk vapor space, a calculation is performed, in accordance with Administrative Control 5.8.2.48.a, to verify that the time to reach the CLFL is 9 days or greater assuming an initial vapor space concentration of 37% of the CLFL, 100% retention for the quiescent period and a Loss of Ventilation event.

During inerted operations, the quantity of flammable materials permitted to accumulate in solution is the equivalent concentration that, if released, could cause the bulk vapor space to reach deflagrable concentrations. This assumes an initial condition of 37% of the CLFL and assumes 100% retention for the quiescent period and a Loss of Ventilation event.

The DSA also credits forced ventilation with preventing unfiltered releases which could result from operation of slurry pumps (Ref. 1). This accident is described in the Waste Tank Aerosolization Events section of the DSA.

LCO

The first function of the Purge Exhaust Ventilation System is to provide flammable vapor control of the vapor space in Tank 48. This function is accomplished by purging or “sweeping” the Tank 48 vapor space using the purge exhaust fans to maintain control of the flammable vapor concentration.

The system is performing its intended function when the Purge Exhaust Ventilation System can maintain the flammable vapor concentration below 37% of the CLFL. The LCO value of 20% of the CLFL is based on 37% of the CLFL value adjusted for total instrument uncertainty (Ref. 4).

The system must maintain an exhaust flow rate of at least 300 scfm (Ref. 1). Only one exhaust fan is required to be in service at any one time. The LCO value of 0.9 inches WC ensures the system is providing as least 300 scfm adjusted for total instrument uncertainty (Ref. 3).

(continued)

LCO (continued)	The CLFL analyzer required for this LCO is controlled in LCO 3.3.1. A GC is required to measure the benzene concentration and is used to provide input to calculate the benzene release rate for verification of entry conditions into NON-INERTED OPERATION. The second credited function of the Purge Exhaust Ventilation System is to filter the exhaust stream to reduce airborne radioactive particulate. To ensure the system can perform this function, this LCO requires the system to have at least one OPERABLE exhaust HEPA filter. An OPERABLE exhaust HEPA filter is required to have a performance test efficiency greater than or equal to 99.5%.
MODE APPLICABILITY	This LCO applies any time radioactive or organic material is contained in Tank 48. Because such material will be in the tank in all MODES, this LCO is applicable to all MODES.
PROCESS AREA APPLICABILITY	This LCO applies to Tank 48. Tank 48 contains radioactive material and can potentially have flammable vapors present in the vapor space.
ACTIONS	A.1 – A.3 With the differential pressure across the tank exhaust flow element less than 0.9 inches WC or with a component stated in Table 3.2.10-1 inoperable, actions shall be taken IMMEDIATELY to stop the slurry pumps. In addition, liquid transfers into the tank shall be terminated IMMEDIATELY. Only liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made. These Required Actions are intended to minimize activities that could generate or liberate flammable vapors and to place the tank in a static condition during the restoration period (Ref. 2). Required Action A.1 also ensures that there is no potential for waste to be aerosolized by the slurry pumps while the ventilation system is in a degraded condition.

(continued)

ACTIONS (continued)

SR 4.2.10.1 is performed within 4 Hours and every 4 Hours thereafter to monitor the flammable vapor concentration within the tank. This ensures that, if 20% of the CLFL is exceeded, Condition B can be entered in a timely manner since the purge exhaust ventilation system is in a degraded condition. Performance of this monitoring is not subject to the 25% extension normally allowed by LCO 3.0.2 or SR 4.0.2.

A.4

Compliance with this Condition shall be restored within 7 Days. Restoring the differential pressure across the tank exhaust flow element to greater than or equal to 0.9 inches WC ensures that the flowpath is unobstructed and that the exhaust fan is operating. A Completion Time of 7 Days is consistent with LCO 3.2.1. The 7-Day Completion Time provides sufficient time to restore the purge exhaust system to OPERABLE status without posing the risk of exceeding the CLFL when the tank is in NON-INERTED OPERATION.

Failure to restore differential pressure across the tank exhaust flow element to greater than or equal to 0.9 inches WC or restore OPERABILITY of components stated in Table 3.2.10-1 within 7 Days requires entry into LCO 3.0.3.

B.1, B.2

If the flammable vapor concentration of the tank's vapor space exceeds 20% of the CLFL or an OPERABLE CLFL analyzer is in alarm, actions shall be taken IMMEDIATELY to stop the slurry pumps on Tank 48. In addition, liquid transfers into Tank 48 shall be terminated IMMEDIATELY. These Required Actions minimize the generation and liberation of flammable vapors and ensure that the tank vapor space volume does not decrease and place the tank in a static condition during the restoration period (Ref. 2).

Condition B shall not be entered solely based on an inoperable CLFL analyzer or associated alarm.

(continued)

ACTIONS (continued)

B.3.1

The flammable vapor concentration of the tank's vapor space shall be restored to less than or equal to 20% of the CLFL within 12 Hours or compliance with Required Actions B.3.2.1 through B.3.2.3 is required. The Completion Time of 12 Hours avoids prolonged intervals at high CLFL conditions while providing adequate time to correct minor out-of-limit conditions.

Failure to restore the flammable vapor concentration of the tank's vapor space to less than or equal to 20% of the CLFL or clear the alarm within 12 Hours requires compliance with Required Actions B.3.2.1 through B.3.2.3.

B.3.2.1, B.3.2.2, B.3.3.3

A nitrogen purge ventilation flow of greater than or equal to 100 scfm must be established within 24 Hours using the nitrogen inerting system. The oxygen concentration in the tank must be restored to less than or equal to 6.9 vol% within 36 Hours. These Required Actions are intended to re-establish an inerted atmosphere in the tank. Compliance with the LCO requirement shall be restored within 7 Days following entry into this Condition.

Failure to complete these Required Actions within the Completion Times requires entry into LCO 3.0.3.

SURVEILLANCE REQUIREMENTS

4.2.10.1 Verifying that the concentration of flammable vapors is less than or equal to 20% of the CLFL monitors the ability of the Purge Exhaust Ventilation System to control the flammable vapor concentration in the tank's vapor space. This SR can be satisfied by a measurement taken from the installed CLFL analyzer or by verification that the associated alarm is not activated. This SR may also be satisfied using alternate monitoring instrumentation. Failure to meet or perform this SR requires entering Condition B of this LCO.

The 24-Hour surveillance frequency is adequate to detect an increase in flammable vapor concentration in a timely fashion and to perform adequate actions to control the flammable vapor concentration.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.2.10.2 Verifying that the differential pressure across the tank exhaust flow element is greater than or equal to 0.9 inches WC ensures that the purge exhaust flowpath is unobstructed and that the exhaust fan is operating. Verification of the differential pressure also ensures that the Purge Exhaust Ventilation System maintains an air sweep in the tank's vapor space to prevent the buildup of flammable vapors (Ref. 2). Failure to meet or perform this SR requires entering Condition A of this LCO. The 24-Hour surveillance frequency is considered adequate to ensure the availability of the purge exhaust system.

4.2.10.3 Not Used

4.2.10.4 An INSTRUMENT LOOP CALIBRATION shall be performed on the Tank 48 purge exhaust flow indicator every 90 Days. The INSTRUMENT LOOP CALIBRATION shall verify that the indicator responds as required when compared with a known standard. Failure to meet or perform this SR requires entry into Condition A of this LCO.

The 90-Day surveillance frequency is consistent with the uncertainty analysis for the instrument and is considered adequate to monitor adverse trends in instrumentation performance (Ref. 3).

4.2.10.5 Verifying that the steady state benzene vapor space concentration is less than or equal to 50 ppm within 12 Hours prior to entry into NON-INERTED OPERATION ensures that the initial condition for benzene concentration is satisfied and protects 347 ppm. The initial condition of 347 ppm is sufficiently low to ensure that 18 days to CLFL is maintained at the liquid/vapor interface, a prerequisite for entry into NON-INERTED OPERATION. Compliance with Administrative Control 5.8.2.48 is also required to enter into NON-INERTED OPERATION. If performance of this SR using the GC shows that the indicated benzene vapor concentration is greater than 50 ppm, then NON-INERTED OPERATION is not permitted.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.2.10.6 Verifying that the benzene release rate is less than or equal to 2.3 grams/minute within 12 Hours prior to entry into NON-INERTED OPERATION ensures that benzene release rate is sufficiently low to ensure that a minimum of 18 days to CLFL is maintained at the liquid/vapor interface. This determination is true if SR 4.2.10.5 is performed and is also satisfactory. Compliance with Administrative Control 5.8.2.48 is also required to enter into NON-INERTED OPERATION. Determination of the benzene release rate is governed by the program described in Administrative Control 5.8.2.48.e. If performance of this SR shows that the benzene release rate is greater than 2.3 grams/minute, then NON-INERTED OPERATION is not permitted.

4.2.10.7 Verifying that the Tank 48 slurry pumps have been tripped within 12 Hours prior to entry into NON-INERTED OPERATION ensures that assumptions made in the DSA are met (Ref. 1). If performance of this SR shows that the pumps have not been tripped, then NON-INERTED OPERATION is not permitted.

4.2.10.8 Not Used

4.2.10.9 Within 7 Days prior to performance of SR 4.2.10.5, an INSTRUMENT LOOP CALIBRATION shall be performed on the GC. The INSTRUMENT LOOP CALIBRATION shall verify that the instrument responds as required when compared with a known standard. If the GC is inoperable, then entry into NON-INERTED OPERATION is not permitted and, per Administrative Control 5.8.2.48.g, slurry pump operation is not permitted.

Performance of this SR is not subject to the 25% extension allowed by SR 4.0.2.

4.2.10.10 An in-place performance test shall be performed every 18 Months on the HEPA filters stated in Table 3.2.10-1. The efficiency of the HEPA filter shall be greater than or equal to 99.5%. The exhaust flow rate of the ventilation system must be greater than or equal to the value stated in Table 3.2.10-1 during the performance test of the HEPA filter.

The frequency of 18 Months is based on the guidance provided in References 5 and 6.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR requires declaring the affected HEPA filter inoperable and entering Condition A of this LCO if no other OPERABLE exhaust HEPA filter is available in the system.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Norkus, J. K. et al. In-Tank Precipitation Composite Lower Flammability Limit Analysis: Phase 2. WSRC-TR-94-0547, Westinghouse Savannah River Company, Aiken, SC, November 1994.

3. Instrumentation Uncertainties Evaluation, Loop: HI-241-948-HV-FE-2070, Tank 48 Nitrogen Purge Exhaust Flow. J-CLC-H-00667, Rev. 1, Washington Savannah River Company, Aiken, SC, February 2007.

4. Instrumentation Uncertainties Evaluation, Det-Tronics CLFL Monitor For Tank 48, Loop: HI-241-948-WTE-AT-2081. J-CLC-H-00621, Rev. 5, Westinghouse Savannah River Company, Aiken, SC, July 2004.

5. Testing of Nuclear Air Treatment Systems. ASME N510-1989, American Society of Mechanical Engineers, New York, December 1989.

6. Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants. Regulatory Guide 1.52, Office of Nuclear Regulatory Research, USNRC.

B3/4.2 TANK 48 CONFINEMENT INTEGRITY

B3.2.11 Tank 48 Normal Nitrogen Supply System

BASES

BACKGROUND SUMMARY	Nitrogen can be used to ventilate and inert Tank 48 due to the presence of a mixture of flammable vapors. The Nitrogen Inerting System supplies nitrogen gas directly into the tank. The Normal Nitrogen Supply System is located in the Cold Feeds Area. The Normal Nitrogen Supply System includes liquid nitrogen tanks, two vaporizer trains, and associated piping and instrumentation.
APPLICATION TO SAFETY ANALYSIS	As credited in the DSA (Ref. 1), inerting is one method of preventing a deflagration in Tank 48. An analysis of Tank 48 operation crediting inerting was conducted to provide guidance on the key elements required to preserve inerting during or following a full spectrum of normal process evolutions and following a design basis event. This LCO protects the assumptions and restrictions described in the safety analysis associated with the Normal Nitrogen Supply System.
LCO	The Normal Nitrogen Supply System must maintain a minimum liquid nitrogen inventory of 18,560 usable gallons. This volume provides 30 scfm nitrogen flow to Tank 48 for up to nine days (Ref. 2, 3, 4, 5). In addition to liquid nitrogen inventory, the level instrumentation on the nitrogen supply tanks that are required to perform SR 4.2.11.1 (i.e., Verify that the Normal Nitrogen Supply System liquid nitrogen inventory is greater than or equal to 18,560 usable gallons) must be OPERABLE. This means that if a tank level indicator is inoperable on a tank, the sum of the usable nitrogen inventory in the remaining tanks that do have OPERABLE tank level indicators shall be calculated. If this calculation shows that this inventory is greater than or equal to 18,560 usable gallons, then the inoperable tank level indicator is not considered to be "required" and therefore this LCO shall not be entered.

(continued)

MODE APPLICABILITY	This LCO applies any time inerting of the vapor space is the primary means of preventing a deflagration in Tank 48. During NON-INERTED OPERATION in Tank 48, flammable vapor control is the primary protection against a deflagration. Therefore, this LCO is applicable to all MODES except during NON-INERTED OPERATION.
PROCESS AREA APPLICABILITY	This LCO applies to Tank 48. Tank 48 is the only tank that requires a supply of nitrogen to be available except during NON-INERTED OPERATION.
ACTIONS	A.1 If the liquid nitrogen inventory of the Normal Nitrogen Supply System is less than 18,560 usable gallons or a Normal Nitrogen Supply System tank level indicator(s) required to perform SR 4.2.11.1 is inoperable, then this Condition shall be entered. The available liquid nitrogen supply inventory shall be restored to within the limits of this LCO or, the required level indicators that are inoperable shall be restored to OPERABLE status within 24 Hours. The 24-Hour Completion Time provides sufficient time to restore compliance with this Condition. Failure to restore the liquid nitrogen inventory or restore an OPERABLE indicator on the Normal Nitrogen Supply System within 24 Hours requires entry into LCO 3.0.3.
SURVEILLANCE REQUIREMENTS	4.2.11.1 Verification shall be made every 12 Hours that the Normal Nitrogen Supply System liquid nitrogen inventory is greater than or equal to 18,560 usable gallons. Failure to meet or perform this SR requires entering Condition A of this LCO. The 12-Hour surveillance frequency is considered adequate to track and trend any changes in nitrogen inventory. 4.2.11.2 Not Used 4.2.11.3 Not Used

(continued)

SURVEILLANCE REQUIREMENTS (continued)	4.2.11.4 The OPERABILITY of the normal Nitrogen Supply System tank level indicators shall be verified every 90 Days by performance of an INSTRUMENT LOOP CALIBRATION. The INSTRUMENT LOOP consists of the local indicator. Failure to meet or perform this SR on a required component stated in Table 3.2.11-1 requires entering Condition A of this LCO. The 90-Day surveillance frequency is based on current Waste Management practice and is considered adequate to monitor adverse trends in instrumentation performance.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation, Loop: HI-241-032-LN-PDIS-2002 Nitrogen Storage Tank No. 1 Level. J-CLC-H-00669, Rev. 1, Washington Savannah River Company, Aiken, SC, February 2007.

3. Instrumentation Uncertainties Evaluation, Loop: HI-241-032-LN-PDIS-2020, 2015, 2010, and 2005, Nitrogen Storage Tank No. 2-5 Level. J-CLC-H-00670, Rev. 1, Washington Savannah River Company, Aiken, SC, February 2007.

4. Instrumentation Uncertainties Evaluation, Loop: HI-241-032-LN-PDIS-2002, HI-241-032-LN-PDIS-2020, HI-241-032-LN-PDIS-2015, HI-241-032-LN-PDIS-2010, HI-241-032-LN-PDIS-2005, Total Nitrogen Inventory - Storage Tanks No. 1-5. J-CLC-H-00671, Rev. 1, Washington Savannah River Company, Aiken, SC, February 2007.

5. Parametric Evaluation for Required Nitrogen Inventories for ITP (U). S-CLC-H-00678, Rev. 0, Westinghouse Savannah River Company, Aiken, SC, November 1998.

B3/4.3 TANK 48 INSTRUMENTATION

B3.3.1 Tank 48 Flammable Vapor Monitoring Requirements

BASES

BACKGROUND SUMMARY	Tank 48 employs a nitrogen purge ventilation system due to the additional hazards presented by the presence of benzene. (Refer to LCOs 3.2.1 and 3.2.10 for more details on this type of ventilation system.) Tank 48 uses a CLFL analyzer to measure the flammable vapor concentration in the tank's vapor space. The Tank 48 CLFL analyzer is calibrated for benzene. The motive force for the sample is instrument air, which is used to draw a vapor space sample through the detection chamber.
APPLICATION TO SAFETY ANALYSIS	This LCO supports LCOs 3.2.1 and 3.2.10 by ensuring that the flammable vapor monitoring instrumentation required by these LCOs is OPERABLE. The application to safety for these systems can be found in the respective bases of each referenced LCO.
LCO	The function of this LCO is to ensure that the CLFL instrumentation required by various LCOs is OPERABLE. The required components and SETPOINTS are stated in Table 3.3.1-1. For the Tank 48 CLFL monitor to be OPERABLE, it must be provided sample flow and dilution flow at rates within the limits of the instrument's uncertainty analysis. In order to maintain actual sample and dilution flow to the instrument within the required range, the indicated sample and dilution flow must be greater than or equal to 1.8 cfh and less than or equal to 2.2 cfh (Ref. 2).
MODE APPLICABILITY	This LCO applies any time radioactive or organic material is contained in Tank 48. Because such material will be in the tank in all MODES, this LCO is applicable to all MODES.
PROCESS AREA APPLICABILITY	This LCO applies to Tank 48.

(continued)

ACTIONS

Condition A is deleted.

B.1, B.2

If the Tank 48 CLFL analyzer or associated alarm is inoperable or the CLFL sample flow or air dilution flow is out of limits, Required Actions shall be taken IMMEDIATELY to terminate liquid transfers into the tank. Only liquid additions that meet the requirements described in Administrative Control 5.8.2.48.c can be made once alternate monitoring has been provided. Actions shall be taken within 30 Minutes to stop the slurry pumps. The basis to permit continued slurry pump operations is that the tank is inerted when slurry pumps are operating and the vapor space is continuously diluted in Mode B ventilation operation. The basis for limiting the Completion Time to 30 Minutes is due to the potential loss of alarm capability. These Required Actions are intended to minimize activities that could generate or liberate flammable vapors and to place the tank in a static condition during the restoration period.

B.3.1

Compliance with this Condition shall be restored within 8 Hours. The Completion Time of 8 Hours is considered adequate to restore compliance with this Condition and adds little risk due to Required Actions that minimize flammable vapor generation and release.

B.3.2.1, B.3.2.2

Required Actions B.3.2.1 and B.3.2.2 provide a second option that can be pursued. This option is to verify within 8 Hours, and every 8 Hours thereafter, that the flammable vapor concentration is less than or equal to 20% of the CLFL for Tank 48. If entry into this Condition is based solely on a loss of the CLFL analyzer alarm function, then the installed CLFL analyzer may be used for this verification. This Required Action may also be satisfied using alternate monitoring instrumentation. In this Condition, the loss of alarm function during this short recovery period is compensated by increased monitoring frequency and Required Actions that minimize flammable vapor generation and release. For this option, compliance with this Condition shall be restored within 7 Days. The Completion Time of 7 Days is considered adequate to restore compliance with this Condition and adds little risk since an alternate source of CLFL monitoring is in place.

(continued)

SURVEILLANCE REQUIREMENTS

4.3.1.1 Not Used

4.3.1.2 Verifying that the CLFL sample flow is greater than or equal to 1.8 cfh and less than or equal to 2.2 cfh for Tank 48 ensures that the sample flow path is unobstructed and adequate sample flow is being provided to the CLFL analyzer. The sample flow is verified using the installed rotameter associated with the sample flow line at the CLFL analyzer. This verification ensures that the settings established for sample flow during the performance of SR 4.3.1.4 for the CLFL analyzer are being maintained between surveillance frequencies. Failure to meet or perform this SR requires entering Condition B of this LCO. The 24-Hour surveillance frequency is considered adequate to ensure that proper sample flow is being provided to the CLFL analyzer. The range of 1.8 cfh to 2.2 cfh is based on the flow range necessary to meet the CLFL analyzer uncertainty calculation assumptions (Ref. 3). This calculation accounted for the rotameter instrument uncertainties (Ref. 1).

4.3.1.3 Verifying that the CLFL air dilution flow is greater than or equal to 1.8 cfh and less than or equal to 2.2 cfh for Tank 48 ensures that the air dilution flow path is unobstructed and that adequate dilution flow is being provided to the CLFL analyzer. Because Tank 48 can use a nitrogen blanket, dilution air must be mixed with the sample flow in order for the CLFL analyzer to provide correct readings (Ref. 2). This differs from the other LFL analyzers that are monitoring non-inerted tanks that do not require dilution of the sample flow. The air dilution flow is verified using the installed rotameter associated with air dilution flow line at the CLFL analyzer. This verification ensures that the settings established for the air dilution flow during the performance of SR 4.3.1.4 for the CLFL analyzer are being maintained between surveillance frequencies. Failure to meet or perform this SR requires entering Condition B of this LCO. The 24-Hour surveillance frequency is considered adequate to ensure that proper air dilution flow is being provided to the CLFL analyzer. The range of 1.8 cfh to 2.2 cfh is based on the flow range necessary to meet the CLFL analyzer uncertainty calculation assumptions (Ref. 3). This calculation accounted for the rotameter instrument uncertainties (Ref. 1).

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.3.1.4 An INSTRUMENT LOOP CALIBRATION shall be performed on the components stated in Table 3.3.1-1 every 60 Days. The INSTRUMENT LOOP CALIBRATION shall verify that the CLFL analyzer and associated alarm responds as required when compared with a known standard. SETPOINT for the alarm shall be verified.

Failure to meet or perform this SR requires entering Condition B of this LCO. The 60-Day surveillance frequency is based on current Waste Management practice and is considered adequate to monitor adverse trends in instrumentation performance.

4.3.1.5 Not Used

4.3.1.6 Not Used

4.3.1.7 Not Used

4.3.1.8 Not Used

4.3.1.9 Not Used

4.3.1.10 An INSTRUMENT LOOP CHECK shall be performed on the CLFL analyzer every 7 Days. This INSTRUMENT LOOP CHECK shall verify that the CLFL measurement is consistent with a similar measurement from another instrument. Failure to meet or perform this SR requires entering Condition B of this LCO. The 7-Day surveillance frequency is considered adequate to ensure that a problem with the CLFL analyzer will be detected in a timely manner since time to CLFL is greater than 9 days for Tank 48 when in NON-INERTED OPERATION.

4.3.1.11 Not Used

(continued)

REFERENCES

1. Instrumentation Uncertainties Evaluation, CLFL Monitor Flows Tank 48: HI-241-948-WTE-FIC-2081A and HI-241-948-WTE-FIC-2081B (U). J-CLC-H-00625, Rev. 2, Westinghouse Savannah River Company, Aiken SC, May 2004.

2. Sample And Dilution Air Flow Effects On Oxygen And Flammable Vapor Concentration For Tanks 48 and 49 Combustible Gas Analyzers (U). G-CLC-H-00056, Rev. 2, Westinghouse Savannah River Company, Aiken SC, April 2000.

3. Instrumentation Uncertainties Evaluation, Det-Tronics CLFL Monitor For Tank 48, Loop: HI-241-948-WTE-AT-2081. J-CLC-H-00621, Rev. 5, Westinghouse Savannah River Company, Aiken, SC, July 2004.

B3/4.3 TANK 48 INSTRUMENTATION

B3.3.2 Not Used

BASES

B3/4.3 TANK 48 INSTRUMENTATION

B3.3.3 Not Used

BASES

B3/4.3 TANK 48 INSTRUMENTATION

B3.3.4 Tank 48 Oxygen Monitoring Requirements

BASES

BACKGROUND SUMMARY	The oxygen analyzers on Tank 48 are used to ensure that the oxygen is maintained at a safe level within the tank's vapor space except during NON-INERTED OPERATION. Tank 48 has two oxygen analyzers, with an associated alarm. Additionally, one portable oxygen analyzer is stored in the EPVE storage building.
APPLICATION TO SAFETY ANALYSIS	Flammable vapors are present in the vapor space of Tank 48. Hydrogen is generated as a result of radiolysis, benzene is generated from the STPB and its decomposition products that may be present, and smaller quantities of other flammable vapors may be present. Flammable vapors accumulating in the waste are released from the solution during agitation. The DSA takes credit for Tank 48 being inerted with nitrogen when elevated benzene release rates are possible (Ref. 1). This LCO protects the assumptions and restrictions described in the DSA.
LCO	The Oxygen Monitoring components stated in Tables 3.3.4-1 and 3.3.4-2 shall be OPERABLE and the actual oxygen concentration shall be less than or equal to 8 vol%. The MOC of 8 vol% allows for a margin of safety before reaching 9 vol%, which is the MOC necessary to sustain a deflagration of flammable vapor consisting of primarily benzene with less than roughly 50% hydrogen (Ref. 2). The LCO value of 6.9 vol% is based on the MOC value of 8.0 vol% adjusted for total instrument uncertainty (Ref. 3).
MODE APPLICABILITY	This LCO applies any time radioactive waste or organic material is contained in Tank 48 when the potential for elevated flammable vapor release rates is possible. Because such material can be in the tank in all MODES, this LCO is applicable in all MODES except during NON-INERTED OPERATION. During NON-INERTED OPERATION, the oxygen monitoring requirements contained in this LCO are not appropriate for deflagration prevention, therefore this LCO does not apply during NON-INERTED OPERATION.

(continued)

PROCESS AREA APPLICABILITY

This LCO applies to Tank 48. This is the only tank that relies on oxygen concentration control except during NON-INERTED OPERATION.

ACTIONS

A.1

With one oxygen analyzer inoperable, redundant monitoring capability is degraded or lost. Operations are permitted to continue for up to 7 Days before the instrument must be restored to OPERABLE status.

Failure to restore OPERABILITY of specified oxygen analyzer within 7 Days requires entry into LCO 3.0.3.

B.1, B.2

With both oxygen analyzers inoperable, the ability to monitor the tank vapor space oxygen content is degraded or lost. IMMEDIATELY stopping the slurry pumps and terminating liquid transfers into the tank is intended to minimize the generation or liberation of benzene and to place the tank in a static condition. Liquid additions are permitted per Administrative Control 5.8.2.48.c because of the stability of the TPB in Tank 48 and the historically low concentration of free benzene in solution.

B.3 – B.5

An alternate source of oxygen monitoring shall be established IMMEDIATELY, to monitor the oxygen concentration of the tank. SR 4.3.4.1 shall be performed IMMEDIATELY and every 4 Hours thereafter to monitor the oxygen concentration more frequently. Performance of the monitoring required by Required Action B.4 is not subject to the 25% extension normally allowed by LCO 3.0.2 or SR 4.0.2. If an oxygen analyzer was declared inoperable based solely on the loss of the associated alarm function, the installed analyzer may be used for Required Actions B.3 and B.4. In this Condition, the loss of alarm function during this short recovery period is compensated by increased monitoring frequency and Required Actions that minimize flammable vapor generation and release.

Compliance with this Condition shall be restored within 7 Days. The Completion Time of 7 Days is considered adequate to restore compliance with this Condition and adds little risk since an alternate source of oxygen concentration monitoring is in place.

(continued)

ACTIONS (continued)

Failure to restore both oxygen analyzers within 7 Days requires entry into LCO 3.0.3.

C.1

If the portable oxygen analyzer stated in Table 3.3.4-2 is not present in its proper storage location (Building 241-242H) or is inoperable, Required Action C.1 must be completed. Building 241-242H protects the portable oxygen analyzer from seismic and high wind events. This Condition does not apply and shall not be entered while the portable oxygen analyzer is being used to comply with LCO Required Actions B.3 of LCO 3.3.4 or B.6.2.2.1 of LCO 3.2.1. After these Conditions are exited, use of the portable oxygen analyzer is no longer required. The portable oxygen analyzer must be returned to its proper storage location within 2 Hours. If it is not returned within 2 Hours, this Condition shall be entered.

Failure to restore the portable oxygen analyzer to the proper storage location or to restore OPERABILITY of the portable oxygen analyzer within 7 Days requires entry into LCO 3.0.3.

D.1 – D.3

If the oxygen concentration is greater than 6.9 vol% or an OPERABLE oxygen analyzer is in alarm, the MOC protection against a tank deflagration is lost. IMMEDIATELY stopping the slurry pumps and terminating liquid transfers into the tank is intended to minimize the generation and liberation of benzene and to place the tank in a static condition.

The oxygen concentration shall be restored to less than or equal to 6.9 vol%. This Required Action shall be initiated IMMEDIATELY and completed in a period not to exceed 12 Hours. The Completion Time of IMMEDIATELY and not to exceed 12 Hours recognizes the importance of initiating and pursuing the Required Action to restore the oxygen concentration while establishing a limit of 12 Hours by which the Required Action must be completed. The 12-Hour Completion Time avoids prolonged intervals at high oxygen condition while providing adequate time to correct minor out-of-limit conditions.

Condition D shall not be entered solely based on an inoperable oxygen analyzer or associated alarm.

(continued)

SURVEILLANCE REQUIREMENTS

4.3.4.1 Verifying that the oxygen concentration is less than or equal to 6.9 vol% every 24 Hours ensures that the nitrogen inerting system is controlling the oxygen concentration in the tank's vapor space. This SR can be satisfied by a measurement taken from the installed oxygen analyzer or by verification that the associated alarm is not activated. This SR may also be satisfied using alternate monitoring instrumentation. Failure to meet or perform this SR requires entering Condition D of this LCO.

4.3.4.2 An INSTRUMENT LOOP CHECK shall be performed on the oxygen analyzers stated in Table 3.3.4-1 every 24 Hours. This INSTRUMENT LOOP CHECK shall verify that the oxygen concentration measurement is consistent with a similar measurement from another instrument. Failure to meet or perform this SR requires entering either Condition A or B of this LCO. The 24-Hour surveillance frequency is considered adequate to ensure that a problem with the oxygen analyzers will be detected in a timely manner.

4.3.4.3 Replacing the portable oxygen analyzer every 7 Days with an OPERABLE, calibrated unit from the M&TE program ensures that the unit in storage has received all required maintenance. The frequency of 7 Days is within the manufacturer's recommendations.

Failure to meet or perform this SR requires entering Condition C of this LCO.

4.3.4.4 An INSTRUMENT LOOP CALIBRATION shall be performed on the components stated in Table 3.3.4-1 every 90 Days. The INSTRUMENT LOOP CALIBRATION shall verify that the oxygen analyzer and associated alarm responds as required when compared with a known standard. SETPOINTS for alarms shall be verified.

Failure to meet or perform this SR requires entering Condition A or B of this LCO.

The 90-Day surveillance frequency is based on current Waste Management practice and is considered adequate to monitor adverse trends in instrumentation performance.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Thomas, J. K. Composite Minimum Oxygen Concentrations For Benzene-Hydrogen-Nitrogen-Air Mixtures (U). WSRC-RP-96-619, Westinghouse Savannah River Company, Aiken, SC, December 1996.

3. Instrumentation Uncertainties Evaluation, Loop: HI-241-948-HV-AT-2045, HI-241-948-HV-AT-2050, HI-241-949-HV-AT-2145, HI-241-949-HV-AT-2150, Tank 48 and 49 Oxygen Analyzers (U). J-CLC-H-00169, Rev. 6, Westinghouse Savannah River Company, Aiken, SC, May 2006.

B3/4.4 RESERVED FOR FUTURE USE

B3.4.1 Reserved For Future Use

BASES

B3/4.5 RESERVED FOR FUTURE USE

B3.5.1 Reserved For Future Use

BASES

B3/4.6 RESERVED FOR FUTURE USE

B3.6.1 Reserved For Future Use

BASES

B3/4.7 TRANSFER SYSTEMS

B3.7.1 Pump Pit Sumps

BASES

BACKGROUND SUMMARY	The Waste Transfer System is designed to prevent above-ground release of the waste being transferred. Many system components are designed to direct any leakage to either a waste storage tank or to a LEAK DETECTION LOCATION. These locations include pump pit sumps, diversion box sumps, valve boxes, drain valve boxes, the HPFP, LDBs, MLDBs, LPSs, tank risers, cell sumps, and tank annuli. Any radioactive aqueous caustic wastes leaked to these locations will continuously produce hydrogen due to the radiolysis of the contained water. Additionally, radioactive aqueous acidic wastes leaked to a pump pit may produce hydrogen due to the corrosion of carbon steel components. Although the pump pit liner, transfer lines, valves, and connectors associated with CHEMICAL CLEANING TRANSFERS are stainless steel, corrosion induced hydrogen may be generated if the acidic wastes contact carbon steel components located in the pump pit. Some of the LEAK DETECTION LOCATIONS are equipped with installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas. Conductivity probes are located in the pump pit sumps. These instruments are used to detect leaks and alarm to alert the operators to unusual conditions. The conductivity probes have alarms in their applicable control room.
APPLICATION TO SAFETY ANALYSIS	An assumption of the accident analysis is that at the start of certain events, the amount of waste already outside of primary containment in LEAK DETECTION LOCATIONS is a small fraction of the total volume of the structure. A limited waste inventory in pump pit sumps prior to an event is assumed in the following accidents in the safety analysis: Transfer Facility Explosions (FPP-2 only), Pump Pit and Pump Tank Explosion, and Transfer Error/SMP Waste Release (Ref. 1). Additionally during transfers associated with waste tank chemical cleaning operations, the safety analysis (Ref. 1) credits the conductivity probes in FPP-1 and FPP-2, and associated control room alarms, for detecting a release to mitigate a Pump Pit and Pump Tank Explosion accident.

(continued)

APPLICATION TO SAFETY ANALYSIS (continued)	The safety analysis (Ref. 1) credits the conductivity probes in the pump pits and their associated control room alarms. The probes and alarms are credited with alerting control room operators to liquid in a LEAK DETECTION LOCATION. The operator is then able to take action before the event results in a significant surface release. It also allows timely removal of the waste to prevent/mitigate explosions. The pump pit sump leak detection instruments are credited in the following accidents in the safety analysis: Transfer Facility Explosions (FPP-2 only), Pump Pit and Pump Tank Explosion (FPP-1 and FPP-2 only), and Transfer Error/SMP Waste Release (Ref. 1). Additionally, these leak detection instruments have been selected for protecting the limited waste inventory assumed in the following accident in the safety analysis: Pump Pit and Pump Tank Explosion.
LCO	This LCO requires that the waste level in pump pit sumps be less than or equal to the values stated in Table 3.7.1-2. The amount of waste in pump pit sumps is limited to 1.29% of the available volume of the structure. Except during CHEMICAL CLEANING TRANSFERS, this is based on maintaining the hydrogen concentration in those locations less than or equal to 25% of the LFL, assuming that the waste present in the location has the maximum hydrogen generation rate used in the accident analysis, and considering the effects of atmospheric breathing (Ref. 2, 3). During CHEMICAL CLEANING TRANSFERS, acidic wastes leaked to a pump pit could produce additional hydrogen due to the corrosion of carbon steel components. However, the safety analysis (Ref. 1) determined that it was unreasonable to assume a sufficient surface area of carbon steel exists within the sump to require adjustment of the setpoints previously determined to protect 25% of the LFL. The pump pit sump conductivity probe SETPOINTS stated in Table 3.7.1-2 are based on the level corresponding to the allowed volume, adjusted for total instrument uncertainty (Ref. 4-8). This LCO also requires that one leak detection instrument stated in Table 3.7.1-2 be OPERABLE in a pump pit sump. An OPERABLE leak detection instrument must be capable of detecting an increase in liquid level above the required SETPOINT of the probe and alarming in the control room to alert operators to the condition.

(continued)

LCO (continued)	It is not necessary to consider an alarming leak detection instrument inoperable, unless it is determined that the alarm has been caused by a failure of the instrument. An alarming conductivity probe has performed its function of alerting operators to a high level condition, and the conductivity probe is not required to subsequently perform any other credited function until the level is subsequently reduced below the SETPOINT of the conductivity probe.
MODE APPLICABILITY	For pump tanks, pump pit sump leak detection instruments are required whenever the pump tanks contain significant quantities of waste. Pump tanks are not limited in the amount of waste they can retain, except in REPAIR MODE. Therefore, this LCO is applicable to pump tanks in OPERATION and STANDBY MODES. For transfer lines, pump pit sump leak detection instruments are required to be OPERABLE whenever high inhalation dose potential material is permitted to be transferred through the location being supported by the leak detection instrumentation. Additionally, pump pit sump leak detection instruments are required to be OPERABLE whenever acidic wastes from chemical cleaning is permitted to be transferred through the location being supported by the leak detection instrumentation. Therefore, this LCO is applicable to transfer lines in HIGH-REM TRANSFER and CHEMICAL CLEANING TRANSFER MODES.
PROCESS AREA APPLICABILITY	This LCO applies to the PROCESS AREAS that can leak waste to the specified LEAK DETECTION LOCATIONS. Therefore, this LCO applies to pump tanks and also to transfer lines for which the pump pit sumps stated in Table 3.7.1-2 are credited LEAK DETECTION LOCATIONS.

(continued)

ACTIONS

The Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if waste level does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

A.1

Stopping WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected pump pit minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location or flushing the transfer line are not prohibited.

A.2

Ensuring that the waste level in the affected pump pit sump is less than or equal to the stated value within 48 Hours is intended to limit the time during which the waste levels exceed those assumed in the analysis.

The risk of higher than normal waste levels in the affected pump pit is acceptably small since actions were taken IMMEDIATELY to limit the amount of additional waste that could accumulate.

If this Required Action is not met and the Completion Time is not met, Condition C of this LCO is entered also (Condition A remains applicable).

(continued)

ACTIONS (continued)

The first Note preceding Required Action B.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if instrumentation does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

The second Note preceding Required Action B.1 states that upon entry into Condition B, Required Action B.2 shall be completed. This Note ensures that greater than allowed quantities of waste is not left in a pump pit sump after a transfer is terminated.

B.1

Stopping WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected pump pit IMMEDIATELY minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location or flushing the transfer line are not prohibited.

B.2

Verifying that the waste level in the affected pump pit sump is less than or equal to the stated value within 24 Hours is intended to limit the time during which the waste levels exceed those assumed in the analysis.

If this Required Action is not met or the Completion Time is not met, Condition A of this LCO is entered also (Condition B remains applicable).

(continued)

ACTIONS (continued)

B.3

The Note preceding Required Action B.3 states that upon initial completion of the Required Action, WASTE TRANSFERS which were in progress and temporarily stopped at the time Condition B was entered may be completed. Allowing completion of the transfers is appropriate because an alternate method is in use to compensate for the inoperable leak detection instrument.

Monitoring liquid level in the affected pump pit sump using an alternate monitoring device with control room notification capability provides an appropriate compensatory measure for allowing the transfer to continue for a limited period of time with the normal leak detection instrument inoperable. Administrative Control 5.8.2.7 is applicable to instrumentation used to perform this alternate monitoring.

Following the initial performance, repeating the Required Action every 15 Minutes ensures that excessive liquid accumulation in the pump pit sump is detected without significant delay. If the WASTE TRANSFER is not restarted, completion of this Required Action is not necessary.

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition B remains applicable).

B.4

Performing the MODE change directed by this Required Action removes those transfer lines from the MODE Applicability of this LCO. Placing the transfer lines associated with the affected pump pit in OPERATION MODE within 14 Days limits the period of time during which the PROCESS AREAS remain in a MODE that does not restrict HIGH-REM WASTE TRANSFERS or CHEMICAL CLEANING TRANSFERS.

The Completion Time of 14 Days is considered sufficient to complete any HIGH-REM WASTE TRANSFER or CHEMICAL CLEANING TRANSFER that was in progress when this LCO was entered.

(continued)

ACTIONS (continued)

C.1

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in the affected pump pit within 7 Days and every 7 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the pump pit.

The 7-Day initial and recurring Completion Times are sufficient to prevent flammable conditions from developing in the pump pit. Temporary hydrogen transients in excess of 15% of the LFL are not sufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

C.2

Purging the vapor space of the affected pump pit within 7 Days and every 7 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the pump pit. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of the pump pit (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning purge durations for transfer facilities can be found in the ERD (Ref. 9).

The 7-Day initial and recurring Completion Times are sufficient to prevent flammable conditions from developing in the pump pit.

SURVEILLANCE REQUIREMENTS

4.7.1.1 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 7 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 7 Days is based on engineering judgment.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO.

4.7.1.2 Conductivity probes are verified to be set at or below the value stated in Table 3.7.1-2 every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Residual Waste Volumes in Transfer Facilities (U). S-CLC-G-00272, Westinghouse Savannah River Company, Aiken, SC.

3. G. Arthur, M. Pelicone, Process Area Residual Levels for the 10CFR 830 DSA. HLW-STE-2002-00183, Rev. 4, Westinghouse Savannah River Company, Aiken, SC, August 2004.

4. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SR-3.7.1, Section 4.1. J-CLC-F-00282, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SR-3.7.1, Section 4.3 using G-CLC-F-00074 Loop: FM-241-021-WTS-LE-3499A. J-CLC-F-00286, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation FPP-3 Sump Conductivity Probe Installation Loop: FM-241-021-WTS-LE-3499B (U). J-CLC-F-00290, Westinghouse Savannah River Company, Aiken, SC.

(continued)

REFERENCES (continued)

7. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SVP-21, Section 4.1 or SW11.6-SR-3.7.1, Section 4.1. J-CLC-H-00765, Westinghouse Savannah River Company, Aiken, SC.

8. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SR-3.7.1, Section 4.2 or SW11.6-SVP-21, Section 4.3. J-CLC-H-00768, Westinghouse Savannah River Company, Aiken, SC.

9. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.2 Diversion Box Sump Level

BASES

BACKGROUND SUMMARY

The Waste Transfer System is designed to prevent above-ground release of the waste being transferred. Many system components are designed to direct any leakage to either a waste storage tank or to a LEAK DETECTION LOCATION. These locations include pump pit sumps, diversion box sumps, valve boxes, drain valve boxes, the HPFP, LDBs, MLDBs, LPSs, tank risers, cell sumps, and tank annuli.

Any radioactive aqueous caustic wastes leaked to these locations will continuously produce hydrogen due to the radiolysis of the contained water. Additionally, radioactive aqueous acidic wastes leaked to a diversion box may produce hydrogen due to the corrosion of carbon steel components. Although the diversion box liner, transfer lines, valves, and connectors associated with CHEMICAL CLEANING TRANSFERS are stainless steel, corrosion induced hydrogen may be generated if the acidic wastes contact carbon steel components located in the diversion box. Some of the LEAK DETECTION LOCATIONS are equipped with installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas.

APPLICATION TO SAFETY ANALYSIS

An assumption of the accident analysis is that at the start of certain events, the amount of waste already outside of primary containment in LEAK DETECTION LOCATIONS is a small fraction of the total volume of the structure. A limited waste inventory in diversion box sumps prior to an event is assumed in the following accidents in the safety analysis: Transfer Facility Explosions and Transfer Error/SMP Waste Release (Ref. 1).

LCO

This LCO requires that the waste level in diversion boxes be less than or equal to the values stated in Table 3.7.2-1.

(continued)

LCO (continued)

The amount of waste in diversion boxes is limited to 1.29% of the available volume of the structure. Except during CHEMICAL CLEANING TRANSFERS, this is based on maintaining the hydrogen concentration in those locations less than or equal to 25% of the LFL, assuming that the waste present in the location has the maximum hydrogen generation rate used in the accident analysis, and considering the effects of atmospheric breathing (Ref. 2, 3). During CHEMICAL CLEANING TRANSFERS, acidic wastes leaked to a diversion box could produce additional hydrogen due to the corrosion of carbon steel components. However, the safety analysis (Ref. 1) determined that it was unreasonable to assume a sufficient surface area of carbon steel exists within the sump to require adjustment of the setpoints previously determined to protect 25% of the LFL.

No specific method of measuring waste volumes is required by this LCO. Because these locations are normally monitored by conductivity probes, the table of this LCO provides information concerning the maximum conductivity probe height, including the effects of instrument uncertainty, that ensure that a conductivity probe would alarm upon increasing sump level no later than the time at which that location reached the allowed value in the analysis (Ref. 4-8).

If a method of measurement is used other than conductivity probes (e.g., dip tubes, visual/camera confirmation using available landmarks), then an uncertainty allowance associated with that method will be subtracted from the allowed value of the analysis when determining the acceptable observed value associated with using that method.

MODE APPLICABILITY

This LCO is applicable any time that waste could accumulate in a diversion box. Although this is most likely to occur during transfers of waste, some locations receive drainage from lengthy sections of pipe jackets where the transit time for the waste to actually reach a diversion box is indeterminate. Also, it is possible for relatively small amounts of waste to be flushed or drained into diversion boxes while transfers are not in progress.

Therefore, this LCO is applicable in All MODES.

PROCESS AREA APPLICABILITY

This LCO applies to the PROCESS AREAS that can leak waste to diversion boxes which are not inactive locations per Administrative Control 5.8.2.43.

(continued)

PROCESS AREA APPLICABILITY (continued)

Therefore, this LCO applies to transfer lines configured to a diversion box stated in Table 3.7.2-1.

ACTIONS

The Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if waste level does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

A.1

Stopping HIGH-REM WASTE TRANSFERS and CHEMICAL CLEANING TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected diversion box IMMEDIATELY minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location or flushing the transfer line are not prohibited.

A.2

Stopping WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected diversion box within 2 Hours minimizes the amount of additional waste likely to leak into that location.

The Completion Time of 2 Hours allows LOW-REM WASTE TRANSFERS to continue for a limited period of time following detection of a high level of liquid in a diversion box. This 2-Hour period is intended to allow sufficient time to reduce sump level to within limits. If the high level condition can be corrected within 2 Hours, subsequent completion of the Required Actions is not necessary (LCO 3.0.2).

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location or flushing the transfer line are not prohibited.

(continued)

ACTIONS (continued)

A.3

Ensuring that the waste level in the affected diversion box sump is less than or equal to the stated value within 48 Hours is intended to limit the time during which the waste levels exceed those assumed in the analysis.

The risk of higher than normal waste levels in the affected diversion box is acceptably small since actions were taken to limit the amount of additional waste that could accumulate.

If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition A remains applicable).

B.1.1

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in the affected diversion box within 24 Hours and every 24 Hours thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the diversion box.

The 24-Hour initial and recurring Completion Times are based on engineering judgment and are considered sufficient to trend hydrogen concentration. Temporary hydrogen transients in excess of 15% of the LFL are not sufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

B.1.2

Purging the vapor space of the affected diversion box within 24 Hours and every 24 Hours thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the diversion box. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of the diversion box (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning purge durations for transfer facilities can be found in the ERD (Ref. 9).

The 24-Hour initial and recurring Completion Times are based on engineering judgment and are considered sufficient to prevent a significant accumulation of hydrogen.

(continued)

ACTIONS (continued)

B.2

Placing the transfer lines associated with the affected diversion box in OPERATION MODE within 30 Days limits the period of time during which the PROCESS AREAS remain in a MODE that does not restrict HIGH-REM WASTE TRANSFERS or CHEMICAL CLEANING TRANSFERS.

The Completion Time of 30 Days is considered sufficient to complete any HIGH-REM WASTE TRANSFER or CHEMICAL CLEANING TRANSFER that was in progress when this LCO was entered.

SURVEILLANCE REQUIREMENTS

4.7.2.1 Verifying that the diversion box sump waste level is less than or equal to the required level stated in Table 3.7.2-1 every 30 Days ensures that the FACILITY is being operated within the assumptions of the safety analysis.

The surveillance frequency of 30 Days is based on the lengthy time to reach an equilibrium hydrogen concentration in a diversion box.

Failure to meet or perform this SR requires assuming that the affected diversion box sump is outside of its limits and entering Condition A of this LCO.

Administrative Control 5.8.2.7 is applicable to any instrument used to perform this SR.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Residual Waste Volumes in Transfer Facilities (U). S-CLC-G-00272, Westinghouse Savannah River Company, Aiken, SC.

3. G. Arthur, M. Pelicone, Process Area Residual Levels for the 10CFR 830 DSA. HLW-STE-2002-00183, Rev. 4, Westinghouse Savannah River Company, Aiken, SC, August 2004.

(continued)

REFERENCES (continued)

4. Instrumentation Uncertainties Evaluation Conductivity Probe Installation Procedure SW11.6-SVP-21, Section 4.2 using U-TRC-F-00191 Loop: FL-641-000-WTS-LE-1010. J-CLC-F-00291, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SVP-21, Section 4.2 using U-DCF-F-00033 Loop: FL-241-077-WTS-LE-6686. J-CLC-F-00285, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SVP-21, Section 4.1 or SW11.6-SR-3.7.1, Section 4.1. J-CLC-H-00765, Westinghouse Savannah River Company, Aiken, SC.

7. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SR-3.7.1, Section 4.2 or SW11.6-SVP-21, Section 4.3. J-CLC-H-00768, Westinghouse Savannah River Company, Aiken, SC.

8. Instrumentation Uncertainties Evaluation Conductivity Probe Installation Procedure SW11.6-SVP-21, Section 4.2 Using G-CLC-H-00060 Loop: HL-241-035-WTS-LE-1471. J-CLC-H-00774, Westinghouse Savannah River Company, Aiken, SC.

9. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.3 Diversion Box Leak Detection Instruments

BASES

BACKGROUND SUMMARY	The Waste Transfer System is designed to prevent above-ground release of the waste being transferred. Many system components are designed to direct any leakage to either a waste storage tank or to a LEAK DETECTION LOCATION. These locations include pump pit sumps, diversion box sumps, valve boxes, drain valve boxes, the HPFP, LDBs, MLDBs, LPSs, tank risers, cell sumps, and tank annuli. Any radioactive aqueous caustic wastes leaked to these locations will continuously produce hydrogen due to the radiolysis of the contained water. Additionally, radioactive aqueous acidic wastes leaked to a diversion box may produce hydrogen due to the corrosion of carbon steel components. Although the diversion box liner, transfer lines, valves, and connectors associated with CHEMICAL CLEANING TRANSFERS are stainless steel, corrosion induced hydrogen may be generated if the acidic wastes contact carbon steel components located in the diversion box. Some of the LEAK DETECTION LOCATIONS are equipped with installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas. Conductivity probes are located in the diversion boxes. These instruments are used to detect leaks and alarm to alert the operators to unusual conditions. The conductivity probes have alarms in their applicable control room.
APPLICATION TO SAFETY ANALYSIS	The safety analysis (Ref. 1) credits the conductivity probes in the diversion boxes and their associated control room alarms. The probes and alarms are credited with alerting control room operators to liquid in a LEAK DETECTION LOCATION. The operator is then able to take action before the event results in a significant surface release. It also allows timely removal of the waste to prevent/mitigate explosions. The diversion box leak detection instruments are credited in the following accidents in the safety analysis: Transfer Facility Explosions and Transfer Error/SMP Waste Release (Ref. 1).

(continued)

LCO

This LCO requires that one leak detection instrument stated in Table 3.7.3-1 be OPERABLE in a diversion box sump.

An OPERABLE leak detection instrument must be capable of detecting an increase in liquid level above the required SETPOINT of the probe and alarming in the control room to alert operators to the condition.

The amount of waste in diversion boxes is limited to 1.29% of the available volume of the structure. Except during CHEMICAL CLEANING TRANSFERS, this is based on maintaining the hydrogen concentration in those locations less than or equal to 25% of the LFL, assuming that the waste present in the location has the maximum hydrogen generation rate used in the accident analysis, and considering the effects of atmospheric breathing (Ref. 2, 3). During CHEMICAL CLEANING TRANSFERS, acidic wastes leaked to a diversion box could produce additional hydrogen due to the corrosion of carbon steel components. However, the safety analysis (Ref. 1) determined that it was unreasonable to assume a sufficient surface area of carbon steel exists within the sump to require adjustment of the setpoints previously determined to protect 25% of the LFL. The diversion box conductivity probe SETPOINTS stated in Table 3.7.3-1 are based on the level corresponding to the allowed volume, adjusted for total instrument uncertainty (Ref. 4-8).

It is not necessary to consider an alarming leak detection instrument inoperable, unless it is determined that the alarm has been caused by a failure of the instrument. An alarming conductivity probe has performed its function of alerting operators to a high level condition, and the conductivity probe is not required to subsequently perform any other credited function until the level is subsequently reduced below the SETPOINT of the conductivity probe.

MODE APPLICABILITY

For transfer lines, diversion box leak detection instruments are required to be OPERABLE whenever high inhalation dose potential material is permitted to be transferred through the location being supported by the leak detection instrumentation. Additionally, diversion box leak detection instruments are required to be OPERABLE whenever acidic wastes from chemical cleaning is permitted to be transferred through the location being supported by the leak detection instrumentation. Therefore, this LCO is applicable to transfer lines in HIGH-REM TRANSFER and CHEMICAL CLEANING TRANSFER MODES.

(continued)

PROCESS AREA APPLICABILITY

This LCO applies to the PROCESS AREAS that can leak waste to the specified LEAK DETECTION LOCATIONS.

Therefore, this LCO applies to transfer lines for which the diversion box sumps stated in Table 3.7.3-1 are credited LEAK DETECTION LOCATIONS.

ACTIONS

The first Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if instrumentation does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

The second Note preceding Required Action A.1 states that upon entry into Condition A, Required Action A.2 shall be completed. This Note ensures that greater than allowed quantities of high inhalation dose potential material is not left in a diversion box sump after a transfer is terminated.

A.1

Stopping HIGH-REM WASTE TRANSFERS and CHEMICAL CLEANING TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected diversion box IMMEDIATELY minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location or flushing the transfer line are not prohibited.

A.2

Ensuring that the waste level in the affected diversion box sump is less than or equal to the stated value within 24 Hours limits the time during which the waste levels exceed those assumed in the analysis.

If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition A remains applicable).

(continued)

ACTIONS (continued)

A.3

The Note preceding Required Action A.3 states that upon initial completion of the Required Action, WASTE TRANSFERS which were in progress and temporarily stopped at the time Condition A was entered may be completed. Allowing completion of the transfers is appropriate because an alternate method is in use to compensate for the inoperable leak detection instrument.

Monitoring liquid level in the affected diversion box using an alternate monitoring device with control room notification capability provides an appropriate compensatory measure for allowing the transfer to continue for a limited period of time with the normal leak detection instrument inoperable. Administrative Control 5.8.2.7 is applicable to the instrumentation used to perform this alternate monitoring.

Following the initial performance, repeating the Required Action every 15 Minutes ensures that excessive liquid accumulation in the diversion box sump is detected without significant delay. If the WASTE TRANSFER is not restarted, completion of this Required Action is not necessary.

If this Required Action is not met and the Completion Times are not met, Condition B of this LCO is entered also (Condition A remains applicable).

A.4

Performing the MODE change directed by this Required Action removes those transfer lines from the MODE Applicability of this LCO. Placing the transfer lines associated with the affected diversion box in OPERATION MODE within 14 Days limits the period of time during which the PROCESS AREAS remain in a MODE that does not restrict HIGH-REM WASTE TRANSFERS or CHEMICAL CLEANING TRANSFERS.

The Completion Time of 14 Days is considered sufficient to complete any HIGH-REM WASTE TRANSFER or CHEMICAL CLEANING TRANSFER that was in progress when this LCO was entered.

(continued)

ACTIONS (continued)

B.1

If Required Action A.2 or A.3 or their associated Completion Times are not met, Condition B of LCO 3.7.2 shall also be entered IMMEDIATELY (LCO 3.7.3 remains applicable). This Required Action will ensure that appropriate actions are taken in response to high waste level in a diversion box.

SURVEILLANCE REQUIREMENTS

4.7.3.1 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 7 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 7 Days is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition A of this LCO.

4.7.3.2 Conductivity probes are verified to be set at or below the value stated in Table 3.7.3-1 every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition A of this LCO.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Residual Waste Volumes in Transfer Facilities (U). S-CLC-G-00272, Westinghouse Savannah River Company, Aiken, SC.

3. G. Arthur, M. Pelicone, Process Area Residual Levels for the 10CFR 830 DSA. HLW-STE-2002-00183, Rev. 4, Westinghouse Savannah River Company, Aiken, SC, August 2004.

4. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SVP-21, Section 4.1 or SW11.6-SR-3.7.1, Section 4.1. J-CLC-H-00765, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SR-3.7.1, Section 4.2 or SW11.6-SVP-21, Section 4.3. J-CLC-H-00768, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation Conductivity Probe Installation Procedure SW11.6-SVP-21, Section 4.2 Using G-CLC-H-00060 Loop: HL-241-035-WTS-LE-1471. J-CLC-H-00774, Westinghouse Savannah River Company, Aiken, SC.

7. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SVP-21, Section 4.2 using U-DCF-F-00033 Loop: FL-241-077-WTS-LE-6686. J-CLC-F-00285, Westinghouse Savannah River Company, Aiken, SC.

8. Instrumentation Uncertainties Evaluation Conductivity Probe Installation Procedure SW11.6-SVP-21, Section 4.2 using U-TRC-F-00191 Loop: FL-641-000-WTS-LE-1010. J-CLC-F-00291, Westinghouse Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.4 Valve Boxes, Drain Valve Boxes, HPFP

BASES

BACKGROUND SUMMARY	The Waste Transfer System is designed to prevent above-ground release of the waste being transferred. Many system components are designed to direct any leakage to either a waste storage tank or to a LEAK DETECTION LOCATION. These locations include pump pit sumps, diversion box sumps, valve boxes, drain valve boxes, the HPFP, LDBs, MLDBs, LPSs, tank risers, cell sumps, and tank annuli. Any radioactive aqueous caustic wastes leaked to these locations will continuously produce hydrogen due to the radiolysis of the contained water. Additionally, radioactive aqueous acidic wastes leaked to these locations may produce hydrogen due to the corrosion of carbon steel components. Although the valve box liner, transfer lines, valves, and connectors associated with CHEMICAL CLEANING TRANSFERS are stainless steel, corrosion induced hydrogen may be generated if the acidic wastes contact carbon steel components located in the box. Some of the LEAK DETECTION LOCATIONS are equipped with installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas. Conductivity probes are located in the valve boxes, drain valve boxes, and the HPFP. These instruments are used to detect leaks and alarm to alert the operators to unusual conditions. The conductivity probes have alarms in their applicable control room.
APPLICATION TO SAFETY ANALYSIS	An assumption of the accident analysis is that at the start of certain events, the amount of waste already outside of primary containment in LEAK DETECTION LOCATIONS is a small fraction of the total volume of the structure. A limited waste inventory in valve boxes/drain valve boxes/HPFP prior to an event is assumed in the following accidents in the safety analysis: Transfer Facility Explosions and Transfer Error/SMP Waste Release (Ref. 1).

(continued)

APPLICATION TO SAFETY ANALYSIS (continued)	The safety analysis (Ref. 1) credits the conductivity probes in the valve boxes/drain valve boxes/HPFP and their associated control room alarms. The probes and alarms are credited with alerting control room operators to liquid in a LEAK DETECTION LOCATION. The operator is then able to take action before the event results in a significant surface release. It also allows timely removal of the waste to prevent/mitigate explosions. The valve box/drain valve box/HPFP leak detection instruments are credited in the following accidents in the safety analysis: Transfer Facility Explosions and Transfer Error/SMP Waste Release (Ref. 1).
LCO	This LCO requires that the waste level in valve boxes, drain valve boxes, and the HPFP be less than or equal to the values stated in Table 3.7.4-1. The amount of waste in most valve boxes / drain valve boxes / HPFP is limited to 1.29% of the available volume of the structure. Except during CHEMICAL CLEANING TRANSFERS, this is based on maintaining the hydrogen concentration in those locations less than or equal to 25% of the LFL, assuming that the waste present in the location has the maximum hydrogen generation rate used in the accident analysis, and considering the effects of atmospheric breathing (Ref. 2, 3). During CHEMICAL CLEANING TRANSFERS, acidic wastes leaked to a valve box could produce additional hydrogen due to the corrosion of carbon steel components. For locations associated with CHEMICAL CLEANING TRANSFERS, the conductivity probes shall be set at less than or equal to 1 inch to provide notification of a leak to operators. Additionally for other locations, it is not practical to detect waste volumes as small as 1.29% of the structure volume. In these locations, the amount of waste is also limited to a 1 inch level covering the floor of the structure. The valve box / drain valve box / HPFP conductivity probe SETPOINTS stated in Table 3.7.4-1 are based on the level corresponding to the allowed volume, adjusted for total instrument uncertainty (Ref. 4, 5, 6). This LCO also requires that one leak detection instrument stated in Table 3.7.4-1 be OPERABLE in a valve box / drain valve box / HPFP. An OPERABLE leak detection instrument must be capable of detecting an increase in liquid level above the required SETPOINT of the probe and alarming in the control room to alert operators to the condition.

(continued)

LCO (continued)	It is not necessary to consider an alarming leak detection instrument inoperable, unless it is determined that the alarm has been caused by a failure of the instrument. An alarming conductivity probe has performed its function of alerting operators to a high level condition, and the conductivity probe is not required to subsequently perform any other credited function until the level is subsequently reduced below the SETPOINT of the conductivity probe.
MODE APPLICABILITY	For transfer lines associated with valve boxes, drain valve boxes, and the HPFP, leak detection instruments are required to be OPERABLE under three circumstances. The first circumstance is whenever high inhalation dose potential material is permitted to be transferred through the location being supported by the leak detection instrumentation. The second circumstance is when the transfer lines that are supported by the leak detection instrumentation are isolated from the TRANSFER PATH for a HIGH-REM WASTE TRANSFER by a single non-leak checked valve. These two circumstances are allowed only in HIGH-REM TRANSFER MODE. The third circumstance is whenever acidic waste from chemical cleaning is permitted to be transferred through the location being supported by the leak detection instrumentation. This circumstance is allowed only in CHEMICAL CLEANING TRANSFER MODE. Therefore, this LCO is applicable to transfer lines in HIGH-REM TRANSFER or CHEMICAL CLEANING TRANSFER MODES.
PROCESS AREA APPLICABILITY	This LCO applies to the PROCESS AREAS that can leak waste to the specified LEAK DETECTION LOCATIONS. Therefore, this LCO applies to transfer lines for which the valve boxes, drain valve boxes, and the HPFP stated in Table 3.7.4-1 are credited LEAK DETECTION LOCATIONS.

(continued)

PROCESS AREA APPLICABILITY (continued)

Except for valve boxes associated with CHEMICAL CLEANING TRANSFERS, F-Area Tank Farm valve boxes are not identified as required LEAK DETECTION LOCATIONS for this LCO because F-Area Tank Farm will not conduct WASTE TRANSFERS that exceed the maximum allowed inhalation dose potential of LOW-REM WASTE TRANSFERS (Ref. 1). Therefore transfer lines associated with F-Area Tank Farm valve boxes will not be placed in HIGH-REM TRANSFER MODE. F-Area Tank Farm valve boxes associated with CHEMICAL CLEANING TRANSFERS are identified as a required LEAK DETECTION LOCATION of this LCO. The HPFP is identified as a required LEAK DETECTION LOCATION of this LCO because valves within the HPFP may provide isolation of F-Area Tank Farm from the TRANSFER PATH of a HIGH-REM WASTE TRANSFER conducted in H-Area Tank Farm.

The Tank 50 Valve Box is not identified as a required LEAK DETECTION LOCATION for this LCO because transfers associated with this valve box (and associated transfer lines) are not allowed to exceed an inhalation dose potential of 2.09E+5 rem/gallon (Ref. 1).

ACTIONS

The Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if waste level does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

A.1

Stopping WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION IMMEDIATELY minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location or flushing the transfer line are not prohibited.

(continued)

ACTIONS (continued)

A.2

Ensuring that the waste level in the affected LEAK DETECTION LOCATION is less than or equal to the stated value within 48 Hours is intended to limit the time during which the waste levels exceed those assumed in the analysis.

The risk of higher than normal waste levels in the affected LEAK DETECTION LOCATION is acceptably small since actions were taken IMMEDIATELY to limit the amount of additional waste that could accumulate.

If this Required Action is not met and the Completion Time is not met, Condition C of this LCO is entered also (Condition A remains applicable).

The first Note preceding Required Action B.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if instrumentation does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

The second Note preceding Required Action B.1 states that upon entry into Condition B, Required Action B.2 shall be completed. This Note ensures that greater than allowed quantities of waste is not left in a valve box / drain valve box / HPFP after a transfer is terminated.

B.1

Stopping WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION IMMEDIATELY minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location or flushing the transfer line are not prohibited.

(continued)

ACTIONS (continued)

B.2

Verifying that the waste level in the affected LEAK DETECTION LOCATION is less than or equal to the stated value within 24 Hours is intended to limit the time during which the waste levels exceed those assumed in the analysis.

If this Required Action is not met or the Completion Time is not met, Condition A of this LCO is entered also (Condition B remains applicable).

B.3

The Note preceding Required Action B.3 states that upon initial completion of the Required Action, WASTE TRANSFERS which were in progress and temporarily stopped at the time Condition B was entered may be completed. Allowing completion of the transfers is appropriate because an alternate method is in use to compensate for the inoperable leak detection instrument.

Monitoring liquid level in the affected LEAK DETECTION LOCATION using an alternate monitoring device with control room notification capability provides an appropriate compensatory measure for allowing the transfer to continue for a limited period of time with the normal leak detection instrument inoperable. Administrative Control 5.8.2.7 is applicable to instrumentation used to perform this alternate monitoring.

Following the initial performance, repeating the Required Action every 15 Minutes ensures that excessive liquid accumulation in the LEAK DETECTION LOCATION is detected without significant delay. If the WASTE TRANSFER is not restarted, completion of this Required Action is not necessary.

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition B remains applicable).

(continued)

ACTIONS (continued)

B.4

Performing the MODE change directed by this Required Action removes those transfer lines from the MODE Applicability of this LCO. Placing the transfer lines associated with the affected LEAK DETECTION LOCATION in OPERATION MODE within 14 Days limits the period of time during which the PROCESS AREAS remain in a MODE that does not restrict HIGH-REM WASTE TRANSFERS or CHEMICAL CLEANING TRANSFERS.

The Completion Time of 14 Days is considered sufficient to complete any HIGH-REM WASTE TRANSFER or CHEMICAL CLEANING TRANSFER that was in progress when this LCO was entered.

C.1

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in the affected LEAK DETECTION LOCATION within 24 Hours and every 24 Hours thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the LEAK DETECTION LOCATION.

The 24-Hour initial and recurring Completion Times are based on engineering judgment and are considered sufficient to trend hydrogen concentration. Temporary hydrogen transients in excess of 15% of the LFL are not sufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

C.2

Purging the vapor space of the affected LEAK DETECTION LOCATION within 24 Hours and every 24 Hours thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the LEAK DETECTION LOCATION. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of the LEAK DETECTION LOCATION (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning purge durations for transfer facilities can be found in the ERD (Ref. 7).

The 24-Hour initial and recurring Completion Times are based on engineering judgment and are considered sufficient to prevent a significant accumulation of hydrogen.

(continued)

SURVEILLANCE REQUIREMENTS

4.7.4.1 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 7 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 7 Days is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO if no other probe in the LEAK DETECTION LOCATION is OPERABLE.

4.7.4.2 Conductivity probes are verified to be set at or below the value stated in Table 3.7.4-1 every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO if no other probe in the LEAK DETECTION LOCATION is OPERABLE.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Residual Waste Volumes in Transfer Facilities (U). S-CLC-G-00272, Westinghouse Savannah River Company, Aiken, SC.

3. G. Arthur, M. Pelicone, Process Area Residual Levels for the 10CFR 830 DSA. HLW-STE-2002-00183, Rev. 4, Westinghouse Savannah River Company, Aiken, SC, August 2004.

4. Instrumentation Uncertainties Evaluation HTF Conductivity Probes Installation, Procedure SW11.6-SVP-21, Section 4.5. J-CLC-H-00759, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation Loops: ED-641-LD-LE-6096 A & B High Point Flush Pit Sump Conductivity Probes. J-CLC-E-00004, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation FTF Conductivity Probes Installation, Procedure SW11.6-SVP-21, Section 4.5. J-CLC-F-00278, Westinghouse Washington Savannah River Company, Aiken, SC.

7. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.5 Transfer Facility Ventilation (Excluding HDB-8 Complex and HDB-7)

BASES

BACKGROUND SUMMARY

The Waste Transfer System includes pump tanks and diversion boxes to allow for flexible configurations of TRANSFER PATHS. Not all TRANSFER PATHS include pump pits or diversion boxes.

Any radioactive aqueous caustic wastes contained in pump tanks or leaked to a pump pit or diversion box will continuously produce hydrogen due to the radiolysis of the contained water. Additionally, radioactive aqueous acidic wastes leaked to a pump pit or diversion box may produce hydrogen due to the corrosion of carbon steel components. Although the pump pit or diversion box liner, transfer lines, valves, and connectors associated with CHEMICAL CLEANING TRANSFERS are stainless steel, corrosion induced hydrogen may be generated if the acidic wastes contact carbon steel components located in the pump pit or diversion box. Some of the transfer facilities are equipped with installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas.

All transfer facility ventilation systems include an exhaust fan and an exhaust filter. Some transfer facility ventilation systems also include inlet filters along with condensers, demisters and reheaters on the exhaust path.

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits transfer facility ventilation systems with purging hydrogen and with filtering radioactive particulate from airborne releases from the facility (Ref. 1).

Transfer facility ventilation systems are credited in the following accidents in the safety analysis: Transfer Facility Explosions, Pump Pit and Pump Tank Explosion, and Aerosolization Events (Ref. 1).

LCO

This LCO requires that transfer facility ventilation systems be OPERABLE. To be OPERABLE, all transfer facility ventilation systems require an operating fan generating the required purge flow through the system, an intact flow path (e.g., ductwork, filter housing, reheater shell) from the transfer facility to the fan, and an online exhaust filter capable of removing radioactive particulate from the exhaust stream.

(continued)

LCO (continued)	This LCO also requires that the transfer facility ventilation systems have an OPERABLE exhaust flow indicator and that the exhaust flow rate be greater than or equal to a minimum value. The minimum required value for exhaust flow is based on the safety analysis value of 17 scfm per pump tank supported by the exhaust system, adjusted for total instrument uncertainty (Ref. 2-5). For transfer facilities that have multiple pump tanks through which flow is drawn in parallel, the minimum total flow requirement is doubled to account for potential flow imbalances. To account for higher organic contribution to pump tank flammable vapor concentrations during Canyon Process Vessel Vent flushes, the total flow through the transfer facility ventilation system shall be at least 68 scfm per pump tank contained in the transfer facility (includes effects of potential flow imbalances), adjusted for total instrument uncertainty (Ref. 2-5). In the case of transfer facilities that do not share ventilation systems with pump tanks, the minimum exhaust flow is based on the amount needed to maintain a flammable vapor concentration of less than or equal to 25% of the LFL within the structure. This flow is also adjusted for total instrument uncertainty (Ref. 6).
MODE APPLICABILITY	This LCO applies to pump tanks when the tanks are allowed to contain significant quantities of radioactive waste and when WASTE TRANSFERS into or through pump tanks are allowed. Therefore, this LCO applies to pump tanks in OPERATION and STANDBY MODES. This LCO applies to certain transfer lines when HIGH-REM WASTE TRANSFERS are allowed through those lines. HIGH-REM WASTE TRANSFERS are only allowed in HIGH-REM TRANSFER MODE. Therefore, this LCO applies to the specified transfer lines in HIGH-REM TRANSFER MODE.
PROCESS AREA APPLICABILITY	This LCO applies to all transfer facilities for which forced ventilation was credited in the safety analysis, except for the HDB-8 Complex and HDB-7. HDB-8 Complex is addressed by LCO 3.7.6. HDB-7 is addressed by LCO 3.7.7. Therefore, this LCO is applicable to FPT-1, FPT-2, FPT-3, HPT-2, HPT-3, HPT-4, HPT-5, HPT-6, and transfer lines for which HDB-2 or HDB-6 is a credited LEAK DETECTION LOCATION.

(continued)

PROCESS AREA APPLICABILITY (continued)

This LCO does not apply to transfer lines for which FDB-2 and FDB-4 are credited LEAK DETECTION LOCATIONS because no F-Area Tank Farm WASTE TRANSFERS will be HIGH-REM WASTE TRANSFERS (Ref. 1).

ACTIONS

The first Note preceding Required Action A.1 states that upon entry into Condition A, Required Action A.5 shall be completed, except for HDB-6. This ensures that the hydrogen concentration in the transfer facility is returned to a low value before this LCO Condition is exited. HDB-6 is excepted from this Note because Required Action A.5 is not applicable to HDB-6. HDB-6 does not normally contain sufficient waste in its sump to pose a flammability concern.

A.1

The second Note preceding Required Action A.1 states that Required Action A.1 is not applicable to HDB-6. HDB-6 is a stand-alone structure that does not contain a pump tank. As such, this Required Action is not appropriate for this location.

Stopping additions of liquid into the affected pump tank(s) except those necessary to restore ventilation (e.g., flushing of demisters, condensers, reheaters) IMMEDIATELY minimizes the amount of liquid that will be added to the pump tank, and that could have an adverse effect on hydrogen generation rates by dilution of scavengers. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.2

The Note preceding Required Action A.2 states that for ventilation systems that contain two 100% capacity HEPA banks, completion of this Required Action is not required if entry into this Condition is due solely to SR testing required to declare a HEPA filter OPERABLE. This note allows HEPA testing to establish the in-place performance test efficiency required by the SR. In practical terms, an installed HEPA of unknown efficiency provides some measure of protection. The brief period the HEPA filter bank may be declared inoperable during testing does not appreciably elevate the risk of a release event. However, in the unlikely instance where the efficiency test fails, the OPERABLE HEPA filter bank (if available) shall be placed back in service or the Required Action shall be invoked.

Stopping WASTE TRANSFERS associated with the affected diversion box or pump pit minimizes the additional amount of hydrogen generating waste that will be received into the pump tank. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.3

The Note preceding Required Action A.3 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

Isolating the sump transfer jet(s) in the affected diversion box or pump pit(s) from their steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. It also prevents the release of dissolved hydrogen into the affected pump tank caused by the heating of the waste by the jet. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.4

The Note preceding Required Action A.4 states that Required Actions A.4, A.5.1, and A.5.2 are not applicable to HDB-6. HDB-6 is a stand-alone structure that does not share a ventilation system with pump pits. As such, it does not normally store waste and does not contain pump tank agitators, so these Required Actions are not appropriate for this location.

Shutting down agitators and other activities causing mixing in the affected pump tank IMMEDIATELY stops the release of any trapped gas from settled solids in the bottom of the pump tank. It also prevents the agitators from aerosolizing any waste while the ventilation system is in a degraded condition. Normal operation of the pump tank level dip tubes (including normal blow downs) is not considered an activity causing significant mixing of the pump tank for purposes of compliance with this LCO and therefore is not prohibited by this Required Action.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.5.1

Purging the vapor space of the affected transfer facility (pump tanks, pump pits, and diversion box that are collocated within the same structure) within 14 Days and every 14 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the transfer facility. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of the transfer facility (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning purge durations for transfer facilities can be found in the ERD (Ref. 7).

The 14-Day initial and recurring Completion Times are sufficient to prevent flammable conditions from developing in the transfer facility.

(continued)

ACTIONS (continued)

A.5.2

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in the affected pump tank(s) or pump pit(s) within 14 Days and every 14 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the transfer facility.

The 14-Day initial and recurring Completion Times are based on engineering judgment and are considered sufficient to trend hydrogen concentration. Temporary hydrogen transients in excess of 15% of the LFL are insufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

A.6

Restoring compliance with this LCO within 30 Days limits the period during which the transfer facility ventilation system is allowed to be in a degraded condition.

The Completion Time of 30 Days is considered acceptable because actions have been completed to stabilize conditions in the pump tanks and either forced ventilation has been provided by alternate means or the hydrogen concentration has been demonstrated to be within an acceptable range.

The Note preceding Required Action B.1 states that upon entry into Condition B, Required Action B.5 shall be completed. This ensures that the hydrogen concentration in the transfer facility is returned to a low value before this LCO Condition is exited. The Note preceding Condition B states this Condition is not applicable to jetted transfers from the Canyons or from a source of less than or equal to 1200 gallons.

B.1

Stopping additions of liquid into the affected pump tank(s) except those necessary to restore ventilation (e.g., flushing of demisters, condensers, reheaters) IMMEDIATELY minimizes the amount of liquid that will be added to the pump tank, and that could have an adverse effect on hydrogen generation rates by dilution of scavengers. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

B.2

Stopping WASTE TRANSFERS associated with the affected pump pit(s) minimizes the additional amount of hydrogen generating waste that will be received into the pump tank. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.3

The Note preceding Required Action B.3 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

Isolating the sump transfer jet(s) in the affected pump pit(s) from their steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. It also prevents the release of dissolved hydrogen into the affected pump tank caused by the heating of the waste by the jet. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.4

Shutting down agitators and other activities causing mixing in the affected pump tank IMMEDIATELY stops the release of any trapped gas from settled solids in the bottom of the pump tank. It also prevents the agitators from aerosolizing any waste while the ventilation system is in a degraded condition. Normal operation of the pump tank level dip tubes (including normal blow downs) is not considered an activity causing significant mixing of the pump tank for purposes of compliance with this LCO and therefore is not prohibited by this Required Action.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

B.5

Ensuring adequate exhaust flow on the affected pump tank within the Recovery Time of Figure 3.7.5-1 ensures that the required flow will be provided to the pump tank prior to the time that flammable conditions could be reached in the pump tank. Notes for Figure 3.7.5-1 require that a conservative volume be used in determining Recovery Times. The Completion Time is conservatively based on a maximum pump tank volume and the minimum time required by Figure 3.7.5-1, since jetted transfer receipts were ongoing at the time of LCO entry.

The Note preceding Condition C states that this Condition is not applicable to ventilation systems that have only one installed exhaust HEPA filter. This Condition allows shifting to an OPERABLE standby filter when multiple exhaust HEPA filters are available in the system; therefore, it is not applicable to those systems with only one filter. If the exhaust HEPA filter is declared inoperable on a ventilation system that has only one installed filter, then Condition A or B of this LCO shall be entered.

C.1

Placing an OPERABLE exhaust HEPA filter in service IMMEDIATELY minimizes the time that an unfiltered ventilation exhaust stream condition potentially exists. This Required Action allows shifting to an OPERABLE standby exhaust HEPA filter (and removing the inoperable exhaust HEPA filter from service) when a standby HEPA is available in the system.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

If this Required Action is not met and the Completion Time is not met, Condition A or B of this LCO is entered also (Condition C remains applicable).

(continued)

SURVEILLANCE REQUIREMENTS

4.7.5.1 Verifying exhaust flow is greater than or equal to the value stated in Table 3.7.5-2 ensures that sufficient purge flow is provided through these facilities to maintain flammable vapor concentration in the vapor space less than or equal to 25% of the LFL.

The frequency of 24 Hours is based on the maximum analyzed hydrogen release rate in the pump tanks during periods when the pump tank is not receiving a WASTE TRANSFER from a jet.

While a pump tank is receiving a transfer of greater than 1200 gallons from a jet, excluding transfers from the Canyons, the SR frequency is increased to every 10 Minutes. Performance of this 10-Minute SR shall be the primary duty of the operator assigned the surveillance. The increased frequency of the SR is necessary because of the rate at which dissolved hydrogen can be released into the pump tank due to the effects of jet heating of the waste in the sending tank.

Canyon transfer receipts are exempted from the increased surveillance frequency because the dissolved hydrogen released by the action of a steam jet in the canyon sending tanks will be vented from the canyon waste header to a canyon support system and will not cause an increased rate of hydrogen release in the tank farm's receipt pump tanks (Ref. 1).

Failure to meet or perform this SR requires assuming that the affected exhaust flow is outside of its limits and entering Condition A or B of this LCO, as applicable.

4.7.5.2 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the required exhaust flow indicators stated in Table 3.7.5-2. Performance of this SR ensures that the instrumentation that senses exhaust flow are maintained in a sufficiently accurate condition.

The frequency of 1 Year is consistent with the uncertainty analysis for these instruments (Ref. 2-6).

Failure to meet or perform this SR requires declaring the affected exhaust flow indicator inoperable and entering Condition A or B of this LCO, as applicable.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.7.5.3 An in-place performance test shall be performed every 18 Months on the HEPA filters stated in Table 3.7.5-2. The efficiency of the HEPA filter shall be greater than or equal to 99.5%. The exhaust flow rate of the ventilation system must be greater than or equal to the value stated in Table 3.7.5-2 during the performance test of the HEPA filter.

The frequency of 18 Months is based on the guidance provided in References 8 and 9.

Failure to meet or perform this SR requires declaring the affected HEPA filter inoperable and entering Condition A or B of this LCO if no other OPERABLE HEPA filter is available in the system or entering Condition C of this LCO if another OPERABLE HEPA filter is available in the system.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation F Pump Pit 1 Ventilation Flow Loop: FL-641-000-HV-FI-1532. J-CLC-F-00268, Westinghouse Savannah River Company, Aiken, SC.

3. Instrumentation Uncertainties Evaluation Pump Pits 2 & 3 Ventilation Flow (Purge Exhaust) Loop: FM-241-021-HV-FE-2010. J-CLC-F-00273, Westinghouse Savannah River Company, Aiken, SC.

4. Instrumentation Uncertainties Evaluation H Pump Pits 5 & 6 Ventilation Flow Loop: HM-241-070-HV-FI-2049. J-CLC-H-00757, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation HDB-2 Ventilation Flow (Purge Exhaust) Loop: HL-241-035-HV-FE-2011 (U). J-CLC-H-00787, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation HDB-6 Ventilation Flow (Purge Exhaust) Loop: HL-241-056-HV-FE-2005 (U). J-CLC-H-00788, Westinghouse Savannah River Company, Aiken, SC.

7. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

8. Testing of Nuclear Air Treatment Systems. ASME N510-1989, American Society of Mechanical Engineers, New York, December 1989.

9. Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants. Regulatory Guide 1.52, Office of Nuclear Regulatory Research, USNRC.

B3/4.7 TRANSFER SYSTEMS

B3.7.6 HDB-8 Complex Process Vessel Ventilation System

BASES

BACKGROUND SUMMARY

The HDB-8 Complex consists primarily of five adjacent steel-lined concrete cells interconnected with a pipe chase. The five cells house diversion box HDB-8 and pump tanks HPT-7, HPT-8, HPT-9, and HPT-10.

Any radioactive aqueous caustic wastes contained in pump tanks or leaked to a pump pit or diversion box will continuously produce hydrogen due to the radiolysis of the contained water. Some of the transfer facilities are equipped with installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas.

The HDB-8 Complex Process Vessel Ventilation (PVV) System draws air into the diversion box through a filtered inlet. The air flows through the pipe chase and enters the four pump pits in parallel. From each pump pit, the flow enters the pump tank overflow line, passes through the pump tank, and enters the pump tank exhaust. The four pump tank exhaust lines empty into a common header that directs their combined flow through a condenser, demister, and reheater. The flow path then passes through one of two parallel filters and one of two parallel exhaust fans. Downstream of the exhaust fan, the flow is directed to the building exhaust stack where it is combined with the exhaust from other ventilation systems and dispersed into the atmosphere.

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits transfer facility ventilation systems with purging hydrogen and with filtering radioactive particulate from airborne releases from the facility (Ref. 1).

The HDB-8 Complex PVV System is credited in the following accidents in the safety analysis: Pump Pit and Pump Tank Explosion, Aerosolization Events, Seismic Event, and Loss of Offsite Power (Ref. 1).

(continued)

LCO	This LCO requires that the HDB-8 Complex PVV System be OPERABLE. To be OPERABLE, the ventilation system requires one operating fan generating the required purge flow through the system, a second (standby) fan capable of generating the required purge flow through the system while operating, an intact flow path (e.g., ductwork, filter housing, reheater and condenser shells) from the pump tanks to the fans, and an online exhaust filter capable of removing radioactive particulate from the exhaust stream. This LCO also requires that the HDB-8 Complex PVV System have an OPERABLE exhaust flow indicator with control room alarm and that the exhaust flow rate be greater than or equal to a minimum value. The minimum required value of 234 scfm for exhaust flow is based on the safety analysis value of 17 scfm per pump tank supported by the exhaust system, adjusted for total instrument uncertainty (Ref. 2). Another credited feature of the HDB-8 Complex PVV System is an interlock that detects low flow through the system and automatically starts the standby exhaust fan. The interlock shall also cause the inlet damper on the standby fan to open and the inlet damper on the other fan to close. This prevents reverse flow through the non-operating fan, which would decrease the flow rates through the pump tanks. An OPERABLE interlock will be capable of receiving a low flow signal from the exhaust flow instrument and transmitting signals to the standby fan to start and to the inlet dampers for both fans to reposition.
MODE APPLICABILITY	This LCO applies to pump tanks when the tanks are allowed to contain significant quantities of radioactive waste and when WASTE TRANSFERS into or through pump tanks are allowed. Therefore, this LCO applies to pump tanks in OPERATION and STANDBY MODES.
PROCESS AREA APPLICABILITY	This LCO applies to the pump tanks in the HDB-8 Complex. Ventilation systems for other transfers facilities are addressed by LCO 3.7.5 and LCO 3.7.7. Therefore, this LCO is applicable to HPT-7, HPT-8, HPT-9, and HPT-10.

(continued)

ACTIONS

A.1

The Note preceding Required Action A.1 serves as a reminder that a credited interlock is normally available to perform the Required Action in the case of a single fan failure. If the interlock functions as credited, no further actions are required. Operator action shall be taken as necessary to complete the Required Action if the interlock fails to perform its credited function.

Ensuring that PVV System exhaust flow is greater than or equal to 234 scfm IMMEDIATELY minimizes the time that a low flow condition potentially exists.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition A remains applicable).

A.2

Restoring the inoperable exhaust fan within 30 Days restores compliance with the LCO. The 30-Day Completion Time limits the period during which there is no redundant fan available.

The 30-Day Completion Time is considered acceptable based on the reliability of a single fan and the availability of a control room alarm on low exhaust flow which will prompt operator action to shut down certain processes and to restore exhaust flow.

If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition A remains applicable).

B.1

Stopping additions of liquid into the affected pump tank(s) except those necessary to restore ventilation (e.g., flushing of demister, condenser, reheater) IMMEDIATELY minimizes the amount of liquid that will be added to the pump tank, and that could have an adverse effect on hydrogen generation rates by dilution of scavengers. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

(continued)

ACTIONS (continued)

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.2

The Note preceding Required Action B.2 states that completion of this Required Action is not required if entry into this Condition is due solely to SR testing required to declare a HEPA filter OPERABLE. This note allows HEPA testing to establish the in-place performance test efficiency required by the SR. In practical terms, an installed HEPA of unknown efficiency provides some measure of protection. The brief period the HEPA filter bank may be declared inoperable during testing does not appreciably elevate the risk of a release event. However, in the unlikely instance where the efficiency test fails, the OPERABLE HEPA filter bank (if available) shall be placed back in service or the Required Action shall be invoked.

Stopping WASTE TRANSFERS associated with the affected pump pit IMMEDIATELY minimizes the additional amount of hydrogen generating waste that will be received into the pump tank. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.3

Shutting down agitators and other activities causing mixing in the affected pump tank IMMEDIATELY stops the release of any trapped gas from settled solids in the bottom of the pump tank. It also prevents the agitators from aerosolizing any waste while the ventilation system is in a degraded condition. Normal operation of the pump tank level dip tubes (including normal blow downs) is not considered an activity causing significant mixing of the pump tank for purposes of compliance with this LCO and therefore is not prohibited by this Required Action.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

B.4

The Note preceding Required Action B.4 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

Isolating the sump transfer jet(s) in the affected diversion box or pump pit(s) from their steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. It also prevents the release of dissolved hydrogen into the affected pump tank caused by the heating of the waste by the jet. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.5.1

Ensuring forced ventilation is operating on the affected pump tank(s) within the Recovery Time of Figure 3.7.6-1 or Figure 3.7.6-2, as applicable, ensures that purge flow will be provided to the pump tank(s) prior to the time that flammable conditions could be reached in the pump tank(s). Notes for Figure 3.7.6-1 and Figure 3.7.6-2 require that a conservative volume be used in determining Recovery Times. The recurring Completion Time of 24 Hours is conservatively based on a maximum pump tank volume and the minimum time required by Figure 3.7.6-2, since jetted transfer receipts have been stopped.

(continued)

ACTIONS (continued)

B.5.2

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in the affected pump tank(s) within the Recovery Time of Figure 3.7.6-1 or Figure 3.7.6-2, as applicable, ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the transfer facility. Notes for Figure 3.7.6-1 and Figure 3.7.6-2 require that a conservative volume be used in determining Recovery Times. The recurring Completion Time of 24 Hours is conservatively based on a maximum pump tank volume and the minimum time required by Figure 3.7.6-2, since jetted transfer receipts have been stopped.

Temporary hydrogen transients in excess of 15% of the LFL are insufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

B.6

Restoring compliance with this LCO within 30 Days limits the period during which the ventilation system is allowed to be in a degraded condition.

The Completion Time of 30 Days is considered acceptable because actions have been completed to stabilize conditions in the pump tanks and either forced ventilation has been provided by alternate means or the hydrogen concentration has been demonstrated to be within an acceptable range.

C.1

Stopping additions of liquid into the affected pump tank(s) except those necessary to restore ventilation (e.g., flushing of demister, condenser, reheater) IMMEDIATELY minimizes the amount of liquid that will be added to the pump tank, and that could have an adverse effect on hydrogen generation rates by dilution of scavengers. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

C.2

Stopping WASTE TRANSFERS associated with the affected pump pit IMMEDIATELY minimizes the additional amount of hydrogen generating waste that will be received into the pump tank. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

C.3

Shutting down agitators and other activities causing mixing in the affected pump tank IMMEDIATELY stops the release of any trapped gas from settled solids in the bottom of the pump tank. It also prevents the agitators from aerosolizing any waste while the ventilation system is in a degraded condition. Normal operation of the pump tank level dip tubes (including normal blow downs) is not considered an activity causing significant mixing of the pump tank for purposes of compliance with this LCO and therefore is not prohibited by this Required Action.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

C.4

Ensuring that a PVV System exhaust fan is operating IMMEDIATELY verifies that exhaust flow does exist, even if no instrument is immediately available to quantify the flow rate.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

C.5

Monitoring exhaust flow using an alternate method of flow detection within 24 Hours and every 24 Hours thereafter ensures that an unacceptable decrease in system flow rate is detected in a timely manner. Alternate methods of flow detection include, but are not limited to, portable M&TE connected to the pressure taps for the normal flow instrument. In the event that the credited control room alarm is inoperable in a manner that does not affect a local indicator of the same INSTRUMENT LOOP, the local flow indication may be used to perform this Required Action.

The 24-Hour initial and recurring Completion Times are considered acceptable because actions have been completed to stabilize conditions in the pump tanks and verify exhaust fan operation.

If this Required Action is not met and the Completion Times are not met, Condition B of this LCO is entered also (Condition C remains applicable).

C.6

Restoring the exhaust flow indicator / alarm / interlock to OPERABLE status within 30 Days restores compliance with the LCO. The 30-Day Completion Time limits the period limits the period during which an alternate means of exhaust flow measurement is relied upon.

D.1

Placing an OPERABLE exhaust HEPA filter in service IMMEDIATELY minimizes the time that an unfiltered ventilation exhaust stream condition potentially exists. This Required Action allows shifting to an OPERABLE standby exhaust HEPA filter (and removing the inoperable exhaust HEPA filter from service) when a standby HEPA is available in the system.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition D remains applicable).

(continued)

SURVEILLANCE REQUIREMENTS

4.7.6.1 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the required exhaust flow loop including the control room alarm. Performance of this SR ensures that the instrumentation that senses exhaust flow and provides the control room alarm and input to the interlock loop required by Table 3.7.6-1 is maintained in a sufficiently accurate condition. The frequency of 1 Year is consistent with the uncertainty analysis for this instrument (Ref. 2).

Failure to meet or perform this SR requires declaring the affected exhaust flow loop inoperable and entering Condition C of this LCO.

4.7.6.2 An INSTRUMENT LOOP TEST of the hardwired interlock functions stated in Table 3.7.6-1 for the PVV System low exhaust flow interlock shall be performed every 1 Year to ensure the OPERABILITY of the interlock circuitry. This test shall verify with simulated input signal that the required equipment receives the proper signal to direct the actions outlined in the footnote of Table 3.7.6-1. A successful completion of this test will ensure the required equipment receives the signal directing the actions required by this interlock at a SETPOINT within the requirements of Table 3.7.6-1.

The 1-Year surveillance frequency is considered adequate to track and trend the instrument performance and is based on equipment reliability.

Failure to meet or perform this SR requires declaring the affected interlock inoperable and entering Condition C of this LCO.

4.7.6.3 The standby exhaust fan shall be verified every 1 Year to start, and associated inlet damper realignment, when directed by a simulated or actual interlock signal. This SR verifies that this fan (and dampers) performs the necessary action when an interlock requires this fan to start.

The 1-Year surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR requires declaring the affected equipment inoperable and entering Condition A, B, and/or C of this LCO.

4.7.6.4 An in-place performance test shall be performed every 18 Months on the HEPA filters stated in Table 3.7.6-1. The efficiency of the HEPA filter shall be greater than or equal to 99.5%. The exhaust flow rate of the ventilation system must be greater than or equal to the value stated in Table 3.7.6-1 during the performance test of the HEPA filter.

The frequency of 18 Months is based on the guidance provided in References 3 and 4.

Failure to meet or perform this SR requires declaring the affected HEPA filter inoperable and entering Condition B of this LCO if no other OPERABLE HEPA filter is available in the system or entering Condition D of this LCO if another OPERABLE HEPA filter is available in the system.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation H-Area Pump Pits 7 – 10 Ventilation Flow Loop: HG-241-101-PVV-FE-7050 (U). J-CLC-H-00789, Westinghouse Savannah River Company, Aiken, SC.

3. Testing of Nuclear Air Treatment Systems. ASME N510-1989, American Society of Mechanical Engineers, New York, December 1989.

4. Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants. Regulatory Guide 1.52, Office of Nuclear Regulatory Research, USNRC.

B3/4.7 TRANSFER SYSTEMS

B3.7.7 HDB-7 Ventilation System

BASES

BACKGROUND SUMMARY	The Waste Transfer System includes pump tanks and diversion boxes to allow for flexible configurations of TRANSFER PATHS. Not all TRANSFER PATHS include pump pits or diversion boxes. HBD-7 is equipped with a forced ventilation system. This ventilation purges the vapor space of the diversion box and minimizes the release of radioactive contamination. The HDB-7 Ventilation System includes an exhaust fan and an exhaust filter.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits the HDB-7 Ventilation System with purging hydrogen and with filtering radioactive particulate from airborne releases from the facility (Ref. 1). The HDB-7 Ventilation System is credited in the following accidents in the safety analysis: Transfer Facility Explosions and Aerosolization Events (Ref. 1).
LCO	This LCO requires that the HDB-7 Ventilation System be OPERABLE. To be OPERABLE, the ventilation system requires an operating fan generating the required purge flow through the system, an intact flow path (e.g., ductwork, filter housing) from the diversion box to the fan, and an online exhaust filter capable of removing radioactive particulate from the exhaust stream. This LCO also requires that the HDB-7 Ventilation System have an OPERABLE exhaust flow indicator and that the exhaust flow rate be greater than or equal to a minimum value. The minimum required value of 71 scfm for exhaust flow is based on the amount needed to maintain a flammable vapor concentration of less than or equal to 25% of the LFL within the structure (31 scfh) and component limitations (i.e., ventilation system capacity and flow indication range). This flow is also adjusted for total instrument uncertainty (Ref. 2).

(continued)

MODE APPLICABILITY	This LCO applies to certain transfer lines when HIGH-REM WASTE TRANSFERS are allowed through those lines. HIGH-REM WASTE TRANSFERS are only allowed in HIGH-REM TRANSFER MODE. This LCO also applies to HDB-7 transfer lines when ESP SLUDGE SLURRY is transferred through those lines. ESP SLUDGE SLURRY transfers are allowed in HIGH-REM TRANSFER and OPERATION MODES. Therefore, this LCO applies to the specified transfer lines in HIGH-REM TRANSFER MODE and during OPERATION MODE during ESP SLUDGE SLURRY transfers associated with HDB-7. The applicability of this LCO is dependent on the type of waste allowed to be transferred through transfer lines, not on the characteristics of the liquid believed to be in the sump. The DSA requires forced ventilation for HDB-7 any time a HIGH-REM TRANSFER or an ESP SLUDGE SLURRY transfer could leak into the diversion box (Ref. 1). During a HIGH-REM TRANSFER or an ESP SLUDGE SLURRY transfer, HDB-7 is perceived to have a higher risk due to potential leakage into the sump while the transfer transits the diversion box. The DSA also requires forced ventilation for HDB-7 any time that its sump is jetted (Ref. 1). This LCO is limited to HIGH-REM TRANSFER MODE during sump jetting because that period is perceived to have the highest risk due to potential sparging of sump contents. Jetting of sump contents during other periods will have HDB-7 ventilation administratively controlled under the Transfer Control Program.
PROCESS AREA APPLICABILITY	This LCO is applicable to transfer lines for which HDB-7 is a credited LEAK DETECTION LOCATION. Ventilation systems for other transfer facilities are addressed by LCO 3.7.5 and LCO 3.7.6.

(continued)

ACTIONS

The Note preceding Required Action A.1 states that upon entry into Condition A, Required Action A.3, (i.e., A.3.1 or A.3.2), shall be completed. This ensures that the hydrogen concentration in HDB-7 is returned to a low value before this LCO Condition is exited.

A.1

Stopping WASTE TRANSFERS associated with HDB-7 minimizes the additional amount of hydrogen generating waste that will be received into the diversion box. It also maximizes the vapor space in the transfer facility, which maximizes the time needed to reach flammable conditions.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.2

The Note preceding Required Action A.2 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

Isolating the sump transfer jet in the HDB-7 sump from its steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.3.1

Purging the vapor space of HDB-7 within 14 Days and every 14 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of HDB-7 (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning the purge duration for HDB-7 can be found in the ERD (Ref. 3).

The 14-Day initial and recurring Completion Times are sufficient to prevent flammable conditions from developing in HDB-7.

A.3.2

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in HDB-7 within 14 Days and every 14 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space.

The 14-Day initial and recurring Completion Times are based on engineering judgment and are considered sufficient to trend hydrogen concentration. Temporary hydrogen transients in excess of 15% of the LFL are insufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

A.4

Restoring compliance with this LCO within 30 Days limits the period during which the HDB-7 ventilation system is allowed to be in a degraded condition.

The Completion Time of 30 Days is considered acceptable because actions have been completed to stabilize conditions in HDB-7 and either forced ventilation has been provided by alternate means or the hydrogen concentration has been demonstrated to be within an acceptable range.

(continued)

SURVEILLANCE REQUIREMENTS

4.7.7.1 Verifying exhaust flow is greater than or equal to the value stated in Table 3.7.7-1 ensures that sufficient purge flow is provided through HDB-7 to maintain flammable vapor concentration in the vapor space less than or equal to 25% of the LFL. The frequency of 24 Hours is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected exhaust fan inoperable and entering Condition A of this LCO.

4.7.7.2 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the required exhaust flow indicator stated in Table 3.7.7-1. Performance of this SR ensures that the instrumentation that senses exhaust flow is maintained in a sufficiently accurate condition.

The frequency of 1 Year is consistent with the uncertainty analysis for these instruments (Ref. 2)

Failure to meet or perform this SR requires declaring the exhaust flow indicator inoperable and entering Condition A of this LCO.

4.7.7.3 An in-place performance test shall be performed every 18 Months on the HEPA filters stated in Table 3.7.7-1. The efficiency of the HEPA filter shall be greater than or equal to 99.5%. The exhaust flow rate of the ventilation system must be greater than or equal to the value stated in Table 3.7.7-1 during the performance test of the HEPA filter.

The frequency of 18 Months is based on the guidance provided in References 4 and 5.

Failure to meet or perform this SR requires declaring the affected HEPA filter inoperable and entering Condition A of this LCO if no other OPERABLE HEPA filter is available in the system.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation Ventilation Flow HDB-7 (Purge Exhaust) (U). J-CLC-H-00867, Westinghouse Savannah River Company, Aiken, SC.

3. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

4. Testing of Nuclear Air Treatment Systems. ASME N510-1989, American Society of Mechanical Engineers, New York, December 1989.

5. Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants. Regulatory Guide 1.52, Office of Nuclear Regulatory Research, USNRC.

B3/4.7 TRANSFER SYSTEMS

B3.7.8 Pump Tank Pulse Tube Agitator Interlock

BASES

BACKGROUND SUMMARY	FPT-1 is equipped with a Pulse Tube Agitator. The agitator is designed to suspend and mix solids with liquid supernate. The agitator consists of three primary components: 1) charge vessel; 2) primary controller (jet pump pair); and 3) secondary controller (computer control unit). The primary controller creates a partial vacuum in the charge vessel, drawing liquid from the pump tank into the charge vessel. Once the charge vessel is filled, the primary controller pressurizes the charge vessel, driving the liquid back into the pump tank. The charge vessel is then depressurized and the process is repeated. The secondary controller regulates the supply (and duration) of compressed air to the primary controller during the filling and emptying of the charge vessel. It also switches off the compressed air supply to the primary controller for venting of the charge vessel. The supply of compressed air to the agitator's jet pump pair is from a portable compressor. The portable compressor is connected to the system with a flexible hose during agitator operation.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits the low pump tank level interlock with preventing sparging of waste in a pump tank due to Pulse Tube Agitator operation (Ref. 1). The Pulse Tube Agitator interlock is credited in the following accident in the safety analysis: Aerosolization Events (Ref. 1).

(continued)

LCO	This LCO requires that the Pulse Tube Agitator pump tank low level interlock be OPERABLE. The OPERABLE interlock must be capable of detecting a low level condition in the pump tank and isolating the air supply to the Pulse Tube Agitator. The interlock to shutdown the Pulse Tube Agitator must actuate at a low-level SETPOINT of greater than or equal to 22 inches WC. The SETPOINT value is based on maintaining a liquid cover of 9 inches over the Pulse Tube Agitator discharge nozzle (Ref. 1). The 22-inch WC SETPOINT accounts for the Pulse Tube Agitator discharge nozzle being 6.5 inches below the bottom of the weight factor leg dip tube and a specific gravity of 1.6 for the waste. The required SETPOINT was adjusted to account for total instrument uncertainty (Ref. 2). For the pump tank low level interlock to be OPERABLE, the level instrument for the pump tank must be provided air flow at a rate within the limits of the instrument's uncertainty analysis. In order to maintain actual air flow to the instrument within the required range, the indicated air flow must be within the values stated in Table 3.7.8-1 (Ref. 2).
MODE APPLICABILITY	This LCO is applicable any time that FPT-1 contains waste and operation of the FPT-1 Pulse Tube Agitator is possible. Operation of all pump tank agitators is prohibited in STANDBY MODE. Because the FPT-1 Pulse Tube Agitator is driven from a portable air compressor, there is no potential for an event occurring while the compressor is disconnected from the Pulse Tube Agitator. Therefore, this LCO is applicable in OPERATION MODE, while a portable air compressor is connected to the FPT-1 Pulse Tube Agitator.
PROCESS AREA APPLICABILITY	This LCO is applicable to all pump tanks containing Pulse Tube Agitators. Because FPT-1 is the only pump tank containing a Pulse Tube Agitator, this LCO is applicable to only FPT-1.

(continued)

ACTIONS

A.1

Restoring the affected air flow to within the values stated in Table 3.7.8-1 IMMEDIATELY restores the level instrument and interlock loop to within the limits of the uncertainty analysis. The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.2.1

Shutting down the Pulse Tube Agitator IMMEDIATELY stops any potential sparging of waste in the pump tank. The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.2.2

Disconnecting the portable air compressor from the FPT-1 Pulse Tube Agitator within 24 Hours ensures that the Pulse Tube Agitator is not inadvertently operated. The Completion Time of 24 Hours is based on engineering judgment and provides sufficient time to complete the Required Action in a controlled manner. Because disconnecting the portable air compressor precludes sparging of waste by the agitator, completion of this Required Action allows exiting the MODE Applicability of this LCO and no further actions are required.

B.1

Shutting down the Pulse Tube Agitator IMMEDIATELY stops any potential sparging of waste in the pump tank. The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.2

Disconnecting the portable air compressor from the FPT-1 Pulse Tube Agitator within 24 Hours ensures that the Pulse Tube Agitator is not inadvertently operated. The Completion Time of 24 Hours is based on engineering judgment and provides sufficient time to complete the Required Action in a controlled manner. Because disconnecting the portable air compressor precludes sparging of waste by the agitator, completion of this Required Action allows exiting the MODE Applicability of this LCO and no further actions are required.

(continued)

SURVEILLANCE REQUIREMENTS

4.7.8.1 Verifying that air flow to the pump tank level instrument weight factor and reference leg flow indicators is within the values stated in Table 3.7.8-1 every 24 Hours ensures that adequate flow exists for the level instrument to read accurately. The 24-Hour surveillance frequency is based on engineering judgment. Performance of this SR is required after dip tube flushing/blowdown prior to declaring the loop OPERABLE.

Failure to meet or perform this SR requires assuming that the affected air flow is outside of its limits and entering Condition A of this LCO.

4.7.8.2 Performance of an INSTRUMENT LOOP CHECK on the pump tank level instrument every 24 Hours ensures that a gross failure of the instrument has not occurred. The frequency of 24 Hours is based on operating experience and engineering judgment. Performance of this SR is required after dip tube flushing/blowdown prior to declaring the loop OPERABLE.

Failure to meet or perform this SR requires declaring the affected pump tank level instrument inoperable and entering Condition B of this LCO.

4.7.8.3 An INSTRUMENT LOOP TEST of the hardwired interlock functions stated in Table 3.7.8-1 for the FPT-1 low level interlock shall be performed every 90 Days to ensure the OPERABILITY of the interlock circuitry. This test shall verify with simulated input signal that the required equipment receives the proper signal to direct the actions outlined in the footnotes of Table 3.7.8-1. A successful completion of this test will ensure the required equipment receives the signal directing the actions required by this interlock at a SETPOINT within the requirements of Table 3.7.8-1.

The 90-Day surveillance frequency is considered adequate to track and trend the instrument performance and is based on equipment reliability.

Failure to meet or perform this SR requires declaring the affected interlock inoperable and entering Condition B of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.7.8.4 The Pulse Tube Agitator Main Air Flow Valve shall be verified every 90 Days to close when directed by a simulated or actual interlock signal. This SR verifies that this valve performs the necessary action when an interlock requires this valve to close.

The 90-Day surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

Failure to meet or perform this SR requires declaring the affected valve inoperable and entering Condition B of this LCO.

4.7.8.5 An INSTRUMENT LOOP CHECK shall be performed on the weight factor and reference leg flow indicators stated in Table 3.7.8-1 every 180 Days. Performing an INSTRUMENT LOOP CHECK ensures that a gross failure of the instrument has not occurred. The INSTRUMENT LOOP CHECK shall include a verification that indicated flow drops below the lowest non-zero division on the scale when air flow through the rotameter is isolated. Indicated flow dropping below this value ensures that foreign material or deposits within the rotameter are not preventing the rotameter from indicating low flow conditions.

The 180-Day surveillance frequency is based on operating experience and engineering judgment and is considered adequate to monitor adverse trends in instrumentation performance.

Failure to meet or perform this SR requires declaring the affected flow indicator inoperable and entering Condition B of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.7.8.6 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the pump tank level instrument. Performance of this SR ensures that the level instrumentation that senses tank level and provides input to the interlock loop required by Table 3.7.8-1 is maintained in a sufficiently accurate condition. The frequency of 1 Year is consistent with the uncertainty analysis for this instrument (Ref. 2).

Failure to meet or perform this SR requires declaring the affected pump tank level instrument inoperable and entering Condition B of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation F Pump Tank 1 – Pulse Tube Agitator System Weight Factor Input: FL-641-000-IT-LT-6087. J-CLC-F-00306, Westinghouse Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.9 Area Radiation Monitoring – Above-Ground Transfer Lines

BASES

BACKGROUND SUMMARY

High level waste is transferred through the CST Facilities through transfer lines and jumpers. The majority of these transfer lines are located underground or in concrete structures that provide secondary containment. In certain locations, sections of transfer lines are located above ground. Although these above-ground transfer lines are contained in steel jackets and are typically surrounded by radiation shielding (e.g., lead), these transfer lines are more vulnerable to certain accident initiators than underground transfer lines. If an event were to breach both the transfer line jacket and its core pipe, leaked waste may not reach any leak detection conductivity probes.

Area Radiation Monitors (ARMs) are positioned to support transfers through above-ground transfer lines in accordance with the ARM Location Program.

There are three types of ARMs that monitor the above-ground transfer lines. The ARM types include:

- Hardwired – permanent ARM with local indication and remote control room alarm capability.
- Portable – local indication only. Does not have control room alarm capability.
- Wireless – ARM with local indication that houses a transmitter for remote control room alarm capability.

These ARMs provide adequate coverage to detect a significant above-ground leak from the Waste Transfer System. These instruments are used to detect leaks and alarm to alert the operators to unusual conditions. The ARM Location Program determines the alarm requirements (e.g., control room, local) for each of the required ARMs.

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits ARMs with detecting leakage from an above-ground transfer line (Ref. 1). The ARMs allow control room notification capabilities for waste releases to initiate operator actions to mitigate the release. This function is required during HIGH-REM WASTE TRANSFERS.

(continued)

APPLICATION TO SAFETY ANALYSIS (continued)	Area Radiation Monitors for above-ground transfer lines are credited in the following accident in the safety analysis: Transfer Error/SMP Waste Release (Ref. 1).
LCO	This LCO specifies that the hardwired, portable, and/or wireless ARMs specified in accordance with the ARM Location Program as required to provide coverage for above-ground transfer lines shall be OPERABLE. An OPERABLE ARM shall be capable of detecting area radiation levels and alerting operators (e.g., control room alarm, local alarm) when a pre-determined SETPOINT is reached. The ARM Location Program determines the necessary ARM positioning required to support HIGH-REM WASTE TRANSFERS through above-ground transfer lines and excavated transfer lines and determines the alarm requirements (e.g., control room and/or local) for each ARM. The alarm SETPOINTS of the ARMs shall be established and adjusted in accordance with the standard practices of the Radiological Protection Program. During SETPOINT changes to the hardwired and wireless ARMs, the ARM shall not be considered inoperable, as the SETPOINT change is virtually instantaneous. The ARM Location Program will consider appropriate parameters (e.g., area topography, rem/gallon of transferred waste, shielding obstructions between potential leak locations and ARM locations) when determining the number and position of ARMs necessary for that transfer.
MODE APPLICABILITY	Area Radiation Monitors are required to be OPERABLE whenever a HIGH-REM WASTE TRANSFER has the potential to leak waste from an above-ground transfer line. HIGH-REM WASTE TRANSFERS are only allowed in HIGH-REM TRANSFER MODE. Therefore, this LCO is applicable in HIGH-REM TRANSFER MODE.
PROCESS AREA APPLICABILITY	This LCO applies to above-ground transfer lines in all TRANSFER PATHS. For the purposes of determining the applicability of this LCO, above-ground transfer lines include both those transfer lines designed to be permanently above ground, and also transfer lines that are temporarily exposed due to excavations.

(continued)

ACTIONS

The first Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if instrumentation or radiation level does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

A.1

Stopping WASTE TRANSFERS, except RECOVERY TRANSFERS, through above-ground lines associated with the affected area radiation monitoring location(s) IMMEDIATELY minimizes the amount of additional waste likely to leak to that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support restoration of the affected location are not prohibited.

A.2

Performing the MODE change directed by this Required Action removes the affected PROCESS AREA from the MODE Applicability of this LCO. Placing the affected transfer lines in OPERATION MODE within 14 Days limits the period of time during which the PROCESS AREAS remain in a MODE that does not restrict HIGH-REM WASTE TRANSFERS.

SURVEILLANCE REQUIREMENTS

4.7.9.1 Verifying the alarm status of portable ARMs every 15 Minutes ensures that a high radiation condition detected by an ARM is communicated to the control room, allowing mitigative actions to be initiated.

Failure to meet or perform this SR for a specific portable ARM requires assuming that the affected ARM radiation level is outside of its limits and entering Condition A of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.7.9.2 Verifying that the indicated radiation levels on the hardwired and portable ARMs are within the range of the meter every 24 Hours ensures that a gross failure of the instrument has not occurred. The hardwired and portable ARMs are designed to maintain an on-scale reading, even in the absence of an external radiation source.

Failure to meet or perform this SR for a specific hardwired ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

4.7.9.3 Performance of an INSTRUMENT LOOP TEST on each required wireless ARM every 24 Hours ensures that the instruments are capable of detecting an increased radiation level and annunciating it in the applicable control room. This SR is not applicable to a hardwired or portable ARM. The INSTRUMENT LOOP TEST ensures that a gross failure of the INSTRUMENT LOOP has not occurred. The wireless ARM shall not be considered inoperable or in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 24 Hours is based on engineering judgment.

Failure to meet or perform this SR for a specific wireless ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

4.7.9.4 Performance of a SOURCE CHECK on the ARMs ensures that the instruments are capable of providing required alarms to warn personnel of increasing radiation levels. The ARM shall not be considered inoperable or in alarm status during performance of the SOURCE CHECK. The 90-Day surveillance frequency is adequate to ensure that the ARMs are capable of detecting the events that they are credited for in the safety analysis.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR for a specific ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

4.7.9.5 Performance of an INSTRUMENT LOOP CALIBRATION on the ARMs ensures that the instruments are accurately sensing and indicating radiation levels. The 1-Year surveillance frequency is based on engineering judgment.

Failure to meet or perform this SR for a specific ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.10 LDB, MLDB, LPS, Tank Risers

BASES

BACKGROUND SUMMARY	The Waste Transfer System is designed to prevent above-ground release of the waste being transferred. Many system components are designed to direct any leakage to either a waste storage tank or to a LEAK DETECTION LOCATION. These locations include pump pit sumps, diversion box sumps, valve boxes, drain valve boxes, the HPFP, LDBs, MLDBs, LPSs, tank risers, cell sumps, and tank annuli. Any radioactive aqueous caustic wastes leaked to these locations will continuously produce hydrogen due to the radiolysis of the contained water. Some of the LEAK DETECTION LOCATIONS are equipped with installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas. Conductivity probes are located in the LDBs, MLDBs, LPSs, and tank risers (that have the potential for pluggage). These instruments are used to detect leaks and alarm to alert the operators to unusual conditions. The conductivity probes have alarms in their applicable control room.
APPLICATION TO SAFETY ANALYSIS	The safety analysis (Ref. 1) credits the conductivity probes in the LDBs, MLDBs, LPSs, and tank risers and their associated control room alarms. The probes and alarms are credited with alerting control room operators to liquid in a LEAK DETECTION LOCATION. The operator is then able to take action before the event results in a significant surface release. It also allows timely removal of the waste to prevent/mitigate explosions. The LDB/MLDB/LPS/tank riser leak detection instruments are credited in the following accidents in the safety analysis: Transfer Facility Explosions and Transfer Error/SMP Waste Release (Ref. 1).

(continued)

LCO	This LCO requires that the waste level in LDBs, MLDBs, LPSs, and tank risers be less than or equal to the values stated in Table 3.7.10-1. The volume of waste allowed to accumulate in LDBs, MLDBs, LPSs, and tank risers is limited to the volume in the location below the height of the leak detection conductivity probe. This allows the conductivity probe to detect an increasing level in the LEAK DETECTION LOCATION that would occur due to a leak and alert the operators to allow for timely mitigative actions. This LCO also requires that one leak detection instrument stated in Table 3.7.10-1 be OPERABLE in a LDB/MLDB/LPS/tank riser. An OPERABLE leak detection instrument must be capable of detecting an increase in liquid level above the required SETPOINT of the probe and alarming in the control room to alert operators to the condition. The required SETPOINTS of Table 3.7.10-1 allow the conductivity probe to detect an increasing level in the LEAK DETECTION LOCATION (no specific safety analysis value is required to be protected). It is not necessary to consider an alarming leak detection instrument inoperable, unless it is determined that the alarm has been caused by a failure of the instrument. An alarming conductivity probe has performed its function of alerting operators to a high level condition, and the conductivity probe is not required to subsequently perform any other credited function until level is subsequently reduced below the SETPOINT of the conductivity probe.
MODE APPLICABILITY	For transfer lines associated with LDBs, MLDBs, LPSs, and tank risers, leak detection instruments are required to be OPERABLE whenever high inhalation dose potential material is permitted to be transferred through the location being supported by the leak detection instrumentation. Therefore, this LCO is applicable to transfer lines in HIGH-REM TRANSFER MODE.

(continued)

PROCESS AREA APPLICABILITY

This LCO applies to the PROCESS AREAS that can leak waste to the specified LEAK DETECTION LOCATIONS.

Therefore, this LCO applies to transfer lines for which the LDBs, MLDBs, LPSs, and tank risers stated in Table 3.7.10-1 are credited LEAK DETECTION LOCATIONS.

This LCO is not applicable to LEAK DETECTION LOCATIONS in F-Area Tank Farm because the associated transfer lines are not allowed to be placed in HIGH-REM TRANSFER MODE. This LCO is not applicable to LDBs at the HDB-8 Complex because the drain headers from those LDBs to HPP-7/HDB-8 are adequate to credit the conductivity probes in the HDB-8 Complex sumps with detecting leakage from the transfer lines associated with the LDBs that overflow/drain to the sumps.

ACTIONS

The Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if waste level does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

A.1

Stopping WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION IMMEDIATELY minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location are not prohibited.

A.2

Ensuring that the waste level in the affected LEAK DETECTION LOCATION is less than or equal to the stated value prior to restarting a WASTE TRANSFER ensures that a subsequent increase in waste level can be detected and responded to.

(continued)

ACTIONS (continued)

The Note preceding Required Action B.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if instrumentation does not meet the requirements of this LCO, to support RECOVERY TRANSFERS.

B.1

Stopping WASTE TRANSFERS, except for RECOVERY TRANSFERS, associated with the affected LEAK DETECTION LOCATION IMMEDIATELY minimizes the amount of additional waste likely to leak into that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing RECOVERY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying the affected location are not prohibited.

B.2

The Note preceding Required Action B.2 states that upon initial completion of the Required Action, WASTE TRANSFERS which were in progress and temporarily stopped at the time Condition B was entered, may be completed. Allowing completion of the transfers is appropriate because an alternate method is in use to compensate for the inoperable leak detection instrument.

Verifying that the waste level in the affected LEAK DETECTION LOCATION is less than or equal to the stated value prior to restarting a WASTE TRANSFER ensures that a subsequent increase in waste level can be detected and responded to. Using an alternate monitoring device with control room notification capability provides an appropriate compensatory measure for allowing the transfer to continue for a limited period of time with the normal leak detection instrument inoperable. Administrative Control 5.8.2.7 is applicable to the instrumentation used to perform this alternate monitoring.

(continued)

ACTIONS (continued)

Following the initial performance, repeating the Required Action every 15 Minutes ensures that excessive liquid accumulation in the LEAK DETECTION LOCATION is detected without significant delay. If the WASTE TRANSFER is not restarted, completion of this Required Action is not necessary.

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition B remains applicable).

B.3

Performing the MODE change directed by this Required Action removes those transfer lines from the MODE Applicability of this LCO. Placing the transfer lines associated with the affected LEAK DETECTION LOCATION in OPERATION MODE within 14 Days limits the period of time during which the PROCESS AREAS remain in a MODE that does not restrict HIGH-REM WASTE TRANSFERS.

The Completion Time of 14 Days is considered sufficient to complete any HIGH-REM WASTE TRANSFER that was in progress when this LCO was entered.

SURVEILLANCE REQUIREMENTS

4.7.10.1 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 7 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 7 Days is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)	4.7.10.2	Conductivity probes are verified to be set at or below the value stated in Table 3.7.10-1 every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment. Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO.
REFERENCES	1.	Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.11 LDB Drain Cell

BASES

BACKGROUND SUMMARY

The Waste Transfer System is designed to prevent above-ground release of the waste being transferred. Many system components are designed to direct any leakage to either a waste storage tank or to a LEAK DETECTION LOCATION. These locations include pump pit sumps, diversion box sumps, valve boxes, drain valve boxes, the HPFP, LDBs, MLDBs, LPSs, tank risers, cell sumps, and tank annuli. LDBs on the south end of the East Hill in H-Area Tank Farm overflow to leak detection headers that typically drain to the LDB Drain Cell (241-236H).

Any radioactive aqueous caustic wastes leaked to the LDB Drain Cell will continuously produce hydrogen due to the radiolysis of the contained water.

APPLICATION TO SAFETY ANALYSIS

An assumption of the accident analysis is that at the start of certain events, the amount of waste already outside of primary containment in the LDB Drain Cell is a small fraction of the total volume of the structure. A limited waste inventory in the LDB Drain Cell prior to an event is assumed in the following accidents in the safety analysis: Transfer Facility Explosions and Transfer Error/SMP Waste Release (Ref. 1).

LCO

This LCO requires that the waste level in the LDB Drain Cell be less than or equal to the value stated in Table 3.7.11-1.

The amount of waste in the LDB Drain Cell is limited to 1.29% of the available volume of the structure. This is based on maintaining the hydrogen concentration in this location less than or equal to 25% of the LFL, assuming that the waste present in the location has the maximum hydrogen generation rate used in the accident analysis, and considering the effects of atmospheric breathing (Ref. 2, 3).

No specific method of measuring waste volumes is required by this LCO. Because the LDB Drain Cell is normally monitored by a conductivity probe, the table of this LCO provides information concerning the maximum conductivity probe height, including the effects of instrument uncertainty, that ensure that a conductivity probe would alarm upon increasing sump level no later than the time at which that location reached the allowed value in the analysis (Ref. 4, 5).

(continued)

LCO (continued)	If a method of measurement is used other than conductivity probes (e.g., dip tubes, visual/camera confirmation using available landmarks), then an uncertainty allowance associated with that method will be subtracted from the allowed value of the analysis when determining the acceptable observed value associated with using that method.
MODE APPLICABILITY	This LCO is applicable any time that waste could accumulate in the LDB Drain Cell. Although this is most likely to occur during transfers of waste, some locations receive drainage from lengthy sections of pipe jackets where the transit time for the waste to actually reach a LEAK DETECTION LOCATION is indeterminate. Also, it is possible for relatively small amounts of waste to be flushed or drained into LEAK DETECTION LOCATIONS while transfers are not in progress. Therefore, this LCO is applicable in All MODES.
PROCESS AREA APPLICABILITY	This LCO applies to transfer lines for which the credited LEAK DETECTION LOCATIONS (e.g., LDBs) are connected to the LDB Drain Cell.
ACTIONS	The Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to MODE changes required to allow RECOVERY TRANSFERS. This Note allows MODE changes to be performed, even if waste level does not meet the requirements of this LCO, to support RECOVERY TRANSFERS. A.1 Ensuring that the waste level in the LDB Drain Cell is less than or equal to the stated value within 48 Hours is intended to limit the time during which the waste levels exceed those assumed in the analysis. Stopping transfers in response solely to a high level in the LDB Drain Cell is not required because the pathways that could potentially direct waste from primary containment (i.e., transfer lines) to the LDB Drain Cell are designed to detect leakage prior to allowing it into the Drain Cell (i.e., at the LDB). If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition A remains applicable).

(continued)

ACTIONS (continued)

B.1.1

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in the LDB Drain Cell within 24 Hours and every 24 Hours thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the LDB Drain Cell.

The 24-Hour initial and recurring Completion Times are based on engineering judgment and are considered sufficient to trend hydrogen concentration. Temporary hydrogen transients in excess of 15% of the LFL are not sufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

B.1.2

Purging the vapor space of the LDB Drain Cell within 24 Hours and every 24 Hours thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the LDB Drain Cell. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of the LDB Drain Cell (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning purge durations for transfer facilities can be found in the ERD (Ref. 6).

The 24-Hour initial and recurring Completion Times are based on engineering judgment and are considered sufficient to prevent a significant accumulation of hydrogen.

B.2

Placing the transfer lines associated with the LDB Drain Cell in OPERATION MODE within 30 Days limits the period of time during which the PROCESS AREAS remain in a MODE that does not restrict HIGH-REM WASTE TRANSFERS.

The Completion Time of 30 Days is considered sufficient to complete any HIGH-REM WASTE TRANSFER that was in progress when this LCO was entered.

(continued)

SURVEILLANCE REQUIREMENTS

4.7.11.1 Verifying that the LDB Drain Cell waste level is less than or equal to the required level stated in Table 3.7.11-1 every 30 Days ensures that the FACILITY is being operated within the assumptions of the safety analysis.

The surveillance frequency of 30 Days is based on the lengthy time to reach an equilibrium hydrogen concentration in the LDB Drain Cell.

Failure to meet of perform this SR requires assuming that the LDB Drain Cell is outside of its limits and entering Condition A of this LCO.

Administrative Control 5.8.2.7 is applicable to any instrument used to perform this SR.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Residual Waste Volumes in Transfer Facilities (U). S-CLC-G-00272, Westinghouse Savannah River Company, Aiken, SC.

3. G. Arthur, M. Pelicone, Process Area Residual Levels for the 10CFR 830 DSA. HLW-STE-2002-00183, Rev. 4, Westinghouse Savannah River Company, Aiken, SC, August 2004.

4. Instrumentation Uncertainties Evaluation Conductivity Probe Installation, Procedure SW11.6-SVP-21, Section 4.1 or SW11.6-SR-3.7.1, Section 4.1. J-CLC-H-00765, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation HTF Conductivity Probes Installation, Procedure SW11.6-SVP-21, Section 4.4. J-CLC-H-00767, Westinghouse Savannah River Company, Aiken, SC.

6. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.12 242-16H and 242-16F Evaporator Cell Sump Level

BASES

BACKGROUND SUMMARY	The Waste Transfer System is designed to prevent above-ground release of the waste being transferred. Many system components are designed to direct any leakage to either a waste storage tank or to a LEAK DETECTION LOCATION. These locations include pump pit sumps, diversion box sumps, valve boxes, drain valve boxes, the HPFP, LDBs, MLDBs, LPSs, tank risers, cell sumps, and tank annuli. To support certain activities, transfer line jumpers are sometimes installed in the 242-16H or 242-16F Evaporator Cells to support direct transfers that bypass the evaporator pot. For waste transfer system jumpers in the evaporator cell and their associated nozzles, the LEAK DETECTION LOCATION is the evaporator cell sump. Any radioactive aqueous caustic wastes leaked to the evaporator cell will continuously produce hydrogen due to the radiolysis of the contained water. The evaporator cells are equipped with non-credited installed forced ventilation systems that purge the location to remove accumulated and evolving hydrogen gas.
APPLICATION TO SAFETY ANALYSIS	An assumption of the accident analysis is that at the start of certain events, the amount of waste already outside of primary containment in LEAK DETECTION LOCATIONS is a small fraction of the total volume of the structure. A limited waste inventory in evaporator cell sumps prior to an event is assumed in the following accident in the safety analysis: Evaporator Cell Explosion (Ref. 1).

(continued)

LCO

This LCO requires that the waste level in evaporator cells be less than or equal to the values stated in Table 3.7.12-1.

The amount of waste in evaporator cells is limited to 1.29% of the available volume of the structure. This is based on maintaining the hydrogen concentration in those locations less than or equal to 25% of the LFL, assuming that the waste present in the location has the maximum hydrogen generation rate used in the accident analysis, and considering the effects of atmospheric breathing (Ref. 2, 3). Since bounding sludge-slurry waste transfers are not permitted through the 242-16F or 242-16H Evaporator Cells, the residual waste volume protected by monitoring the cell sump is judged sufficiently bounding to account for any additional hydrogen contribution from immobile waste deposits in the cell (Ref. 1).

No specific method of measuring waste volumes is required by this LCO. Because these locations are normally monitored by conductivity probes, the table of this LCO provides information concerning the maximum conductivity probe height, including the effects of instrument uncertainty, that ensure that a conductivity probe would alarm upon increasing sump level no later than the time at which that location reached the allowed value in the analysis (Ref. 4). For evaporator cells not currently configured with a conductivity probe (or specific uncertainty analysis is not documented within this LCO), the instrumentation and resulting uncertainties shall be within the assumptions of the applicable uncertainty analysis referenced herein.

If a method of measurement is used other than conductivity probes (e.g., dip tubes, visual/camera confirmation using available landmarks), then an uncertainty allowance associated with that method will be subtracted from the allowed value of the analysis when determining the acceptable observed value associated with using that method.

The LCO is modified by a Note allowing evaporator cell sump level to be intentionally increased above its normal limit under administrative controls. The time that the elevated cell sump level may be maintained is restricted to 7 days. The restriction of adding no more than an additional 300 gallons of waste to the cell/sump during this period ensures that the total volume of undiluted waste in the sump/cell does not exceed 964 gallons (664 gallons normally protected by this LCO plus an additional 300 gallons under the administrative restrictions of this Note).

(continued)

LCO (continued)

The limitations of the Note are sufficient to ensure that the evaporator cell will not reach flammable conditions within 10 days following a leak/spill from the transfer jumper into the evaporator cell (Ref. 1).

This Note allows several types of activities that will increase the evaporator cell sump level to be performed without entry into the Required Actions of the LCO (since the LCO statement, as modified by the Note, will be met). One activity allowed is the flushing of the evaporator vent line for the 242-16H evaporator (e.g., during a simultaneous vent line and GDL flush to initiate a controlled evacuation from the evaporator pot). This activity will result in an expected increase in the evaporator cell sump level due to the connection between the separator pot vent line and the sump jet discharge line. Although most waste/contamination flushed from the vent line and GDL will enter the evaporator pot, some fraction of it may be pushed back through the sump jet and end up in the evaporator cell sump.

A second activity allowed by this Note is cleaning/decontamination activities in the evaporator cell. Periodically, salt deposits have been observed on components within the evaporator cell and on the evaporator cell floors. The Note allows activities that would introduce water into the evaporator cell to remove these deposits without requiring unnecessary entry into the Required Actions of the LCO.

Other activities that are administratively controlled and are within the limitations stated in the Note (e.g., duration, waste volume added, liquid volume added) are also allowed.

If the restrictions on the administrative controls stated in the Note are exceeded (duration exceeds 7 days, waste/liquid volume exceeds stated limits), the Required Actions for the applicable Condition shall be entered at the time exceeding the administrative control is discovered and the Completion Times will also be calculated from that time.

(continued)

MODE APPLICABILITY	This LCO is applicable any time that leakage of waste from transfer lines (jumpers and associated nozzles) in the 242-16H or 242-16F Evaporator Cell configured for liquid transfers through the cell that bypass the evaporator pot could accumulate in the cell sump. Waste transferred through the evaporator cell (via transfer line jumpers and associated nozzles configured for liquid transfers that bypass the evaporator pot) is limited to the inhalation dose potential of bounding supernate. Since the inhalation dose potential of bounding supernate is less than the maximum allowed value for LOW-REM WASTE TRANSFERS (i.e., 2.0E+8 rem/gallon), HIGH-REM WASTE TRANSFERS through the evaporator cell will be effectively prohibited and there will be no allowed activity which would require placing the transfer line (jumper) in the evaporator cell in HIGH-REM TRANSFER MODE. Therefore, this LCO is applicable in OPERATION MODE.
PROCESS AREA APPLICABILITY	This LCO applies to transfer lines (jumpers and associated nozzles) in the 242-16H or 242-16F Evaporator Cell configured for liquid transfers through the cell that bypass the evaporator pot. The term “configured for liquid transfers” is not limited to tanks which contain waste (e.g., waste storage tanks, pump tanks), but also includes any source that could initiate a WASTE TRANSFER, since the concern is with any PROCESS AREA that could initiate a leak of waste into the cell with the evaporator not in operation. A transfer line need not be considered “configured for liquid transfers” if the transfer motive force (e.g., transfer pump) is not connected to a power source and no siphon potential exists. Evaporator system transfer lines and jumpers (e.g., feed jumper, lift jumper) and the evaporator cell sump transfer lines/jumpers are excluded from the PROCESS AREA Applicability of this LCO. These lines are not applicable since transfers through these lines would occur during evaporator operation.

(continued)

ACTIONS

A.1

Stopping liquid transfers through the affected evaporator cell that bypass the evaporator pot within 2 Hours minimizes the amount of additional waste likely to leak into that location from the transfer system jumper.

The Completion Time of 2 Hours allows these transfers to continue for a limited period of time following detection of a high level of liquid in the evaporator cell sump. This 2-Hour period is intended to allow sufficient time to reduce sump level to within limits. If the high level condition can be corrected within 2 Hours, subsequent completion of the Required Actions is not necessary (LCO 3.0.2).

A.2

Ensuring that the waste level in the affected evaporator cell sump is less than or equal to the stated value within 48 Hours is intended to limit the time during which the waste levels exceed those assumed in the analysis.

The risk of higher than normal waste levels in the affected evaporator cell sump is acceptably small since actions were taken to limit the amount of additional waste that could accumulate.

If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition A remains applicable).

B.1

Ensuring hydrogen concentration is less than or equal to 15% of the LFL in the affected evaporator cell within 7 Days and every 7 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the evaporator cell.

The 7-Day initial and recurring Completion Times are based on engineering judgment and are considered sufficient to trend hydrogen concentration. Temporary hydrogen transients in excess of 15% of the LFL are not sufficient to consider this Required Action not met, provided that hydrogen can be reduced below the limit of this Required Action prior to the expiration of the Completion Time.

(continued)

ACTIONS (continued)

B.2

Purging the vapor space of the affected evaporator cell within 7 Days and every 7 Days thereafter ensures that hydrogen is not allowed to accumulate to significant quantities in the vapor space of the evaporator cell. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of the evaporator cell (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning purge durations for transfer facilities can be found in the ERD (Ref. 5).

The 7-Day initial and recurring Completion Times are based on engineering judgment and are considered sufficient to prevent a significant accumulation of hydrogen.

SURVEILLANCE REQUIREMENTS

4.7.12.1 Verifying that the evaporator cell sump waste level is less than or equal to the required level stated in Table 3.7.12-1 every 30 Days ensures that the FACILITY is being operated within the assumptions of the safety analysis.

The surveillance frequency of 30 Days is based on the lengthy time to reach an equilibrium hydrogen concentration in an evaporator cell.

Failure to meet or perform this SR requires assuming that the affected evaporator cell is outside of its limits and entering Condition A of this LCO.

Administrative Control 5.8.2.7 is applicable to any instrument used to perform this SR.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Residual Waste Volumes in Transfer Facilities (U). S-CLC-G-00272, Westinghouse Savannah River Company, Aiken SC.

3. G. Arthur, M. Pelicone, Process Area Residual Levels for the 10CFR 830 DSA. HLW-STE-2002-00183, Rev. 4, Westinghouse Savannah River Company, Aiken, SC, August 2004.

4. Instrumentation Uncertainties Evaluation 2H Evaporator Cell Sump Level Conductivity Probe Loop: HM-242-016-WEE-LE-2011. J-CLC-H-00751, Westinghouse Savannah River Company, Aiken, SC.

5. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.7 TRANSFER SYSTEMS

B3.7.13 242-16F and 242-16H Evaporator Feed Pump Backflow Prevention Devices

BASES

BACKGROUND SUMMARY	Flush water is used to prime the 242-16F and 242-16H Evaporator Feed Pumps during startup to preclude pump cavitation. Once Feed Pump operation is established, the Evaporator Feed System could have a higher pressure than the Flush Water System. The Flush Water Systems to 242-16F and 242-16H Evaporator Feed Pumps each have two backflow prevention devices installed in series to minimize the potential for waste flow going back into the Flush Water System. Once the Feed Pump is primed and operating, flush water is isolated from the pump suction.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits the backflow prevention devices in the Flush Water Systems to 242-16F and 242-16H Evaporator Feed Pumps to provide containment of liquid waste to mitigate an above-ground radioactive material release via the Flush Water System (Ref. 1). The backflow prevention devices are credited in the following accidents in the safety analysis: Transfer Error/SMP Waste Release and Seismic Event (Ref. 1).
LCO	This LCO requires that two backflow prevention devices stated in Table 3.7.13-1 be OPERABLE for the 242-16F and 242-16H Evaporators. For a backflow prevention device to be considered OPERABLE, the device must be capable of minimizing reverse flow and have a leak rate of less than or equal to 1 gpm. The 1 gpm leak rate is based on protecting consequences derived in the safety analysis (Ref. 1).
MODE APPLICABILITY	This LCO is applicable any time that waste from transfer lines in the 242-16F or 242-16H Evaporators could flow back to the Flush Water System through the Feed Pump priming suction path.

(continued)

MODE APPLICABILITY (continued)

Waste transferred through the evaporators has a limited inhalation dose potential (i.e., less than 2.0E+8 rem/gallon). Since the inhalation dose potential of the waste is less than the maximum allowed value for LOW-REM WASTE TRANSFERS, HIGH-REM WASTE TRANSFERS through the evaporator are effectively prohibited and there will be no allowed activity which would require placing the transfer line in the evaporator cell in HIGH-REM TRANSFER MODE.

Therefore, this LCO is applicable in OPERATION MODE.

PROCESS AREA APPLICABILITY

This LCO applies to PROCESS AREAS that could have waste flow back to the Flush Water System through the 242-16F or 242-16H Evaporator Feed Pump priming suction path. When the Feed Pump is not in operation or the pump is not being primed with flush water, this potential does not exist.

Therefore, this LCO applies to Feed Pump transfer lines in the 242-16F or 242-16H Evaporator during Feed Pump priming or Feed Pump operation. The Feed Pump transfer lines for this LCO are the piping from the Feed Pump suction up to and including the second backflow prevention device.

ACTIONS

A.1

The Note preceding Required Action A.1 states that the Required Action shall not prohibit the normal flush following Evaporator Feed Pump operation. This post-operation flush does not have significant impact on the risk of having reverse flow of waste into the Flush Water System, since the Feed Pump is secured, and has the following advantages:

- Reverses any backflow of waste that may have entered the Flush Water System, and
- Reduces the radiological dose in the vicinity of the Evaporator Feed Pump/Flush Water System interface.

Stopping Evaporator Feed Pump operation associated with the affected evaporator IMMEDIATELY minimizes the amount of waste that could potentially leak into the Flush Water System.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

SURVEILLANCE REQUIREMENTS

4.7.13.1 The backflow prevention devices shall be verified to have a leak rate of less than or equal to 1 gpm every 2 Years. Performance of this SR ensures that the devices are capable of mitigating a backflow condition into the Flush Water System. Each backflow prevention device must have a leak rate of less than or equal to 1 gpm at a minimum test pressure of 130 psig (Evaporator Feed System design pressure). This SR may be performed through a bench test or by an in-place test on the backflow prevention devices.

The surveillance frequency of 2 Years is based on check valve failure rates derived in Reference 2.

Failure to meet or perform this SR requires declaring the affected backflow prevention device inoperable and entering Condition A of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Savannah River Site Generic Data Base Development (U). WSRC-TR-93-262, Westinghouse Savannah River Company, Aiken, SC, June 1993.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.1 Waste Tank Purge Ventilation System

BASES

BACKGROUND SUMMARY	The radioactive aqueous caustic wastes received and stored in waste storage tanks continuously produce hydrogen due to the radiolysis of the contained water. Additionally during waste tank chemical cleaning, radioactive aqueous acidic wastes may produce hydrogen due to the corrosion of carbon steel components. Spontaneous liberation may also occur and release hydrogen in the waste tank. Wastes may also contain trace amounts of organic compounds and ammonia. In addition, Tank 50 potentially contains the organic Isopar® L. The waste storage tanks are equipped with installed forced ventilation systems that purge the tank bulk vapor space to remove accumulated and evolving flammable vapors. If the waste tank bulk vapor space forced ventilation system function for a waste storage tank is lost or unavailable for any reason, the flammable vapors being generated by the waste stored within the tank can start to accumulate in the tank bulk vapor space. If allowed to accumulate unchecked, the waste tank bulk vapor space may reach flammable conditions and deflagrate. Proper ventilation system operation prevents or minimizes buildup of flammable vapors in the tank bulk vapor space by providing a forced purge flow. The Waste Tank Ventilation System includes an exhaust fan that draws suction from the tank bulk vapor space, pulls the flow through a HEPA filter, and exhausts the gases out of a stack. The other details of the Waste Tank Ventilation System vary between tank types, but typically the design includes a demister, condenser (except for Type IVs), and reheater.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits forced ventilation on static waste storage tanks (excluding VERY SLOW GENERATION TANKS) with providing sufficient purge flow rate through the tank to maintain the tank's bulk vapor space below flammable conditions (excluding Tank 50). For Tank 50, forced ventilation is credited with maintaining the hydrogen concentration within assumed initial conditions. In waste tanks undergoing sludge agitation, BULK SALT DISSOLUTION, interstitial liquid removal, or free supernate removal operations, forced ventilation is credited with minimizing buildup of flammable vapors in the tank's bulk vapor space and/or maintaining the minimum required time to LFL for the waste tank (Ref. 1).

(continued)

APPLICATION TO SAFETY ANALYSIS (continued)

For waste tanks in which waste tank mixing devices, transfer jets, or crawler lancing devices (from pressure sources greater than 10,000 psi) are operated, forced ventilation is also credited with preventing unfiltered releases (Ref. 1).

An actual purge flow rate of 72 scfm (188 scfm for Tanks 40 and 51) through a RAPID GENERATION TANK or 45 scfm through a SLOW GENERATION TANK provides the following flammability safety functions (Ref. 1):

- Maintains the hydrogen concentration in the waste tank bulk vapor space less than or equal to the safety analysis value (excluding Tank 50) on static waste tanks.
- Maintains Tank 50 hydrogen concentration in the waste tank's bulk vapor space less than or equal to 3.8% of the CLFL.
- Minimizes buildup of flammable vapors in the waste tank's bulk vapor space on waste tanks undergoing sludge agitation, BULK SALT DISSOLUTION, or interstitial liquid removal operations permitted in OPERATION MODE.
- Maintains the minimum required time to LFL (excluding Tank 50), based on applicable tank flammability classification, on waste tanks undergoing free supernate removal.

The minimum flow rate values (45, 72, and 188 scfm) are derived using bounding conditions with respect to tank level, radiolytic hydrogen generation rate, and dissolved hydrogen from a transfer error. The Tank 40 and Tank 51 minimum ventilation flow rate protects the flow requirement determined under the most bounding conditions (i.e., when classified as an ESP SLUDGE SLURRY WASTE TANK). The RAPID GENERATION TANK flow value (72 scfm) would be sufficient when Tank 40 and 51 are not classified as an ESP SLUDGE SLURRY WASTE TANK, but the TSRs have been structured to provide only a single flow value (188 scfm) (Ref. 20 and 22). The 188 scfm flow rate (for Tanks 40 and 51) and the 72/45 scfm flow rates (for Tank 50) do not account for hydrogen released during jetted transfers since steam jetted transfers into ESP SLUDGE SLURRY WASTE TANKS or Tank 50 are not permitted.

Waste Tank Ventilation Systems are credited in the following accidents in the safety analysis: Aerosolization Events and Waste Tank Explosion (Ref. 1).

(continued)

LCO	This LCO requires that the Waste Tank Ventilation System be OPERABLE. To be OPERABLE, all Waste Tank Ventilation Systems require an operating fan generating the required purge flow through the system, an intact flow path (e.g., ductwork, filter housing, reheater shell) from the waste tank to the fan, and an online exhaust filter capable of removing radioactive particulate from the exhaust stream. This LCO also requires that RAPID GENERATION TANKS have an OPERABLE exhaust flow indicator and that the exhaust flow rate be greater than or equal to a minimum value. The minimum required value for exhaust flow is based on the safety analysis value of either 72 or 188 scfm, adjusted for total instrument uncertainty (Ref. 3-16, 19-26). The wide variation in the LCO values is primarily due to the different types of flow elements installed in the Waste Tank Ventilation Systems. A higher exhaust flow rate allowance is permitted to allow Waste Tank Ventilation Systems to remain OPERABLE for a limited period to compensate for reduced performance due to degraded ventilation system integrity. The degraded system integrity may be the result of missing test plugs from the ductwork, broken instrument line, or other "non-system hole" in the ductwork. For waste tanks not currently configured with the required components (or specific uncertainty analysis is not documented within this LCO), the instrumentation shall use the same basic type of instrument serving the same function as those analyzed in uncertainty analyses referenced herein (e.g., pitot tube, orifice, differential pressure gauge, differential pressure transmitter), and the resulting uncertainties shall yield the setpoints provided in this LCO within the same surveillance frequencies.
MODE APPLICABILITY	This LCO is applicable to RAPID and SLOW GENERATION TANKS when they are in OPERATION and CHEMICAL CLEANING MODES. When a RAPID or SLOW GENERATION TANK is in GAS RELEASE MODE (excluding Tank 50), the ventilation requirements of LCO 3.8.9 are applicable.

(continued)

MODE APPLICABILITY (continued)	This LCO is also applicable to VERY SLOW GENERATION TANKS when they are in the following MODES/conditions: • OPERATION and CHEMICAL CLEANING MODES when waste tank mixing devices are operating. • OPERATION and CHEMICAL CLEANING MODES when steam/air is supplied to the tank's transfer jet. • MECHANICAL CLEANING MODE when crawler lancing devices from pressure sources greater than 10,000 psi are operating. VERY SLOW GENERATION TANKS do not produce hydrogen at a rate which requires forced ventilation to prevent explosions, therefore forced ventilation is only required when waste tank mixing devices are operating, steam/air is supplied to the tank's transfer jet, or crawler lancing devices from pressure sources greater than 10,000 psi are operating. The potential to aerosolize waste into the tank bulk vapor space may occur during these conditions.
PROCESS AREA APPLICABILITY	This LCO is applicable to RAPID GENERATION TANKS, SLOW GENERATION TANKS, and VERY SLOW GENERATION TANKS. The status of each individual waste storage tank as either a RAPID GENERATION TANK, SLOW GENERATION TANK, or VERY SLOW GENERATION TANK is identified in the ERD (Ref. 2).
ACTIONS	The Note preceding Condition A clarifies how the Completion Time requirements of Section 1.4 apply to this LCO. If a condition that does not meet this LCO exists at the time GAS RELEASE MODE is exited and OPERATION MODE is entered, the Completion Times for the Required Actions of Condition A shall be determined from the time the condition was initially discovered, not from the time that the MODE change made this LCO applicable. The first Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable to changes in tank flammability classification. This Note allows a flammability classification change to a more restrictive status (e.g., SLOW GENERATION TANK becomes a RAPID GENERATION TANK), even if the ventilation system equipment / exhaust flow does not meet the requirements of this LCO. In this case, the appropriate LCO Condition shall be entered for the new flammability classification.

(continued)

ACTIONS (continued)

A.1

The second Note preceding Required Action A.1 states that for ventilation systems that contain two 100% capacity HEPA banks, completion of Required Actions A.1 and A.2 are not required if entry into this condition is due solely to SR testing required to declare a HEPA filter OPERABLE. This Note allows HEPA testing to establish the in-place performance test efficiency required by the SR. In practical terms, an installed HEPA of unknown efficiency provides some measure of protection. The brief period the HEPA filter bank may be declared inoperable during testing does not appreciably elevate the risk of a release event. However, in the unlikely instance where the efficiency test fails, the OPERABLE HEPA filter bank (if available) shall be placed back in service or the Required Actions shall be invoked.

The third Note preceding Required Action A.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action A.1.

Stopping liquid additions, except for CONTINGENCY TRANSFERS, into the affected waste tank IMMEDIATELY ensures that additional hydrogen-generating waste is not added to the tank while the tank ventilation system is in a degraded condition. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume.

The following are not considered transfers into the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS, recirculation to the feed tank from the 242-16F/H evaporator feed pump, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

(continued)

ACTIONS (continued)

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

A.2

Stopping WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the ventilation system is in a degraded condition.

The following are not considered transfers out of the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS and recirculation from the 242-16F/H evaporator feed pump.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

A.3

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that there is no potential for waste to be aerosolized by waste tank mixing devices while the ventilation system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.4

The Note preceding Required Action A.4 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

Isolating the transfer jet in the affected waste tank from its steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. It also prevents the release of dissolved hydrogen into the affected waste tank caused by the heating of the waste by the jet. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.5.1

Ensuring forced ventilation is operating on the affected tank within 4 Days limits the period within which hydrogen can accumulate in the tank bulk vapor space. Forced ventilation can be provided by the installed fan, or by portable equipment attached to either the purge exhaust stack or directly to a tank riser. The flow rate of the forced ventilation shall meet the minimum flow requirement of 72 scfm (188 scfm for Tanks 40 and 51) for RAPID GENERATION TANKS, unless a separate evaluation is completed to determine minimum flow requirements to maintain the hydrogen concentration in the waste tank bulk vapor space less than or equal to 25% of the LFL (3.8% of the CLFL due to hydrogen for Tank 50) for the current tank contents. Verification that the minimum flow requirement is met may be based on the rated capacity of the fan or portable blower and the system alignment and requires neither initial nor subsequent periodic measurement of flow.

After forced ventilation is initiated, it should be operated to the maximum extent possible until compliance with this LCO is restored. Acceptable reasons to secure forced ventilation for limited periods include, but are not limited to, mechanical failures, interruption of electrical power, refueling of engine/generator, and alarm response.

(continued)

ACTIONS (continued)

The initial Completion Time of 4 Days ensures that forced ventilation is provided to the waste storage tank prior to the time at which the tank bulk vapor space could reach flammable conditions. Repeating this Required Action every 24 Hours ensures that a subsequent loss of ventilation is discovered in a timely manner. Since RAPID GENERATION TANKS have at least 7 days to reach LFL (CLFL for Tank 50) following a loss of ventilation, the 4-Day initial Completion Time of this Required Action combined with the 24-Hour frequency of SR 4.8.1.1 ensure that loss of ventilation is detected, and flow restored, well before flammable conditions are reached.

A.5.2

The Note preceding Required Action A.5.2 states that the Required Action is not applicable to Tank 50. Hydrogen monitoring for Tank 50 is not required.

Verifying hydrogen concentration is less than or equal to the LFL limit stated in the ERD in the affected tank within 4 Days ensures that flammable conditions do not exist in the bulk vapor space when forced ventilation is not in service. After the initial performance of this Required Action, hydrogen concentration is monitored every 24 Hours thereafter to ensure the waste tank bulk vapor space hydrogen concentration is not rapidly increasing without operations awareness.

The Completion Time of 4 Days ensures that hydrogen concentration monitoring is established for the waste storage tank well before the time at which the tank bulk vapor space could reach flammable conditions. Since RAPID GENERATION TANKS have at least 7 days to reach LFL following a loss of ventilation, the 4-Day Completion Time of this Required Action ensures that hydrogen concentration is frequently monitored to ensure operations is aware of the tank's flammable condition.

If this Required Action is not met or the Completion Times are not met, Condition F of this LCO is entered also (Condition A remains applicable).

A.6

Restoring the tank ventilation system to OPERABLE status with an exhaust flow greater than or equal to the value stated in the applicable table within 30 Days restores compliance with the LCO statements for the affected tank.

(continued)

ACTIONS (continued)

The 30-Day Completion Time is based on engineering judgment and operating experience and provides sufficient time to perform necessary repairs to the system. The Completion Time limits the period over which the RAPID GENERATION TANK's ventilation system is allowed to be in a degraded condition.

The Note preceding Condition B clarifies how the Completion Time requirements of Section 1.4 apply to this LCO. If a condition that does not meet this LCO exists at the time GAS RELEASE MODE is exited and OPERATION MODE is entered, the Completion Times for the Required Actions of Condition B shall be determined from the time the condition was initially discovered, not from the time that the MODE change made this LCO applicable.

The first Note preceding Required Action B.1 states that LCO 3.0.4 is not applicable to changes in tank flammability classification. This Note allows a flammability classification change to a more restrictive status (e.g., SLOW GENERATION TANK becomes a RAPID GENERATION TANK), even if the ventilation system equipment / exhaust flow does not meet the requirements of this LCO. In this case, the appropriate LCO Condition shall be entered for the new flammability classification.

B.1

The second Note preceding Required Action B.1 states that for ventilation systems that contain two 100% capacity HEPA banks, completion of Required Actions B.1 and B.2 are not required if entry into this condition is due solely to SR testing required to declare a HEPA filter OPERABLE. This note allows HEPA testing to establish the in-place performance test efficiency required by the SR. In practical terms, an installed HEPA of unknown efficiency provides some measure of protection. The brief period the HEPA filter bank may be declared inoperable during testing does not appreciably elevate the risk of a release event. However, in the unlikely instance where the efficiency test fails, the OPERABLE HEPA filter bank (if available) shall be placed back in service or the Required Actions shall be invoked.

The third Note preceding Required Action B.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action B.1.

(continued)

ACTIONS (continued)

Stopping liquid additions, except for CONTINGENCY TRANSFERS, into the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that additional hydrogen-generating waste is not added to the tank while the tank ventilation system is in a degraded condition. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume.

The following are not considered transfers into the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS, recirculation to the feed tank from the 242-16F/H evaporator feed pump, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

(continued)

ACTIONS (continued)

B.2

Stopping WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the ventilation system is in a degraded condition. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste.

The following are not considered transfers out of the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS and recirculation from the 242-16F/H evaporator feed pump.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

B.3

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that there is no potential for waste to be aerosolized by the waste tank mixing devices while the ventilation system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.4

The Note preceding Required Action B.4 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

(continued)

ACTIONS (continued)

Isolating the transfer jet in the affected waste tank from its steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. It also prevents the release of dissolved hydrogen into the affected waste tank caused by the heating of the waste by the jet. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.5

Ensuring forced ventilation is operating on the affected tank within 21 Days limits the period within which hydrogen can accumulate in the tank bulk vapor space. Forced ventilation can be provided by the installed fan, or by portable equipment attached to either the purge exhaust stack or directly to a tank riser. The flow rate of the forced ventilation shall meet the minimum flow requirement of 45 scfm for SLOW GENERATION TANKS, unless a separate evaluation is completed to determine minimum flow requirements to maintain the hydrogen concentration in the waste tank bulk vapor space less than or equal to 25% of the LFL (3.8% of the CLFL due to hydrogen for Tank 50) for the current tank contents. Verification that the minimum flow requirement is met may be based on the rated capacity of the fan or portable blower and the system alignment and requires neither initial nor subsequent periodic measurement of flow.

After forced ventilation is initiated, it should be operated to the maximum extent possible until compliance with this LCO is restored. Acceptable reasons to secure forced ventilation for limited periods include, but are not limited to, mechanical failures, interruption of electrical power, refueling of engine/generator, and alarm response.

(continued)

ACTIONS (continued)

The initial Completion Time of 21 Days ensures that forced ventilation is provided to the waste storage tank prior to the time at which the tank bulk vapor space could reach flammable conditions. Repeating this Required Action every 7 Days ensures that a subsequent loss of ventilation is discovered in a timely manner. Since SLOW GENERATION TANKS have at least 28 days to reach LFL (CLFL for Tank 50) following a loss of ventilation, the 21-Day initial Completion Time of this Required Action combined with the 24-Hour frequency of SR 4.8.1.2 ensure that loss of ventilation is detected, and flow restored, well before flammable conditions are reached.

B.6

Restoring the tank ventilation system to OPERABLE status within 90 Days restores compliance with the LCO statements for the affected tank.

The 90-Day Completion Time is based on engineering judgment and operating experience and provides sufficient time to perform necessary repairs to the system. The Completion Time limits the period over which the SLOW GENERATION TANK's ventilation system is allowed to be in a degraded condition.

C.1

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that there is no potential for waste to be aerosolized by the waste tank mixing devices while the ventilation system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

C.2

The Note preceding Required Action C.2 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

(continued)

ACTIONS (continued)

Isolating the transfer jet in the affected waste tank from its steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Because completion of these Required Actions removes the affected tank from the MODE Applicability of this LCO, no further actions are required.

C.3

Stopping crawler lancing device operations in the affected waste tank IMMEDIATELY ensures that there is no potential for waste to be aerosolized by the crawler lancing devices while the ventilation system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

The Note preceding Condition D states that this Condition is not applicable to ventilation systems that have only one installed exhaust HEPA filter or that require both exhaust HEPA filters (e.g., Tanks 19 and 21). This Condition allows shifting to an OPERABLE standby filter when multiple exhaust HEPA filters are available in the system; therefore, it is not applicable to those systems with only one filter or which require both filters. If the exhaust HEPA filter is declared inoperable on a ventilation system that has only one installed filter or requires both filters, then Condition A, B, or C of this LCO shall be entered.

D.1

Placing an OPERABLE exhaust HEPA filter in service IMMEDIATELY minimizes the time that an unfiltered ventilation exhaust stream condition potentially exists. This Required Action allows shifting to an OPERABLE standby exhaust HEPA filter (and removing the inoperable exhaust HEPA filter from service) when a standby HEPA is available in the system.

(continued)

ACTIONS (continued)

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

If this Required Action is not met and the Completion Time is not met, Condition A, B, or C of this LCO is entered also (Condition D remains applicable).

The Note preceding Condition E clarifies the actions to be taken in the event the cumulative hole size in the Purge Ventilation System ductwork is greater than 0.55 square inches.

The first Note preceding Required Action E.1 states that LCO 3.0.4 is not applicable to changes in tank flammability classification or changes in applicability for VERY SLOW GENERATION TANKS. This Note allows a flammability classification change to a more restrictive status (e.g., SLOW GENERATION TANK becomes a RAPID GENERATION TANK), even if the ventilation system equipment / exhaust flow does not meet the requirements of this LCO. In this case, the appropriate LCO Condition shall be entered for the new flammability classification. This Note also allows a Mode Applicability change to a more restrictive status as stated in Table 3.8.1-1 for VERY SLOW GENERATION TANKS (e.g., VERY SLOW GENERATION TANK may initiate mixing device operations), even if the ventilation system equipment does not meet the requirements of this LCO. In this case, the appropriate LCO Condition shall be entered for the new Mode Applicability status.

E.1.1

The Note preceding Required Action E.1.1 clarifies the applicability of the Required Action is for RAPID GENERATION TANKS.

(continued)

ACTIONS (continued)

Verifying adequate exhaust flow on the affected tank within 12 Hours ensures the affected tank is receiving the minimum flow requirement for a RAPID GENERATION TANK when the ventilation system structural integrity performance is reduced. The exhaust flow values in Tables 3.8.1-4 and 3.8.1-5 are based on a minimum flow requirement of 72 scfm (188 scfm for Tanks 40 and 51), adjusted for total instrument uncertainty, with an additional allowance for flow which is lost due to a potential cumulative hole size in the ventilation system of 0.55 square inches (Ref. 25-27). The additional allowance is dependent on the fan group for each tank and accounts for potential breaches (e.g., missing test plugs, broken instrument lines) within the length of the ductwork not to exceed a cumulative hole size of 0.55 square inches (Ref. 27).

This Condition applies to the Waste Tank Purge Ventilation System components and ductwork originating from the tank to the purge exhaust fan to include the reheater, HEPA filter housing, and the exhaust fan housing. The cumulative area of 0.55 square inches is equal to the area of two test plug ports (equivalent to two test plug hole diameters of 19/32 inches each).

The initial Completion Time of 12 Hours is well within the time to LFL (CLFL for Tank 50) of 7 Days for a RAPID GENERATION TANK. Repeating this Required Action every 12 Hours ensures that the ventilation flow remains above the minimum required flow for a RAPID GENERATION TANK.

If this Required Action is not met or the Completion Time is not met, Condition A of this LCO is entered also (Condition E remains applicable).

E.1.2

The Note preceding Required Action E.1.2 clarifies the applicability of the Required Action is for SLOW GENERATION TANKS and VERY SLOW GENERATION TANKS.

Verifying that the exhaust fan is operating and aligned to the waste tank on SLOW GENERATION TANKS and VERY SLOW GENERATION TANKS every 12 Hours ensures that a total loss of purge flow through these tanks is detected in a timely manner. Verifying that the fan is aligned to the waste tank may be performed based on inspection of damper alignment or observation of system parameters (e.g., exhaust flow).

(continued)

ACTIONS (continued)

This Condition applies to the Waste Tank Purge Ventilation System components and ductwork originating from the tank to the purge exhaust fan to include the reheater, HEPA filter housing, and the exhaust fan housing. The cumulative area of 0.55 square inches is equal to the area of two test plug ports (equivalent to two test plug hole diameters of 19/32 inches each).

The initial Completion Time of 12 Hours is well within the time to LFL (CLFL for Tank 50) of 28 Days for a SLOW GENERATION TANK. Repeating this Required Action every 12 Hours ensures that the ventilation flow remains above minimum required flow for a SLOW GENERATION TANK. The 12-Hour initial and recurring Completion Times are based on engineering judgment.

If this Required Action is not met or the Completion Time is not met, Condition B or C of this LCO (as applicable) is entered also (Condition E remains applicable).

E.2

Restoring the tank ventilation ductwork structural integrity within 90 Days restores compliance with the LCO statements for the affected tank.

F.1

If Required Action A.5.2 is not met or the associated Completion Times are not met, Condition A of LCO 3.8.2 shall also be entered IMMEDIATELY (LCO 3.8.1 remains applicable). This Required Action will ensure that appropriate actions are taken in response to a hydrogen concentration above the LFL limit stated in the ERD.

SURVEILLANCE REQUIREMENTS

4.8.1.1 Verifying exhaust flow on RAPID GENERATION TANKS is greater than or equal to the value stated in Tables 3.8.1-2 and 3.8.1-3 every 24 Hours ensures that sufficient purge flow is provided through these tanks to maintain the flammability safety functions of the ventilation system.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

The frequency of 24 Hours is based on engineering judgment, including consideration that the minimum allowed time to reach LFL (CLFL for Tank 50) in a RAPID GENERATION TANK following loss of ventilation is 7 days.

Failure to meet or perform this SR requires assuming that the affected exhaust flow is outside of its limits and entering Condition A of this LCO.

4.8.1.2 Verifying that the exhaust fan is operating and aligned to the waste tank on SLOW GENERATION TANKS and VERY SLOW GENERATION TANKS every 24 Hours ensures that a total loss of purge flow through these tanks is detected in a timely manner. Verifying that the fan is aligned to the waste tank may be performed based on inspection of damper alignment or observation of system parameters (e.g., exhaust flow).

The frequency of 24 Hours is based on engineering judgment, including consideration that the minimum allowed time to reach LFL (CLFL for Tank 50) in a SLOW GENERATION TANK following loss of ventilation is 28 days. The frequency of 24 Hours is also sufficient to detect a loss of ventilation on a VERY SLOW GENERATION TANK in a timely manner.

Failure to meet or perform this SR requires declaring the affected tank ventilation system inoperable and entering Condition B or C of this LCO.

4.8.1.3 Verifying the exhaust fan has a maximum capacity greater than or equal to 45 scfm on SLOW GENERATION TANKS every 2 Years ensures that the system is capable of developing sufficient purge flow through the tank to maintain the flammability safety functions of the ventilation system. This SR is not applicable to VERY SLOW GENERATION TANKS because the safety analysis did not require a specific minimum tank purge flow in those tanks.

This surveillance shall be accomplished using installed flow instrumentation or M&TE, and shall account for instrument uncertainty. Administrative Control 5.8.2.7 is applicable to any instrument used to perform this SR.

The frequency of 2 Years is based on engineering judgment.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR requires declaring the affected exhaust fan inoperable and entering Condition B of this LCO.

4.8.1.4 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the required exhaust flow indicators on RAPID GENERATION TANKS stated in Tables 3.8.1-2 and 3.8.1-3. Performance of this SR ensures that the instrumentation that senses exhaust flow is maintained in a sufficiently accurate condition.

The frequency of 1 Year is consistent with the uncertainty analysis for these instruments (Ref. 3-16, 19-24).

Failure to meet or perform this SR requires declaring the affected exhaust flow indicator inoperable and entering Condition A of this LCO.

4.8.1.5 An in-place performance test shall be performed every 18 Months on the HEPA filters stated in Tables 3.8.1-2 and 3.8.1-3. The efficiency of the HEPA filter shall be greater than or equal to 99.5%. The ventilation system must be operating normally (i.e., normal system flow) during the performance test of the HEPA filter.

The frequency of 18 Months is based on the guidance provided in References 17 and 18.

Failure to meet or perform this SR requires declaring the affected HEPA filter inoperable and entering Condition A, B, or C of this LCO if no other OPERABLE exhaust HEPA filter is available in the system or entering Condition D of this LCO if another OPERABLE HEPA filter is available in the system.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

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REFERENCES (continued)

3. Instrumentation Uncertainties Evaluation Tank 7 Ventilation Flow Loops: FL-241-123-HV-FE-2127 and FL-241-123-HV-FE-2127A (U). J-CLC-F-00310, Westinghouse Savannah River Company, Aiken, SC.

4. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 19 (U). J-CLC-F-00216, Washington Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 26-28 and 44-47 (U). J-CLC-F-00303, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 33 and 34 (U). J-CLC-F-00304, Westinghouse Savannah River Company, Aiken, SC.

7. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 38, 40 and 43 (U). J-CLC-H-00777, Westinghouse Savannah River Company, Aiken, SC.

8. Instrumentation Uncertainties Evaluation HV Purge Exhaust Flow Tanks 42, 50, and 51. J-CLC-H-00778, Westinghouse Savannah River Company, Aiken, SC.

9. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 29 and 31 (U). J-CLC-H-00779, Westinghouse Savannah River Company, Aiken, SC.

10. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 49 (U). J-CLC-H-00781, Westinghouse Savannah River Company, Aiken, SC.

11. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 35, 36, and 37. J-CLC-H-00791, Westinghouse Savannah River Company, Aiken, SC.

12. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 30 and 32. J-CLC-H-00792, Westinghouse Savannah River Company, Aiken, SC.

13. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 13. J-CLC-H-00797, Westinghouse Savannah River Company, Aiken, SC.

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REFERENCES (continued)

14. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 41. J-CLC-H-00813, Westinghouse Savannah River Company, Aiken, SC.

15. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 3. J-CLC-F-00317, Westinghouse Savannah River Company, Aiken, SC.

16. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 11. J-CLC-H-00827, Westinghouse Savannah River Company, Aiken, SC.

17. Testing of Nuclear Air Treatment Systems. ASME N510-1989, American Society of Mechanical Engineers, New York, December 1989.

18. Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants. Regulatory Guide 1.52, Office of Nuclear Regulatory Research, USNRC.

19. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 39 (U). J-CLC-H-00859, Westinghouse Savannah River Company, Aiken, SC.

20. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 40 and 51. J-CLC-H-00866, Washington Savannah River Company, Aiken, SC.

21. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 42. J-CLC-H-00870, Westinghouse Savannah River Company, Aiken, SC.

22. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 51. J-CLC-H-00871, Westinghouse Savannah River Company, Aiken, SC.

23. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 25. J-CLC-F-00332, Westinghouse Savannah River Company, Aiken, SC.

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REFERENCES (continued)

24. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 28. J-CLC-F-00337, Westinghouse Savannah River Company, Aiken, SC.

25. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Required DP Indication for Specific Flow Values. J-CLC-F-00342, Washington Savannah River Company, Aiken, SC.

26. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Required DP Indication for Specific Flow Values. J-CLC-H-00900, Washington Savannah River Company, Aiken, SC.

27. Purge Exhaust Vent Flow. M-CLC-G-00360, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.2 Hydrogen Monitoring – RAPID GENERATION TANKS

BASES

BACKGROUND SUMMARY

The radioactive aqueous caustic wastes received and stored in waste storage tanks continuously produce hydrogen due to the radiolysis of the contained water. Additionally during waste tank chemical cleaning, radioactive aqueous acidic wastes may produce hydrogen due to the corrosion of carbon steel components. Spontaneous liberation may also occur and release hydrogen in the waste tank. Wastes may also contain trace amounts of organic compounds and ammonia. In addition, Tank 50 potentially contains the organic Isopar® L. The waste storage tanks are equipped with installed forced ventilation systems that purge the tank bulk vapor space to remove accumulated and evolving flammable vapors.

If the waste tank bulk vapor space forced ventilation system function for a waste storage tank is lost or unavailable for any reason, the flammable vapors being generated by the waste stored within the tank can start to accumulate in the tank bulk vapor space. If allowed to accumulate unchecked, the waste tank bulk vapor space may reach flammable conditions and deflagrate.

RAPID GENERATION TANKS (excluding Tank 50) are sampled for hydrogen using portable LFL monitors. These monitors draw a sample of gas directly from the waste tank's bulk vapor space and provide an indication of the hydrogen concentration to the operator.

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits periodic hydrogen monitoring on RAPID GENERATION TANKS (excluding Tank 50) with detecting an increase in hydrogen concentration in a waste tank above the normal operating range. Following detection of a high hydrogen concentration, operators will take actions to stop activities that have the potential of releasing hydrogen to the tank bulk vapor space and to ensure that purge ventilation is provided to the waste tank.

Hydrogen monitoring on waste tanks (excluding Tank 50) is credited in the following accident in the safety analysis: Waste Tank Explosion (Ref. 1).

(continued)

LCO	This LCO requires that the waste tank bulk vapor space hydrogen concentration be less than or equal to the tank-specific LFL limit stated in the ERD (Ref. 2). Because changes in waste tank conditions and planned operations may occur, the LFL limit of an individual waste tank may change. Therefore, instead of stating the LFL limits directly in this LCO, reference is made to the ERD (Ref. 2). The ERD will be programmatically controlled in accordance with Administrative Control 5.8.2.27 and will reflect the LFL limit for each individual waste tank. The LCO value stated in the ERD (Ref. 2) is based on the safety analysis limit, also determined by Administrative Control 5.8.2.27, and protects the minimum required time to LFL for the waste tank. The LFL limit stated in the ERD (Ref. 2) accounts for potential organics and an allowance for instrument accuracies. The margin for instrument accuracy was based on engineering judgment and the use of M&TE to perform the measurements needed to meet this LCO.
MODE APPLICABILITY	This LCO is applicable in OPERATION and CHEMICAL CLEANING MODES. When a RAPID GENERATION TANK is in GAS RELEASE MODE, the hydrogen monitoring requirements of LCO 3.8.10 are applicable.
PROCESS AREA APPLICABILITY	This LCO is applicable to RAPID GENERATION TANKS (excluding Tank 50). The status of each individual waste storage tank as either a RAPID GENERATION TANK, SLOW GENERATION TANK, or VERY SLOW GENERATION TANK is identified in the ERD (Ref. 2). Hydrogen monitoring requirements for SLOW GENERATION TANKS (excluding Tank 50) in OPERATION and CHEMICAL CLEANING MODES are contained in LCO 3.8.3. VERY SLOW GENERATION TANKS do not require routine hydrogen monitoring. Hydrogen monitoring is not required for Tank 50 when Tank 50 is a RAPID GENERATION TANK (Ref. 1).

(continued)

ACTIONS

The Note preceding Condition A clarifies how the Completion Time requirements of Section 1.4 apply to this LCO. If a condition that does not meet this LCO exists at the time GAS RELEASE MODE is exited and OPERATION MODE is entered, the Completion Times for the Required Actions of Condition A shall be determined from the time the condition was initially discovered, not from the time that the MODE change made this LCO applicable.

A.1

The Note preceding Required Action A.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action A.1.

Stopping liquid additions, except for CONTINGENCY TRANSFERS, into the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that additional hydrogen-generating waste is not added to the tank while the hydrogen concentration is greater than its allowed value. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume.

The following are not considered transfers into the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS, recirculation to the feed tank from the 242-16F/H evaporator feed pump, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

(continued)

ACTIONS (continued)

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

A.2

Stopping WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the hydrogen concentration is greater than its allowed value.

The following are not considered transfers out of the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS and recirculation from the 242-16F/H evaporator feed pump.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

A.3

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the hydrogen concentration is greater than its allowed value.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.4

Ensuring forced ventilation is operating on the affected tank within 24 Hours limits the period during which hydrogen can accumulate in the tank bulk vapor space. Forced ventilation can be provided by the installed fan, or by portable equipment attached to either the purge exhaust stack or directly to a tank riser. The flow rate of the forced ventilation shall meet the minimum flow requirement of 72 scfm (188 scfm for Waste Tanks 40 and 51) for RAPID GENERATION TANKS, unless a separate evaluation is completed to determine minimum flow requirements to maintain the hydrogen concentration in the waste tank bulk vapor space less than or equal to 25% of the LFL for the current tank contents.

After forced ventilation is initiated, it should be operated to the maximum extent possible until the hydrogen concentration is reduced to within limits. Acceptable reasons to secure forced ventilation for limited periods include, but are not limited to, mechanical failures, interruption of electrical power, refueling of engine/generator, and alarm response.

The initial Completion Time of 24 Hours is considered acceptable based on the requirement that RAPID GENERATION TANKS be maintained such that they have at least 7 days to reach flammable conditions following loss of ventilation. The 12-Hour frequency of checking forced ventilation operation ensures that a loss of ventilation is detected, and flow restored, before flammable conditions are reached.

A.5

Reducing hydrogen concentration to less than or equal to the LFL limit stated in the ERD in the affected tank within 7 Days ensures that the abnormal condition is not allowed to exist for unacceptably long periods. This 7-Day period is considered acceptable because actions have been completed to stop additional waste from entering the tank and ensure that the available tank bulk vapor space does not significantly decrease.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Deleted

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.8.2.2 Verifying that the waste tank bulk vapor space hydrogen concentration is less than or equal to the LFL limit stated in the ERD every 24 Hours ensures that hydrogen is not accumulating in the waste tank bulk vapor space to the point that the tank bulk vapor space could reach flammable conditions within 7 days in the absence of forced ventilation. The portable LFL monitors used to perform this surveillance are maintained in accordance with the M&TE program.

Portable LFL monitor operation requires performing pre and post instrument use checks to validate proper operations and accuracy of the portable LFL analyzer. The SR may not be considered successfully completed until after the post use check of the instrument is successfully completed. This SR does not automatically fail if the LFL monitor fails the post use check, since the SR can be re-performed using a different instrument.

The surveillance frequency of 24 Hours is based on the minimum time of 7 days for a RAPID GENERATION TANK'S bulk vapor space hydrogen concentration to go from the safety analysis limit (determined by Administrative Control 5.8.2.27) to 100% of the LFL.

Failure to meet or perform this SR requires assuming that the affected tank hydrogen concentration is outside of its limits and entering Condition A of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.3 Hydrogen Monitoring – SLOW GENERATION TANKS

BASES

BACKGROUND SUMMARY

The radioactive aqueous caustic wastes received and stored in waste storage tanks continuously produce hydrogen due to the radiolysis of the contained water. Additionally during waste tank chemical cleaning, radioactive aqueous acidic wastes may produce hydrogen due to the corrosion of carbon steel components. Spontaneous liberation may also occur and release hydrogen in the waste tank. Wastes may also contain trace amounts of organic compounds and ammonia. In addition, Tank 50 potentially contains the organic Isopar® L. The waste storage tanks are equipped with installed forced ventilation systems that purge the tank bulk vapor space to remove accumulated and evolving flammable vapors.

If the waste tank bulk vapor space forced ventilation system function for a waste storage tank is lost or unavailable for any reason, the flammable vapors being generated by the waste stored within the tank can start to accumulate in the tank bulk vapor space. If allowed to accumulate unchecked, the waste tank bulk vapor space may reach flammable conditions and deflagrate.

SLOW GENERATION TANKS (excluding Tank 50) are sampled for hydrogen using portable LFL monitors. These monitors draw a sample of gas directly from the waste tank's bulk vapor space and provide an indication of the hydrogen concentration to the operator.

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits periodic hydrogen monitoring on SLOW GENERATION TANKS (excluding Tank 50) with detecting an increase in hydrogen concentration in a waste tank above the normal operating range. Following detection of a high hydrogen concentration, operators will take actions to stop activities that have the potential of releasing hydrogen to the tank bulk vapor space and to ensure that purge ventilation is provided to the waste tank.

Hydrogen monitoring on waste tanks (excluding Tank 50) is credited in the following accident in the safety analysis: Waste Tank Explosion (Ref. 1).

(continued)

LCO	This LCO requires that the waste tank bulk vapor space hydrogen concentration be less than or equal to the tank-specific LFL limit stated in the ERD (Ref. 2). Because changes in waste tank conditions and planned operations may occur, the LFL limit of an individual waste tank may change. Therefore, instead of stating the LFL limits directly in this LCO, reference is made to the ERD (Ref. 2). The ERD will be programmatically controlled in accordance with Administrative Control 5.8.2.27 and will reflect the LFL limit for each individual waste tank. The LCO value stated in the ERD (Ref. 2) is based on the safety analysis limit, also determined by Administrative Control 5.8.2.27, and protects the minimum required time to LFL for the waste tank. The LFL limit stated in the ERD (Ref. 2) accounts for potential organics and an allowance for instrument accuracies. The margin for instrument accuracy was based on engineering judgment and the use of M&TE to perform the measurements needed to meet this LCO.
MODE APPLICABILITY	This LCO is applicable in OPERATION and CHEMICAL CLEANING MODES. When a SLOW GENERATION TANK is in GAS RELEASE MODE, the hydrogen monitoring requirements of LCO 3.8.10 are applicable.
PROCESS AREA APPLICABILITY	This LCO is applicable to SLOW GENERATION TANKS (excluding Tank 50). The status of each individual waste storage tank as either a RAPID GENERATION TANK, SLOW GENERATION TANK, or VERY SLOW GENERATION TANK is identified in the ERD (Ref. 2). Hydrogen monitoring requirements for RAPID GENERATION TANKS (excluding Tank 50) in OPERATION and CHEMICAL CLEANING MODES are contained in LCO 3.8.2. VERY SLOW GENERATION TANKS do not require routine hydrogen monitoring. Hydrogen monitoring is not required for Tank 50 when Tank 50 is a SLOW GENERATION TANK (Ref. 1).

(continued)

ACTIONS (continued)

The Note preceding Condition A clarifies how the Completion Time requirements of Section 1.4 apply to this LCO. If a condition that does not meet this LCO exists at the time GAS RELEASE MODE is exited and OPERATION MODE is entered, the Completion Times for the Required Actions of Condition A shall be determined from the time the condition was initially discovered, not from the time that the MODE change made this LCO applicable.

A.1

The Note preceding Required Action A.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action A.1.

Stopping liquid additions, except for CONTINGENCY TRANSFERS, into the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that additional hydrogen-generating waste is not added to the tank while the hydrogen concentration is greater than its allowed value. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume.

The following are not considered transfers into the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS, recirculation to the feed tank from the 242-16F/H evaporator feed pump, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

(continued)

ACTIONS (continued)

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

A.2

Stopping WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, out of the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the hydrogen concentration is greater than its allowed value.

The following are not considered transfers out of the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS and recirculation from the 242-16F/H evaporator feed pump.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

A.3

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the hydrogen concentration is greater than its allowed value.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.4

Ensuring forced ventilation is operating on the affected tank within 72 Hours limits the period during which hydrogen can accumulate in the tank bulk vapor space. Forced ventilation can be provided by the installed fan, or by portable equipment attached to either the purge exhaust stack or directly to a tank riser. The flow rate of the forced ventilation shall meet the minimum flow requirement of 45 scfm for SLOW GENERATION TANKS, unless a separate evaluation is completed to determine minimum flow requirements to maintain the hydrogen concentration in the waste tank bulk vapor space less than or equal to 25% of the LFL for the current tank contents.

After forced ventilation is initiated, it should be operated to the maximum extent possible until the hydrogen concentration is reduced to within limits. Acceptable reasons to secure forced ventilation for limited periods include, but are not limited to, mechanical failures, interruption of electrical power, refueling of engine/generator, and alarm response.

The initial Completion Time of 72 Hours is considered acceptable based on the requirement that SLOW GENERATION TANKS be maintained such that they have at least 28 days to reach flammable conditions following loss of ventilation. The 24-Hour frequency of checking forced ventilation operation ensures that a loss of ventilation is detected, and flow restored, before flammable conditions are reached.

A.5

Reducing hydrogen concentration to less than or equal to the LFL limit stated in the ERD in the affected tank within 7 Days ensures that the abnormal condition is not allowed to exist for unacceptably long periods. This 7-Day period is considered acceptable because actions have been completed to stop additional waste from entering the tank and ensure that the available tank bulk vapor space does not significantly decrease.

(continued)

SURVEILLANCE REQUIREMENTS

4.8.3.1 Verifying that the waste tank bulk vapor space hydrogen concentration is less than or equal to the LFL limit stated in the ERD every 7 Days ensures that hydrogen is not accumulating in the waste tank bulk vapor space to the point that the tank bulk vapor space could reach flammable conditions within 28 days in the absence of forced ventilation. The portable LFL monitors used to perform this surveillance are maintained in accordance with the M&TE program.

Portable LFL monitor operation requires performing pre and post instrument use checks to validate proper operations and accuracy of the portable LFL analyzer. The SR may not be considered successfully completed until after the post use check of the instrument is successfully completed. This SR does not automatically fail if the LFL monitor fails the post use check, since the SR can be re-performed using a different instrument.

The surveillance frequency of 7 Days is based on the minimum time of 28 days for a SLOW GENERATION TANK's bulk vapor space hydrogen concentration to go from the safety analysis limit (determined by Administrative Control 5.8.2.27) to 100% of the LFL.

Failure to meet or perform this SR requires assuming that the affected tank hydrogen concentration is outside of its limits and entering Condition A of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.4 Waste Storage Tank Level

BASES

BACKGROUND SUMMARY

All waste storage tanks have a High Liquid Level Conductivity Probe (HLLCP) which alerts operators to tank waste level exceeding the level at which the conductivity probe was set. The HLLCP is a simple device that is actuated when liquid waste (or any relatively conductive medium) comes into contact with the probe and creates an electrical ground path.

The actual level of waste is continuously tracked in most waste storage tanks for process-related reasons using non-credited level indicators called reel tapes. For tanks where a reel tape is not available, portable measuring devices called steel tapes are used periodically.

Because safety-related concerns for tank level can be addressed by ensuring that waste level in the tank does not exceed a maximum value, it is not necessary to credit an instrument capable of actively measuring the current level of waste.

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits a maximum waste storage tank level to prevent certain events or protect initial conditions used in the accident analysis (Ref. 1). A maximum waste storage tank level prior to an event is assumed in the following accidents in the safety analysis: Transfer Error/SMP Waste Release, Waste Tank Explosion, Waste Tank Annulus Explosion, Waste Tank Wall Failure, Waste Tank Siphon/Pump-Out (Tanks 1 and 2 only), Tornado and High Winds Event, Seismic Event, Wildland Fire, and Loss of Offsite Power (Ref. 1).

The maximum allowed level in a specific waste storage tank is a function of the waste characteristics (e.g., specific gravity, hydrogen generation rate) of the current inventory of the tank. Since the waste characteristics are subject to change in active waste tanks, the maximum allowed levels are periodically evaluated and updated in the ERD (Ref. 7).

Waste tank HLLCPs and alarms are credited in the following accidents in the safety analysis: Transfer Error/SMP Waste Release, Waste Tank Explosion, Waste Tank Annulus Explosion, Waste Tank Wall Failure, Waste Tank Siphon/Pump-Out (Tanks 1 and 2 only), Tornado and High Winds Event, Seismic Event, Wildland Fire, and Loss of Offsite Power (Ref. 1).

(continued)

LCO

This LCO requires that liquid level in waste tanks be less than or equal to the tank-specific fill limits stated in the ERD (Ref. 7) and that the HLLCPs and associated control room alarms be OPERABLE.

The fill limit for a waste tank is set at the most restrictive of the following six considerations:

- level at which the tank would physically overflow (typically through a sidewall penetration)
- level at which the tank wall stresses would exceed a maximum allowed value (limiting for only Type I and II tanks, function of waste specific gravity)
- level above which it would be physically possible to siphon waste from the tank through the cooling coils (credited on only Tanks 1 and 2, less restrictive than limit to prevent overflowing through sidewall penetrations)
- level of the lowest known tank wall crack for a single-wall waste tank (limiting for only Tank 19)
- level required to maintain the required time to reach LFL (CLFL for Tank 50) or the equilibrium hydrogen concentration for the waste tank's classification (i.e., RAPID GENERATION TANK, SLOW GENERATION TANK, or VERY SLOW GENERATION TANK)
- level required to protect flammable transient assumptions for waste tank trapped gas releases

Because it is possible for the characteristics of the contents of a waste tank to change over time as transfers are made into and out of the waste tank and other process changes occur, it is expected that the fill limit of an individual tank will change. Additionally during certain waste tank activities (e.g., waste tank acidic spray washing), the fill limit of a waste tank may be more restricted than the normal operations value. Therefore, instead of stating the tank fill limits directly in this LCO, reference is made to the ERD (Ref. 7). This document will be programmatically controlled in accordance with Administrative Control 5.8.2.44 and will reflect the most limiting of the above levels for each individual waste tank. For waste tanks that undergo acidic spray washing, the ERD (Ref. 7) will reflect both the normal operations limit and the acidic spray washing limit. Excluding acidic spray washing fill limits, the fill limit stated in the ERD (Ref. 7) will reflect the total instrument uncertainty associated with the HLLCPs (Ref. 2-6).

(continued)

LCO (continued)

An OPERABLE HLLCP shall be capable of detecting an increase in liquid level above the required SETPOINT of the probe and alarming in the control room to alert operators to the condition.

It is not necessary to consider an alarming HLLCP inoperable, unless it is determined that the alarm has been caused by a failure of the instrument. An alarming HLLCP has performed its function of alerting operators to a high waste tank level condition, and the HLLCP is not required to subsequently perform any other credited function until the waste tank level is subsequently reduced below the SETPOINT of the HLLCP.

MODE APPLICABILITY

This LCO is applicable whenever the waste storage tank is in normal waste-storage service, is undergoing waste removal, or is allowed to receive waste. Because waste storage tanks may be in normal waste-storage service, undergo waste removal, or be allowed to receive waste in all MODES except MECHANICAL CLEANING and REMOVED FROM SERVICE MODES, this LCO is applicable in GAS RELEASE, OPERATION, and CHEMICAL CLEANING MODES.

PROCESS AREA APPLICABILITY

This LCO is applicable to all waste storage tanks except for Tank 48. Waste level and HLLCP OPERABILITY in Tank 48 is addressed by LCO 3.2.7.

ACTIONS

A.1

The Note preceding Required Action A.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action A.1.

Stopping liquid additions, except for CONTINGENCY TRANSFERS, into the affected waste tank IMMEDIATELY ensures that additional hydrogen-generating waste is not added to the tank while the tank level is higher than its allowed value. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume. A higher than allowed tank level could unacceptably shorten the time required to reach LFL (CLFL for Tank 50) in the tank following a loss of ventilation.

(continued)

ACTIONS (continued)

The following are not considered transfers into the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS, recirculation to the feed tank from the 242-16F/H evaporator feed pump, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

A.2

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the tank level is higher than its allowed value. A higher than allowed tank level could unacceptably shorten the time required to reach LFL (CLFL for Tank 50) in the tank following a loss of ventilation.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.3

Verifying that the affected tank has a time to LFL (CLFL for Tank 50) greater than or equal to 7 Days within 24 Hours of entering this Condition ensures that the assumptions of the accident analysis have not been violated. The time to LFL (CLFL for Tank 50) determination shall use actual tank level (if tank level is above the fill limit) and assume the initial LFL (CLFL for Tank 50) is at the hydrogen concentration safety analysis limit value determined by Administrative Control 5.8.2.27.

The Completion Time of 24 Hours is considered adequate because even in the event that the tank fill limit is exceeded by 15,000 gallons, the waste tank bulk vapor space volume will be reduced by only 18% (Type IIIA with 372-inch fill limit), therefore the waste tank is still expected to have several days to reach flammable conditions following a loss of ventilation.

If this Required Action is not met or the Completion Time is not met, Condition D of this LCO is entered also (Condition A remains applicable).

A.4

Determining the flammability classification of the affected tank (e.g., RAPID GENERATION TANK, SLOW GENERATION TANK) within 24 Hours ensures that the associated controls for the flammability classification are established.

The Completion Time of 24 Hours is considered adequate because even in the event that the tank fill limit is exceeded by 15,000 gallons, the waste tank bulk vapor space volume will be reduced by only 18% (Type IIIA with 372-inch fill limit), therefore the waste tank is still expected to have several days to reach flammable conditions following a loss of ventilation.

A.5

Reducing the level in the affected tank to less than or equal to its fill limit within 30 Days restores compliance with this LCO. The Completion Time of 30 Days is based on a reasonable time to perform a transfer out of a waste tank that is normally in an inactive storage state and includes consideration of procedure development, support system configuration, and pre-transfer equipment testing.

(continued)

ACTIONS (continued)

The Completion Time of 30 Days is considered acceptable based on the completion of Required Actions A.1 through A.4 that have provided sufficient compensatory measures during this period.

B.1

The Note preceding Required Action B.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action B.1.

Stopping liquid additions, except for CONTINGENCY TRANSFERS, into the affected waste tank IMMEDIATELY ensures that additional hydrogen-generating waste is not added to the tank while the tank level monitoring system is in a degraded condition. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume.

The following are not considered transfers into the affected tank for compliance with this Required Action: CONTINGENCY TRANSFERS, recirculation to the feed tank from the 242-16F/H evaporator feed pump, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and cannot cause a waste tank overflow event.

(continued)

ACTIONS (continued)

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

B.2

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the tank level monitoring system is in a degraded condition. A higher than allowed tank level could unacceptably shorten the time required to reach LFL (CLFL for Tank 50) in the tank following a loss of ventilation.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.3

The first Note preceding Required Action B.3 states that if affected tank level has been measured within the 2 Hours preceding entry into this Condition, then the requirement of Required Action B.3 (to verify tank level less than or equal to the fill limit within 24 Hours) may be considered met by the previous measurement.

The second Note preceding Required Action B.3 states that non-waste liquid additions (e.g., flush water, inhibited water) to the waste tank are not prevented by Required Action B.1 after Required Action B.3 initial completion is performed.

Verifying that the affected tank liquid level is less than or equal to the applicable fill limit within 24 Hours and every 7 Days thereafter ensures that an increase in waste level above the fill limit will be detected in a timely manner. A periodic check of tank level is considered adequate because actions have been completed to stop transfers into the tank, which are the most likely causes of a significant increase in tank level.

(continued)

ACTIONS (continued)

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition B remains applicable).

B.4

Restoring the HLLCP/alarm to OPERABLE status within 30 Days restores compliance with the LCO statements for the affected tank.

The 30-Day Completion Time is based on engineering judgment and operating experience and provides sufficient time to perform necessary repairs to the system. The Completion Time limits the period over which the waste tank's level instrumentation is allowed to be in a degraded condition.

The Note preceding Condition C states that this Condition must be entered prior to the initiation of acidic spray washing activities in the affected waste tank. During acidic spray washing activities, the HLLCP is inoperable and the Required Actions of this Condition provide appropriate compensatory measures assumed in the safety analysis for this activity (e.g., limited volume additions). This Note also states that this Condition may not be exited until 10 days after completion of acidic spray washing activities (i.e., completion of final acidic spray wash addition). This restriction allows hydrogen concentration in the vapor space to return to the equilibrium value prior to the acidic spray washing activity.

C.1

Stopping liquid additions, except for batch additions from a supply tank(s) of less than or equal to 8,000 gallons total volume that do not have continuous makeup capability, into the affected waste tank IMMEDIATELY ensures that liquid additions made to the affected tank are within the assumptions of the safety analysis while the tank level monitoring system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

C.2

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste during acidic spray washing activities.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

C.3

Verifying that the affected tank liquid level is less than or equal to the acidic spray washing fill limit within 24 Hours and every 7 Days thereafter ensures that an increase in waste level above the fill limit will be detected in a timely manner. A periodic check of tank level is considered adequate because actions have been taken to limit liquid additions to the affected tank.

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition C remains applicable).

C.4

The Note preceding Required Action C.4 states that this Condition may not be exited until 10 days after completion of acidic spray washing activities (i.e., completion of final acidic spray wash addition). This restriction allows hydrogen concentration in the vapor space to return to the equilibrium value prior to the acidic spray washing activity.

Restoring the HLLCP/alarm to OPERABLE status within 30 Days after completion of acidic spray washing activities restores compliance with the LCO statements for the affected tank.

The 30-Day Completion Time is based on engineering judgment and operating experience. The Completion Time limits the period over which the waste tank's level instrumentation is allowed to be in a degraded condition.

D.1

The Note preceding Required Action D.1 states that the Required Action is not applicable to Tank 50. Hydrogen monitoring for Tank 50 is not required.

(continued)

ACTIONS (continued)

If Required Action A.3 or the associated Completion Time is not met, then either the time needed for the tank to reach LFL is less than 7 days, or the time is indeterminate. In this Condition, an increase in the frequency of checks on the tank's flammable vapor concentration and waste tank ventilation status are warranted. Although the more frequent checks will not restore the time to reach flammable conditions to greater than 7 Days, they will provide a means of detecting a loss of ventilation or an increase in hydrogen concentration more rapidly than normal, therefore allowing more time to respond before flammable conditions are reached.

Verifying that the hydrogen concentration is less than or equal to the LFL limit stated in the ERD within 6 Hours and every 6 Hours thereafter ensures that an increase in hydrogen concentration above its limit is detected and responded to in a timely manner. The 6-Hour initial and recurring Completion Times are based on engineering judgment.

D.2

Ensuring that forced ventilation is operating on the affected tank within 6 Hours and every 6 Hours thereafter ensures that a loss of ventilation is detected and responded to in a timely manner. The 6-Hour initial and recurring Completion Times are based on engineering judgment.

D.3

The Note preceding Required Action D.3 states that the Required Action is applicable only for Tank 50.

SR 4.8.14.1 verifies Tank 50 average bulk waste temperature is less than or equal to 39°C. Ensuring the waste temperature is at or below this value limits the trace organics and equilibrium Isopar® L contributions to the flammable vapor concentration in the tank vapor space.

Performance of SR 4.8.14.1 within 12 Hours and every 12 Hours thereafter ensures that an elevated tank waste temperature is detected and responded to in a timely manner. The 12-Hour initial and recurring Completion Times are based on engineering judgment.

(continued)

ACTIONS (continued)

D.4

Restoring the affected tank's time to LFL (CLFL for Tank 50) to greater than or equal to 7 Days allows exiting this Condition. Condition A, B, or C may remain applicable, depending on the status of compliance with the tank fill limit and OPERABILITY of the HLLCP/alarm. The time to LFL (CLFL for Tank 50) determination shall use actual tank level (if tank level is above the fill limit) and assume the initial LFL (CLFL for Tank 50) is at the hydrogen concentration safety analysis limit value determined by Administrative Control 5.8.2.27.

The Completion Time of 30 Days is considered acceptable based on the requirements for increased periodic checks of tank hydrogen concentration, ventilation status, and Tank 50 waste temperature applied through Required Actions D.1 through D.3.

SURVEILLANCE REQUIREMENTS

4.8.4.1 Performance of an INSTRUMENT LOOP TEST on each required HLLCP every 7 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the tank grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 7 Days is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO.

4.8.4.2 Conductivity probes are verified to be set at or below the required level every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation High Liquid Level Conductivity Probes Tank Types I, III, and IIIA. J-CLC-F-00300, Westinghouse Savannah River Company, Aiken, SC.

3. Instrumentation Uncertainties Evaluation High Liquid Level Conductivity Probes Tank Type IV. J-CLC-F-00302, Westinghouse Savannah River Company, Aiken, SC.

4. Instrumentation Uncertainties Evaluation High Liquid Level Conductivity Probes Tank Type I, II, III, and IIIA. J-CLC-H-00775, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation High Liquid Level Conductivity Probes Tank Type IV. J-CLC-H-00776, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation High Liquid Level Conductivity Probes Tank Type IIIA. J-CLC-H-00784, Westinghouse Savannah River Company, Aiken, SC.

7. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.5 Annulus Level / Ventilation

BASES

BACKGROUND SUMMARY

Type I, II, III, and IIIA waste tanks each consist of a primary tank structure built within a secondary containment. The secondary containment consists of a reinforced concrete structure lined with a partial-height (Type I and II tanks) or full-height (Type III and IIIA tanks) steel liner. All of these waste tanks are designed with an annular region surrounding the outer wall of the primary tank. Type III and IIIA tanks also have a much smaller inner annulus in the space between the tank's center column and the inner wall of the primary tank. In many waste tanks, transfer lines pass through the annulus to connect the waste tank with underground portions of the transfer system. Transfer lines passing through the annulus are jacketed.

The radioactive aqueous caustic wastes received and stored in waste storage tanks continuously produce hydrogen due to the radiolysis of the contained water. Additionally, radioactive aqueous acidic wastes contained in waste storage tanks during chemical cleaning may produce hydrogen due to the corrosion of carbon steel components. In the event that waste leaks into the annulus through the tank wall or from a transfer line, the waste that collects in the annulus will also continuously produce hydrogen.

Several Type I tanks and all Type II tanks have leaked waste into the annulus. The amount of dried residue currently remaining in the annulus from this leaked waste ranges from barely detectable quantities to thousands of gallons. There has never been leakage from a Type III or IIIA tank wall.

The Annulus Ventilation System for Type I and II tanks operates the annulus at positive pressure. The system includes a fan that provides air flow through a pre-heater. The heated air is directed to a cylindrical duct that is mounted on the floor of the annulus and which distributes air flow around the circumference of the primary tank. The annulus exhaust duct directs air leaving the annulus through a filter.

(continued)

BACKGROUND SUMMARY (continued)	The Annulus Ventilation System for Type III and IIIA tanks operates the annulus at negative pressure. The system includes a supply duct that directs air flow through a pre-heater. The supply duct is then split, directing heated air to both the inner annulus and outer annulus. The exhaust fan takes suction on the top of the outer annulus and directs flow up a stack. The air flow initially directed to the inner annulus flows in cooling slots under the floor of the primary tank into the outer annulus.
APPLICATION TO SAFETY ANALYSIS	An assumption of the accident analysis is that at the start of certain events, the amount of waste already in the annulus is a small fraction of the total annulus volume and the hydrogen concentration in the annulus is less than or equal to 25% of the LFL (Ref. 1). For Type III and IIIA tanks (excluding Tank 40 and 50), the amount of waste allowed in the annulus by the accident analysis is 5.5 inches and 5.8 inches, respectively. The waste is assumed to have a bounding hydrogen generation rate of 1.5E-5 ft3/hour-gallon. For Tank 40, the amount of waste allowed in the annulus by the accident analysis is 2.0 inches, assuming the bounding hydrogen generation rate of ESP SLUDGE SLURRY (5.0E-5 ft3/hour-gallon). These waste levels would result in an equilibrium hydrogen concentration of 25% of the LFL assuming only the effects of atmospheric breathing in the annulus (Ref. 2). For Tank 50, no maximum initial waste volume was assumed in the accident analysis, and thus annulus volume does not require protection. For Type I and II tanks, the amount of waste allowed in the annulus by the accident analysis is 21 inches and 23 inches, respectively, except during chemical cleaning operations in Type I waste tanks. The waste is assumed to have a hydrogen generation rate less than or equal to 5.6E-6 ft3/hour-gallon. This amount of waste would result in a maximum hydrogen concentration of 25% of the LFL, provided that the annulus is sufficiently purged with active ventilation every 108 days. If the annulus ventilation is not operated, equilibrium hydrogen concentration in the annulus, assuming only the effects of atmospheric breathing, would be 50% of the LFL (Ref. 3). For Type I tanks during chemical cleaning, the amount of waste allowed in the annulus by the accident analysis is 12 inches. The waste is assumed to have a surface hydrogen generation rate less than or equal to 6.2E-6 ft3/ft2-min. This amount of waste would result in a maximum hydrogen concentration of 25% of the LFL, provided that the annulus is sufficiently purged with active ventilation every 104 hours (Ref. 4).

(continued)

APPLICATION TO SAFETY ANALYSIS (continued)	A limited waste inventory in a waste tank annulus, and corresponding low hydrogen concentration, is credited in the following accidents in the safety analysis: Transfer Error/SMP Waste Release and Waste Tank Annulus Explosion (Ref. 1).
LCO	This LCO requires that the waste level in an annulus be less than or equal to the values stated in Table 3.8.5-1, 3.8.5-2, or 3.8.5-3 and that forced ventilation be operated on Type I and II tank annuli at a frequency and duration sufficient to maintain the flammable vapor concentration of the annulus vapor space less than or equal to 25% of the LFL. This LCO also requires that one leak detection instrument stated in Tables 3.8.5-1, 3.8.5-2, and 3.8.5-3 be OPERABLE in a waste tank annulus when used to monitor annulus level for Surveillance Requirements. An OPERABLE leak detection instrument shall be capable of detecting an increase in liquid level above the required SETPOINT of the probe and alarming in the control room to alert operators to the condition. The SETPOINTS for the annulus conductivity probes stated in Tables 3.8.5-1, 3.8.5-2, and 3.8.5-3 reflect the actual analysis values. The effects of any instrument uncertainty will be accounted for during probe installation. Inner annulus conductivity probes for Type IIIA tanks are excluded from the tables of this LCO because they are not capable of detecting waste accumulating in the outer annulus to a height of 5.8 inches. It is not necessary to consider an alarming leak detection instrument inoperable, unless it is determined that the alarm has been caused by a failure of the instrument. An alarming conductivity probe has performed its function of alerting operators to a high level condition, and the conductivity probe is not required to subsequently perform any other credited function until waste is subsequently reduced below the SETPOINT of the conductivity probe.

(continued)

LCO (continued)

Although this LCO requires one OPERABLE leak detection instrument, the waste tank annuli have multiple conductivity probes. Thus when a conductivity probe is in alarm, an investigation to determine if the annulus level is above the allowed value is permitted prior to required entry into Condition A (for high annulus waste level) provided that three annulus conductivity probes are OPERABLE and only one conductivity probe is in an alarm condition. If less than three annulus conductivity probes are OPERABLE or if the annulus conductivity probes are ganged to one alarm, then entry into Condition A is required upon receipt of an annulus conductivity probe alarm.

MODE APPLICABILITY

This LCO is applicable any time a waste storage tank contains waste that could leak a sufficient amount into the annulus to pose a flammability concern in the annulus, and during transfer of waste through lines that pass through the annulus. Waste storage tanks can contain waste quantities of concern in any MODE except MECHANICAL CLEANING and REMOVED FROM SERVICE MODES. Transfer of waste through lines that pass through the annulus can occur in any MODE except MECHANICAL CLEANING and REMOVED FROM SERVICE MODES.

Therefore this LCO is applicable in GAS RELEASE, OPERATION, and CHEMICAL CLEANING MODES.

PROCESS AREA APPLICABILITY

This LCO is applicable to all waste storage tanks that have an annulus, excluding Tank 48 and Tank 50. Therefore this LCO applies to all Type I, II, III, and IIIA tanks, excluding Tank 48 and Tank 50.

Tank 48 contains waste that has the potential of producing significant quantities of benzene. Therefore the analysis and controls for waste tank explosions and annulus explosions are different for Tank 48.

For Tank 50, no maximum initial waste volume was assumed in the accident analysis and the safety analysis does not require protection of the Tank 50 annulus volume (Ref. 1).

(continued)

ACTIONS

A.1

Stopping WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, through the affected waste tank annulus IMMEDIATELY minimizes the amount of additional hydrogen-generating waste likely to leak into the annulus from the transfer line. It also ensures that in the case of a jet transfer through the tank annulus, additional dissolved hydrogen is not released into the annulus vapor space due to the effect of the jet heating the transferred waste.

The following are not considered transfers through the affected tank annulus for compliance with this Required Action: CONTINGENCY TRANSFERS, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS have minimal impact on additional hydrogen release from the waste in the annulus.

A.2

Purging the vapor space of the affected annulus within 7 Days and every 7 Days thereafter ensures that hydrogen is not allowed to accumulate to flammable quantities in the vapor space of the annulus. The purge rate and duration shall be sufficient to provide a minimum of 12 turnovers of the vapor space of the annulus (Ref. 1). If the current vapor space of the location cannot be accurately determined, the required purge amount should be based on the entire volume of the structure. Information concerning purge durations for tank annuli can be found in the ERD (Ref. 5).

The 7-Day initial and recurring Completion Times are sufficient to prevent flammable conditions from developing in the annulus.

(continued)

ACTIONS (continued)

A.3

The Note preceding Required Action A.3 states that a negative pressure filtered ventilation system must be used, when the annulus transfer jet is being used, in order to support controls required for aerosolization events. This precludes the use of the installed positive pressure annulus ventilation systems for Type I and II tanks.

Ensuring that the waste level in the affected annulus is less than or equal to the value stated in Table 3.8.5-1, 3.8.5-2, or 3.8.5-3 within 90 Days restores annulus waste level (and equilibrium annulus hydrogen concentration) to within the limits of the accident analysis.

The Completion Time of 90 Days is acceptable based on termination of transfers through the affected annulus and the periodic purging of the annulus vapor space required while in this Condition.

The Note preceding Condition B is a reminder that LCO 3.8.6 also contains OPERABILITY requirements for annulus conductivity probes. Therefore, it is possible that equipment inoperability requiring entry into Condition B could also require concurrent entry into LCO 3.8.6 Condition A.

B.1.1

Verifying that the waste level in the affected annulus of a waste tank in GAS RELEASE or OPERATION MODE is less than or equal to the value stated in Table 3.8.5-1 or 3.8.5-3 within 3 Days ensures that the level in the annulus did not increase to an unacceptable point when the required annulus conductivity probe was inoperable. Administrative Control 5.8.2.7 is applicable to any instrument used to perform this SR.

The initial Completion Time of 3 Days along with the periodic 7-Day level check of SR 4.8.5.1 ensures that an increase in level will be detected when sufficient time remains to ventilate the tank annulus prior to reaching flammable conditions for the analyzed scenario of a non-seismic tank wall leak. The recurring Completion Time of 7 Days ensures that while in this Condition annulus level is checked using an alternate method at the same interval as required by SR 4.8.5.1.

(continued)

ACTIONS (continued)

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition B remains applicable).

B.1.2

Verifying that the waste level in the affected annulus of a waste tank in CHEMICAL CLEANING MODE is less than or equal to the value stated in Table 3.8.5-2 within 3 Days ensures that the level in the annulus did not increase to an unacceptable point when the required annulus conductivity probe was inoperable. Administrative Control 5.8.2.7 is applicable to any instrument used to perform this SR.

The initial Completion Time of 3 Days along with the periodic 3-Day level check of SR 4.8.5.5 ensures that an increase in level will be detected when sufficient time remains to ventilate the tank annulus prior to reaching flammable conditions for the analyzed scenario of a non-seismic tank wall leak. The recurring Completion Time of 3 Days ensures that while in this Condition annulus level is checked using an alternate method at the same interval as required by SR 4.8.5.5.

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition B remains applicable).

B.2

Restoring the required annulus leak detection instrument to OPERABLE status within 60 Days limits the period that the required equipment is allowed to be in a degraded condition. The 60-Day Completion Time is considered adequate to repair the annulus level detection instrument.

The 60-Day Completion Time is considered acceptable due to the required use of alternate monitoring methods to confirm that annulus level is within limits during this period.

(continued)

SURVEILLANCE REQUIREMENTS

4.8.5.1 Verifying that the annulus waste level is less than or equal to the required level stated in Table 3.8.5-1 or 3.8.5-3 every 7 Days ensures that the FACILITY is being operated within the assumptions of the safety analysis. SR 4.8.5.1 is only required for waste tanks in GAS RELEASE and OPERATION MODES. SR 4.8.5.5 covers waste tanks in CHEMICAL CLEANING MODE.

The surveillance frequency of 7 Days is based on the lengthy time to reach an equilibrium hydrogen concentration in a tank annulus. It also considers the time needed for an empty annulus to reach the level limit of this LCO at the maximum non-seismic leak rate analyzed. For Type III and IIIA waste tanks that have never leaked, it is allowable for the surveillance frequency to be several days longer than the interval over which a 0.4 gpm leak could reach the level limit of this LCO.

Failure to meet or perform this SR (except for an inoperable conductivity probe) requires assuming that the affected annulus is outside of its limits and entering Condition A of this LCO.

4.8.5.2 Operating forced ventilation on the annulus of Type I and II tanks (Tanks 1 - 15) for a sufficient duration to provide 12 vapor space turnovers every 85 Days ensures that even in the case that an annulus is filled with waste to the level limit of this LCO, that the peak hydrogen concentration in the annulus will not exceed 25% of the LFL. SR 4.8.5.2 is only required for waste tanks in GAS RELEASE and OPERATION MODES. SR 4.8.5.6 covers waste tanks in CHEMICAL CLEANING MODE.

The surveillance frequency of 85 Days is based on the minimum time that is needed for the annulus vapor space to increase to 25% of the LFL, crediting only atmospheric breathing while the annulus level is at the limit of this LCO.

Failure to meet or perform this SR requires entering Condition A of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.8.5.3 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 7 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. SR 4.8.5.3 is only required for waste tanks in GAS RELEASE and OPERATION MODES. SR 4.8.5.7 covers waste tanks in CHEMICAL CLEANING MODE. The surveillance frequency of 7 Days is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO if a conductivity probe is needed to perform an SR and there is no other OPERABLE conductivity probe in the same annulus. If no annulus conductivity probes are OPERABLE, LCO 3.8.6 should also be reviewed for applicability.

4.8.5.4 Conductivity probes are verified to be set at or below the value stated in Table 3.8.5-1, 3.8.5-2, or 3.8.5-3 every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO if a conductivity probe is needed to perform an SR and there is no other OPERABLE conductivity probe in the same annulus. If no annulus conductivity probes are OPERABLE, LCO 3.8.6 should also be reviewed for applicability.

4.8.5.5 Verifying that the annulus waste level is less than or equal to the required level stated in Table 3.8.5-2 every 3 Days ensures that the FACILITY is being operated within the assumptions of the safety analysis. SR 4.8.5.5 is only required for waste tanks in CHEMICAL CLEANING MODE. SR 4.8.5.1 covers waste tanks in GAS RELEASE and OPERATION MODES.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

The surveillance frequency of 3 Days is based on the time to reach an equilibrium hydrogen concentration in a tank annulus. It also considers the time needed for an empty annulus to reach the level limit of this LCO at the maximum non-seismic leak rate analyzed.

Failure to meet or perform this SR (except for an inoperable conductivity probe) requires assuming that the affected annulus is outside of its limits and entering Condition A of this LCO.

4.8.5.6 Operating forced ventilation on the annulus of Type I tanks (Tanks 1 - 8) for a sufficient duration to provide 12 vapor space turnovers every 3 Days ensures that even in the case that an annulus is filled with waste to the level limit of this LCO, that the peak hydrogen concentration in the annulus will not exceed 25% of the LFL. SR 4.8.5.6 is only required for waste tanks in CHEMICAL CLEANING MODE. SR 4.8.5.2 covers waste tanks in GAS RELEASE and OPERATION MODES.

The surveillance frequency of 3 Days is based on the minimum time that is needed for the annulus vapor space to increase to 25% of the LFL, crediting only atmospheric breathing while the annulus level is at the limit of this LCO.

Failure to meet or perform this SR requires entering Condition A of this LCO.

4.8.5.7 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 3 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. SR 4.8.5.7 is only required for waste tanks in CHEMICAL CLEANING MODE. SR 4.8.5.3 covers waste tanks in GAS RELEASE and OPERATION MODES. The surveillance frequency of 3 Days is based on engineering judgment.

(continued)

SURVEILLANCE REQUIREMENTS (continued)	Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition B of this LCO if a conductivity probe is needed to perform an SR and there is no other OPERABLE conductivity probe in the same annulus.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Residual Waste Heights in Annuli of Type III/IIIA Waste Tanks (U). S-CLC-G-00273, Westinghouse Savannah River Company, Aiken, SC.

3. Impact of Residual Waste in Annuli of Type I/II Waste Tanks (U). S-CLC-G-00274, Westinghouse Savannah River Company, Aiken, SC.

4. Type I Tank Annulus Flammability Analysis for Chemical Cleaning (U). S-CLC-G-00330, Washington Savannah River Company, Aiken, SC.

5. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.6 Annulus Leak Detection Instruments

BASES

BACKGROUND SUMMARY	Type I, II, III, and IIIA waste tanks each consist of a primary tank structure built within a secondary containment. The secondary containment consists of a reinforced concrete structure lined with a partial-height (Type I and II tanks) or full-height (Type III and IIIA tanks) steel liner. All of these waste tanks are designed with an annular region surrounding the outer wall of the primary tank. Type III and IIIA tanks also have a much smaller inner annulus in the space between the tank's center column and the inner wall of the primary tank. In many waste tanks, transfer lines pass through the annulus to connect the waste tank with underground portions of the transfer system. Transfer lines passing through the annulus are jacketed. Several Type I tanks and all Type II tanks have leaked waste into the annulus. The amount of dried residue currently remaining in the annulus from this leaked waste ranges from barely detectable quantities to thousands of gallons. There has never been leakage from a Type III or IIIA tank wall.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits the conductivity probes in Type III and IIIA tank annuli (excluding Tank 50) and their associated control room alarms (Ref. 1). The probes and alarms are credited with alerting control room operators to liquid in a LEAK DETECTION LOCATION. The operator is then able to take action before the event results in a significant surface release. It also allows timely removal of the waste to prevent/mitigate explosions. For Tank 50, no maximum initial waste volume was assumed in the accident analysis and the safety analysis does not require protection of the Tank 50 annulus volume (Ref. 1). The Type III/IIIA waste tank annulus leak detection instruments are credited in the following accident in the safety analysis: Transfer Error/SMP Waste Release (Ref. 1).

(continued)

LCO

This LCO requires that one leak detection instrument stated in Table 3.8.6-1 be OPERABLE in a waste tank annulus.

An OPERABLE leak detection instrument shall be capable of detecting an increase in liquid level above the required SETPOINT of the probe and alarming in the control room to alert operators to the condition. The SETPOINTS for the annulus conductivity probes stated in Table 3.8.6-1 reflect the actual analysis values. The effects of any instrument uncertainty will be accounted for during probe installation.

Inner annulus conductivity probes for Type IIIA tanks are excluded from the tables of this LCO because they are not capable of detecting waste accumulating in the outer annulus to a height of 5.8 inches.

It is not necessary to consider an alarming leak detection instrument inoperable, unless it is determined that the alarm has been caused by a failure of the instrument. An alarming conductivity probe has performed its function of alerting operators to a high level condition, and the conductivity probe is not required to subsequently perform any other credited function until waste is subsequently reduced below the SETPOINT of the conductivity probe.

MODE APPLICABILITY

This LCO is applicable any time a transfer line through an annulus can be involved with a HIGH-REM WASTE TRANSFER. HIGH-REM WASTE TRANSFERS are only allowed when a transfer line is in HIGH-REM TRANSFER MODE. Waste tanks can receive HIGH-REM WASTE TRANSFERS in any MODE except CHEMICAL CLEANING, MECHANICAL CLEANING, or REMOVED FROM SERVICE MODES. This LCO is applicable any time a transfer line through the Tank 40 annulus is involved with a transfer of ESP SLUDGE SLURRY.

Therefore this LCO is applicable in GAS RELEASE and OPERATION MODES, when a transfer line through the tank annulus is in HIGH-REM TRANSFER MODE and in GAS RELEASE and OPERATION MODE for an ESP SLUDGE SLURRY transfer through the Tank 40 annulus.

(continued)

PROCESS AREA APPLICABILITY

This LCO is applicable to all H-Area Tank Farm Type III and IIIA waste storage tanks, excluding Tank 48 and Tank 50. The F-Area Tank Farm Type III and IIIA waste storage tanks are excluded because no F-Area Tank Farm WASTE TRANSFERS will be HIGH-REM WASTE TRANSFERS (Ref. 1). This LCO also applies for ESP SLUDGE SLURRY transfers from Tank 51 to 40. Therefore this LCO applies to Tanks 29, 30, 31, 32, 35, 36, 37, 38, 39, 40, 41, 42, 43, 49, and 51.

Tank 48 contains waste that has the potential of producing significant quantities of benzene. This waste characteristic poses unique hazards in CST and WASTE TRANSFERS into and out of Tank 48 are prohibited. Since WASTE TRANSFERS through the Tank 48 annulus are prohibited, there is no need for this LCO to apply to Tank 48.

For Tank 50, no maximum initial waste volume was assumed in the accident analysis and the safety analysis does not require protection of the Tank 50 annulus volume (Ref. 1).

ACTIONS

The Note preceding Condition A is a reminder that LCO 3.8.5 also contains OPERABILITY requirements for annulus conductivity probes. Therefore, it is possible that equipment inoperability requiring entry into Condition A could also require concurrent entry into LCO 3.8.5 Condition B.

The Note preceding Required Action A.1 states that upon entry into Condition A, Required Action A.2 shall be completed. This Note ensures that greater than allowed quantities of waste is not left in an annulus after a transfer is terminated.

A.1

Stopping WASTE TRANSFERS, except for CONTINGENCY TRANSFERS, through the affected waste tank annulus IMMEDIATELY minimizes the amount of additional waste likely to leak into the annulus from the transfer line.

The following are not considered transfers through the affected tank annulus for compliance with this Required Action: CONTINGENCY TRANSFERS, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying an affected waste tank annulus are not prohibited. CONTINGENCY TRANSFERS have minimal impact on additional hydrogen release from the waste in the annulus.

A.2

Verifying that the waste level in the affected annulus is less than or equal to the value stated in Table 3.8.6-1 within 24 Hours ensures that the level in the annulus did not increase to an unacceptable point during the portion of the HIGH-REM WASTE TRANSFER when the required annulus conductivity probe was inoperable.

The Completion Time of 24 Hours is considered acceptable since actions have been completed to stop transfers through the affected tank annulus.

If this Required Action is not met or the Completion Time is not met, Condition B of this LCO is entered also (Condition A remains applicable).

B.1

If Required Action A.2 or the associated Completion Time is not met, Condition A of LCO 3.8.5 shall also be entered IMMEDIATELY (LCO 3.8.6 remains applicable). This Required Action will ensure that appropriate actions are taken in response to high waste level in a tank annulus.

SURVEILLANCE REQUIREMENTS

4.8.6.1 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 7 Days ensures that the instruments are capable of detecting a high level condition and annunciating it in the applicable control room. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (e.g., conductivity probe and associated circuitry and control room alarms) with the exception of a limited portion of the common return path encompassing the grounding scheme. The conductivity probe shall not be considered in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 7 Days is based on engineering judgment.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition A of this LCO if there is no other OPERABLE conductivity probe in the same annulus. If no annulus conductivity probes are OPERABLE, LCO 3.8.5 should also be reviewed for applicability.

4.8.6.2 Conductivity probes are verified to be set at or below the value stated in Table 3.8.6-1 every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition A of this LCO if there is no other OPERABLE conductivity probe in the same annulus. If no annulus conductivity probes are OPERABLE, LCO 3.8.5 should also be reviewed for applicability.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.7 Chromate Cooling Water Siphon Breakers

BASES

BACKGROUND SUMMARY

Chromate cooling water is typically circulated through coils in Type I, II, III, and IIIA waste storage tanks to remove the heat caused by the radioactive decay of fission products. These cooling coils also remove heat added to waste tanks by tank farm processes such as waste transfers, evaporator operation, and slurry pump operation.

During normal operation of the Chromate Cooling Water System, an elevated surge tank maintains the cooling water pressure within the tank cooling coils greater than the pressure of the waste external to the cooling coil. This design minimizes contamination of the Chromate Cooling Water System by ensuring that the direction of leakage, should a cooling coil lose its integrity, is from the cooling system into the waste tank. After leaking cooling coils are detected and the leaks are confirmed, they are typically removed from service. An exception to this practice has been made in Tank 30, where several cooling coils with low leak rates have been returned to service after completion of temporary repairs.

The pumps, surge tank, and heat exchangers of a Chromate Cooling Water System pump house typically provide flow and cooling for multiple sets of supply and return distribution headers. Each Chromate Cooling Water System distribution header typically services a group of waste storage tanks. For example, in H-Area Tank Farm, one set of distribution headers (supply and return) services Tanks 9 through 12, a separate set of distribution headers services Tanks 29 through 32, and a third set of distribution headers services Tanks 35 through 37.

A common supply distribution header and a common return distribution header service Tanks 29, 30, 31, and 32 and there is insufficient elevation change of the headers between the tanks to cause a siphon of waste from the tanks. Therefore, a single siphon breaker connected to the supply distribution header anywhere among the four tanks is capable of preventing a siphon from any of the four tanks through the supply distribution header. Similarly, a single siphon breaker connected to the return distribution header anywhere among the four tanks is capable of preventing a siphon from any of the four tanks through the return distribution header.

(continued)

APPLICATION TO SAFETY ANALYSIS

A waste tank siphon event has been evaluated in the DSA (Ref. 1). One set of siphon breakers is credited with preventing a siphon of waste through the Chromate Cooling Water System for Tanks 29, 30, 31, and 32. These siphon breakers are installed on the Tank 30 Chromate Cooling Water System supply and return headers.

A separate set of siphon breakers are credited with preventing a siphon of waste through the Chromate Cooling Water System for Tanks 33 and 34. These siphon breakers are installed on the Chromate Cooling Water System supply and return headers. The two tanks share the common supply and return header siphon breakers.

A separate set of siphon breakers are credited with preventing a siphon of waste through the Chromate Cooling Water System for Tank 35. These siphon breakers are installed on the Chromate Cooling Water System supply and return headers for the tank.

Following a break in the Chromate Cooling Water System, these siphon breakers will automatically open and vent air into the cooling system when local system pressure drops slightly below atmospheric pressure. Preventing a significant vacuum from developing in the tank supply and return headers will prevent waste from being siphoned out of the waste tank.

Siphon breakers are credited in the following accidents in the safety analysis: Waste Tank Siphon/Pump-Out and Seismic Event.

LCO

One supply header and one return header Chromate Cooling Water System siphon breaker shall be OPERABLE for Tanks 33 and 34. Two supply header and two return header Chromate Cooling Water System siphon breakers shall be OPERABLE for Tanks 29 through 32. Two supply header and two return header Chromate Cooling Water System siphon breakers shall be OPERABLE for Tank 35. For Tanks 29, 31, and 32, the siphon breakers shall be aligned to the Chromate Cooling Water System supply and return distribution headers.

Having siphon breakers on both the supply and return headers ensures that waste cannot be siphoned out of Tanks 29, 30, 31, 32, 33, 34, and 35 through the tank cooling coils if there is a leak from the system external to the waste tanks at a lower elevation.

(continued)

LCO (continued)	An OPERABLE siphon breaker shall be capable of opening upon decreasing Chromate Cooling Water System header pressure prior to sufficient vacuum being developed in the header to siphon waste from the waste tank and creating a vent of sufficient size to prevent siphoning of waste from a waste tank through the cooling coils. Tanks 30, 33, 34, and 35 do not require the siphon breakers to be aligned to the supply and return distribution headers. This is because the siphon breakers are either tied directly to the Chromate Cooling Water System headers for the individual tank (Tanks 30 and 35) or the siphon breakers are tied directly to the Chromate Cooling Water System distribution headers (Tanks 33 and 34). Isolating the supply and return headers from the Chromate Cooling Water System distribution headers for Tanks 33 and 34 do not prevent the siphon breakers from performing their credited function.
MODE APPLICABILITY	It is possible to siphon waste out of a waste tank whenever the waste level in the tank is above the cooling coils and there are leaks in the system both inside the tank and at a sufficiently low elevation outside of the tank. Waste level is allowed to be above the cooling coils in all MODES, however in REMOVED FROM SERVICE MODE the cooling water supply and return for the tank cooling coils shall be blanked, eliminating the possibility of a siphon in that MODE. Therefore, this LCO is applicable in GAS RELEASE and OPERATION MODES. An exception to the MODE requirement is provided if vent path(s) exist sufficient to prevent siphons through the supply and return headers. The vent paths prevent the accident of concern, precluding the need for the siphon breakers. Vent paths with a total flow opening size of 0.63 square inches (equivalent to 80% of the four 1/2-inch holes on the vent lines for the Tank 30 siphon breakers) are sufficient to prevent siphons (Ref. 2). Fully opening four 1/2-inch gate valves will provide vent paths of greater than 0.63 square inches. A smaller sized vent path shall be considered sufficient to prevent siphons only if its adequacy is documented in an engineering evaluation.

(continued)

PROCESS AREA APPLICABILITY

The safety analysis credits various sets of controls for preventing siphons in waste tanks. The controls selected for an individual tank are dependent on the design of the tank, the elevation of the tank and its waste relative to the Chromate Cooling Water System, and the configuration of the Chromate Cooling Water System distribution headers between the waste tanks and the pump houses. Type I and II tanks do not have the potential to siphon waste due to either their elevation or the system configuration. Siphoning from Type IIIA tanks (except Tank 35) is prevented by the credited cooling coils. Among Type III tanks and Tank 35, cooling coils are not seismically qualified, and are therefore credited only for the non-seismic scenario.

This LCO therefore applies only to Tanks 29, 30, 31, 32, 33, 34, and 35.

ACTIONS

The Note preceding Required Action A.1 states that LCO 3.0.4 is not applicable if Required Action A.1 is completed. This Note allows the FACILITY to enter a higher MODE while the LCO is not met (i.e., Condition A of the LCO applies).

A.

Entry into Condition A is required if one or more required Chromate Cooling Water System siphon breakers are intentionally isolated from either the supply or return headers.

Because Tanks 33 and 34 require only one siphon breaker in each header to be OPERABLE (as identified in Table 3.8.7-1), entry into Condition A for Tanks 33 and 34 requires both siphon breakers in one header to be intentionally isolated. Entry into Condition A for Tanks 33 and 34 would also be required if one siphon breaker was intentionally isolated and the other siphon breaker was inoperable in the same header.

If the siphon prevention/mitigation safety function is lost (all required breakers in the siphon breaker set are inoperable), entry into Condition C or D is required.

(continued)

ACTIONS (continued)

A.1

Verifying that the Chromate Cooling Water pump house surge tank level has observable level within 1 Hour ensures that sufficient static head is present in the Chromate Cooling Water System to prevent waste from being siphoned from associated tanks. Repeating the check of surge tank level every 1 Hour ensures that a decrease in surge tank level is detected and responded to in a timely fashion. The 1-Hour initial and recurring Completion Times are based on engineering judgment.

If this Required Action is not met or the Completion Times are not met, Condition C and/or D of this LCO is entered also (Condition A remains applicable).

A.2

Realigning the required OPERABLE siphon breakers to the Chromate Cooling Water System supply and return headers within 72 Hours restores the ability to automatically prevent the siphoning of waste out of the associated tank. Completion of Required Action A.2 allows exiting Condition A. Condition C or D may still be applicable, depending on the OPERABILITY of individual siphon breakers. The Completion Time of 72 Hours limits the time period during which operator action is allowed to substitute for the credited siphon breakers.

If this Required Action is not met and the Completion Time is not met, Condition C and/or D of this LCO is entered also (Condition A remains applicable).

The Note preceding Required Action B.1 states that LCO 3.0.4 is not applicable to MODE changes during restoration of siphon breakers. This Note allows the FACILITY to enter a higher MODE while the LCO is not met (i.e., Condition B of the LCO applies).

B.1

Entry into Condition B is required if one of the required Chromate Cooling Water System siphon breakers (<u>supply</u> / <u>return</u>) is inoperable for Tanks 29, 30, 31, 32, and 35. There are four siphon breaker sets that are addressed in Condition B. The four siphon breaker sets are the Tank 29-32 supply header siphon breakers, Tank 35 supply header siphon breakers, Tank 29-32 return header siphon breakers, and Tank 35 return header siphon breakers.

(continued)

ACTIONS (continued)

For Tanks 29, 30, 31, 32, and 35 two supply header and two return header Chromate Cooling Water System siphon breakers are required to be OPERABLE. Entry into Condition B is acceptable for these tanks with only one of two siphon breakers on the header OPERABLE, since the siphon prevention/mitigation safety function is degraded, not lost.

Restoration of an inoperable siphon breaker to the Chromate Cooling Water System supply header or return header restores full capability to the siphon breaker set (i.e., both siphon breakers on the header are OPERABLE). Required Action B.1 allows no more than one siphon breaker in each set to be inoperable. Restoration within 14 Days limits the period of time during which the siphon prevention/ mitigation safety function is degraded.

The Completion Time of 14 Days is considered sufficient to complete repairs and functionally test (as required) the Chromate Cooling Water Siphon Breaker(s).

The Note preceding Required Action C.1.1 states that LCO 3.0.4 is not applicable if Required Action C.2 is completed. This Note allows the FACILITY to enter a higher MODE while the LCO is not met (i.e., Condition C of the LCO applies).

C.1.1

Aligning an OPERABLE siphon breaker to the Chromate Cooling Water System supply header IMMEDIATELY places the system in an alignment that prevents/mitigates siphoning from the tanks through the supply header. The Completion Time of IMMEDIATELY minimizes the time period during which a Chromate Cooling Water System leak external to the waste tank has the potential to result in siphoning waste from the affected tanks.

C.1.2

The Note preceding Required Action C.1.2 states that this Required Action is not applicable to Tanks 30, 33, 34, and 35.

(continued)

ACTIONS (continued)

Aligning an OPERABLE siphon breaker to the associated supply distribution header IMMEDIATELY places the system in an alignment that prevents/mitigates siphoning from the tanks through the supply header. The Completion Time of IMMEDIATELY minimizes the time period during which a Chromate Cooling Water System leak external to the waste tank has the potential to result in siphoning waste from the affected tanks.

C.2

Isolating cooling coils in the affected tanks from the Chromate Cooling Water System supply header IMMEDIATELY places the system in an alignment that prevents siphoning from the tanks through the supply header. The Completion Time of IMMEDIATELY minimizes the time period during which a Chromate Cooling Water System leak external to the waste tank has the potential to result in siphoning waste from the affected tanks.

The Note preceding Required Action D.1.1 states that LCO 3.0.4 is not applicable if Required Action D.2 is completed. This Note allows the FACILITY to enter a higher MODE while the LCO is not met (i.e., Condition D of the LCO applies).

D.1.1

Aligning an OPERABLE siphon breaker to the Chromate Cooling Water System return header IMMEDIATELY places the system in an alignment that prevents/mitigates siphoning from the tanks through the return header. The Completion Time of IMMEDIATELY minimizes the time period during which a Chromate Cooling Water System leak external to the waste tank has the potential to result in siphoning waste from the affected tanks.

D.1.2

The Note preceding Required Action D.1.2 states that this Required Action is not applicable to Tanks 30, 33, 34, and 35.

Aligning an OPERABLE siphon breaker to the associated return distribution header IMMEDIATELY places the system in an alignment that prevents/mitigates siphoning from the tanks through the return header. The Completion Time of IMMEDIATELY minimizes the time period during which a Chromate Cooling Water System leak external to the waste tank has the potential to result in siphoning waste from the affected tanks.

(continued)

ACTIONS (continued)

D.2

Isolating cooling coils in the affected tanks from the Chromate Cooling Water System return header IMMEDIATELY places the system in an alignment that prevents siphoning from the tanks through the return header. The Completion Time of IMMEDIATELY minimizes the time period during which a Chromate Cooling Water System leak external to the waste tank has the potential to result in siphoning waste from the affected tanks.

SURVEILLANCE REQUIREMENTS

4.8.7.1 The siphon breaker isolation valves shall be verified to be open every 7 Days. This surveillance ensures that a siphon breaker that is inoperable due to inadvertent isolation from the associated distribution header is detected. The Note preceding SR 4.8.7.1 states that the SR is not required for a Chromate Cooling Water siphon breaker that is intentionally isolated from the header.

Failure to meet or perform this SR on an isolation valve for a supply header siphon breaker requires declaring the affected siphon breaker inoperable and entering Condition B or C of this LCO if another siphon breaker on the supply header is not OPERABLE. Failure to meet or perform this SR on an isolation valve for a return header siphon breaker requires declaring the affected siphon breaker inoperable and entering Condition B or D of this LCO.

4.8.7.2 The siphon breakers shall be verified to be aligned to the Chromate Cooling Water System supply and return distribution headers every 7 Days. This surveillance ensures that a siphon breaker that is inoperable due to inadvertent isolation from the associated distribution header is detected. The Note preceding SR 4.8.7.2 states that the SR is not required for Tanks 30, 33, 34, and 35 or a Chromate Cooling Water siphon breaker that is intentionally isolated from the header.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR on an isolation valve for a supply header siphon breaker requires declaring the affected siphon breaker(s) inoperable and entering Condition B or C of this LCO. Failure to meet or perform this SR on an isolation valve for a return header siphon breaker requires declaring the affected siphon breaker(s) inoperable and entering Condition B or D of this LCO.

4.8.7.3 The siphon breaker vent path shall be inspected for blockage every 90 Days. This inspection shall ensure that no obstructions or foreign materials are present in and around the vent holes near the top of the siphon breaker. Blockage of these vent holes would make the siphon breakers inoperable by preventing air from being admitted into the system to break a siphon following the loss of system pressure.

Failure to meet or perform this SR on a supply header siphon breaker requires declaring the affected siphon breaker inoperable and entering Condition B or C of this LCO. Failure to meet or perform this SR on a return header siphon breaker requires declaring the affected siphon breaker inoperable and entering Condition B or D of this LCO.

The 90-Day surveillance frequency is based on engineering judgment.

4.8.7.4 The siphon breaker shall be verified to actuate when the pressure at the component is greater than or equal to –0.5 psig every 5 Years. This surveillance may be performed through a bench test or by an in-place test of each individual siphon breaker which shows that the siphon breaker will actuate when the pressure at the inlet of the siphon breaker (i.e., the ball/seat interface) is greater than or equal to –0.5 psig.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

A pressure of -0.5 psig is equivalent to -14 inches WC. For a system containing liquid with a specific gravity of 1.0, the local pressure is 0 psig at a height 14 inches below the point that has a pressure of -0.5 psig and the local pressure is greater than atmospheric at lower elevations. Since siphon breakers are installed at a height greater than 14 inches above the concrete tank top, and the concrete tank top is several feet above the steel tank top, demonstrating that the siphon breakers will actuate upon decreasing pressure before the local pressure falls below -0.5 psig ensures that air will be vented into the system before the Chromate Cooling Water System pressure at the elevation of the steel tank top falls below atmospheric. This shows that the siphon breaker will prevent a partial vacuum from developing in the Chromate Cooling Water System at any location below the elevation of the steel tank top, thus preventing waste from being siphoned from the tank.

Failure to meet or perform this SR on a supply header siphon breaker requires declaring the affected siphon breaker inoperable and entering Condition B or C of this LCO. Failure to meet or perform this SR on a return header siphon breaker requires declaring the affected siphon breaker inoperable and entering Condition B or D of this LCO.

The 5-Year surveillance frequency is based on engineering judgment.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Tank 30 Chromate Cooling Water (CCW) Line: Vacuum Vent Size. M-CLC-H-02411, Westinghouse Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.8 Not Used

BASES

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.9 Waste Tank Purge Ventilation System – Gas Release

BASES

BACKGROUND SUMMARY

The radioactive aqueous caustic wastes received and stored in waste storage tanks continuously produce hydrogen due to the radiolysis of the contained water. Additionally during waste tank chemical cleaning, radioactive aqueous acidic wastes may produce hydrogen due to the corrosion of carbon steel components. Wastes may also contain trace amounts of organic compounds and ammonia. In addition, Tank 50 potentially contains the organic Isopar® L. The waste storage tanks are equipped with installed forced ventilation systems that purge the tank bulk vapor space to remove accumulated and evolving flammable vapors.

Hydrogen and other gases can be trapped within the settled sludge and in saltcake in the waste tank. When the sludge is agitated, it can release some or all of the trapped gases in a relatively short timeframe. Similarly, when saltcake is dissolved it can also result in a rapid release of trapped gases. Saltcake can also release trapped gases when the interstitial liquid is removed from the salt matrix. Spontaneous liberation may also occur and release hydrogen in the waste tank. The amount of trapped gases released or the rate at which they are released can be controlled by controlling waste tank mixing devices (e.g., height, speed, and rotation) for settled sludge, controlling the addition of dissolution liquid for BULK SALT DISSOLUTION, or controlling the tank liquid level/removal rate for interstitial liquid removal.

If the waste tank bulk vapor space forced ventilation system function for a waste storage tank is lost or unavailable for any reason, the flammable vapors being generated by the waste stored within the tank can start to accumulate in the tank bulk vapor space. If allowed to accumulate unchecked, the waste tank bulk vapor space may reach flammable conditions and deflagrate. Proper ventilation system operation prevents or minimizes buildup of flammable vapors in the tank bulk vapor space by providing a forced purge flow.

The Waste Tank Ventilation System includes an exhaust fan that draws suction from the tank bulk vapor space, pulls the flow through a HEPA filter, and exhausts the gases out of a stack. The other details of the Waste Tank Ventilation System vary between tank types, but typically the design includes a demister, condenser (except for Type IVs), and reheater.

(continued)

BACKGROUND SUMMARY (continued)	All waste tanks that are placed in GAS RELEASE MODE also have a control room alarm that alerts the operators to a low exhaust flow condition and low flow interlocks to stop waste tank mixing devices, dissolution liquid addition, and interstitial liquid removal for trapped gas release from settled sludge and from saltcake.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits forced ventilation on waste storage tanks (excluding Tank 50) undergoing operations with the potential for significant release of trapped hydrogen with providing sufficient purge flow rate through the tank to minimize the buildup of flammable vapors in the tank's bulk vapor space. For waste tanks in which waste tank mixing devices or transfer jets are operated, forced ventilation is also credited with preventing unfiltered releases. In waste tanks that are placed in GAS RELEASE MODE, exhaust low flow alarms and interlocks are also credited (Ref. 1). An actual purge flow rate of 72 scfm through a waste tank, (188 scfm in Tanks 40 and 51) in conjunction with Administrative Controls 5.8.2.29 and 5.8.2.30, maintains the hydrogen concentration in the waste tank's bulk vapor space less than or equal to the safety analysis limit and maintains the minimum required time to LFL for the waste tank (Ref. 1). Waste Tank Ventilation Systems are credited in the following accidents in the safety analysis: Aerosolization Events, Waste Tank Explosion, and Seismic Event (interlock only) (Ref. 1).
LCO	This LCO requires that the Waste Tank Ventilation System be OPERABLE. To be OPERABLE, all Waste Tank Ventilation Systems require an operating fan generating the required purge flow through the system, an intact flow path (e.g., ductwork, filter housing, reheater shell) from the waste tank to the fan, and an online exhaust filter capable of removing radioactive particulate from the exhaust stream. This LCO also requires that tanks in GAS RELEASE MODE have OPERABLE exhaust flow indicators, exhaust low flow control room alarms, exhaust low flow interlocks, and that the exhaust flow rate be greater than or equal to a minimum value. The minimum required value for exhaust flow is based on the safety analysis value of 72 scfm (188 scfm for Waste Tanks 40 and 51), adjusted for total instrument uncertainty (Ref. 2-15, and 18-24).

(continued)

LCO (continued)

The exhaust low flow interlocks shall stop the waste tank mixing devices on tanks undergoing bulk agitation of sludge or BULK SALT DISSOLUTION using waste tank mixing devices, shall close the dissolution liquid addition valves on tanks undergoing BULK SALT DISSOLUTION, and shall stop the transfer pump/jet on tanks undergoing interstitial liquid removal. Loss of power to the interlock shall cause the interlock to perform its safety function (i.e., stop the waste tank mixing devices, close the dissolution liquid addition valves, or stop the interstitial liquid removal pump/jet). Each exhaust low flow interlock loop consists of the components stated in Tables 3.8.9-1 and 3.8.9-2, plus the associated electrical components that allow the loop to function.

For waste tanks not currently configured with the required components (or specific uncertainty analysis is not documented within this LCO), the instrumentation shall use the same basic type of instrument serving the same function as those analyzed in uncertainty analyses referenced herein (e.g., pitot tube, orifice, differential pressure gauge, differential pressure transmitter), and the resulting uncertainties shall yield the setpoints provided in this LCO within the same surveillance frequencies.

MODE APPLICABILITY

This LCO is applicable to waste storage tanks when they have the potential to exceed the minimum required time to LFL for the applicable tank flammability classification or exceed 60% of the LFL due to a non-seismic release of trapped gas from settled sludge or saltcake. Waste storage tanks undergoing processes that have the potential to release hydrogen in sufficient quantities to exceed these criteria are placed in GAS RELEASE MODE. Therefore, this LCO is applicable in GAS RELEASE MODE.

Waste storage tank ventilation requirements for OPERATION and CHEMICAL CLEANING MODES are contained in LCO 3.8.1.

PROCESS AREA APPLICABILITY

This LCO is applicable to all waste tanks that have the potential to trap sufficient hydrogen in settled sludge or saltcake such that subsequent release of that hydrogen could exceed the minimum required time to LFL for the applicable tank flammability classification or exceed 60% of the LFL.

To minimize the potential for sludge solids to be siphoned or pumped out of Tank 39, mixing is prohibited and therefore Tank 39 must not enter GAS RELEASE MODE.

(continued)

PROCESS AREA APPLICABILITY (continued)

Tank 48 contains waste that has the potential of producing significant quantities of benzene. Therefore the analysis and controls for waste tank explosions are different for Tank 48. LCOs pertaining to Tank 48 ventilation requirements are contained in Sections 3/4.2 and 3/4.3 of the TSRs.

Tank 50 stores waste that contains Isopar® L, a potentially significant contributor to the flammable vapor concentration in the tank vapor space. Therefore the analysis and controls for Tank 50 explosions are different and Tank 50 is prohibited from entering GAS RELEASE MODE.

Therefore, this LCO is applicable to all waste tanks, excluding Tanks 39, 48, and 50.

ACTIONS

A.1

Restoring the inoperable equipment within 30 Days restores compliance with the LCO. The 30-Day Completion Time limits the period during which there is no redundant equipment available.

The 30-Day Completion Time is considered acceptable based on the reliability of a single set of equipment and the availability of a control room alarm on low exhaust flow that will prompt operator action to shut down certain processes and to restore exhaust flow.

The first Note preceding Required Action B.1 serves as a reminder that credited interlocks are normally available to perform some Required Actions. Operator action shall be taken as necessary to complete the Required Actions if the interlocks fail to perform their credited function.

B.1

The second Note preceding Required Action B.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action B.1.

(continued)

ACTIONS (continued)

Stopping liquid additions into the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that additional hydrogen-generating waste is not added to the tank while the ventilation system is in a degraded condition. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume.

The following are not considered transfers into the affected tank for compliance with this Required Action: flow from siphon break on transfer pump / jet discharge and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

B.2

Stopping WASTE TRANSFERS out of the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the ventilation system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

B.3

Ensuring waste tank mixing devices in the affected waste tank are stopped IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that there is no potential for waste to be aerosolized by the waste tank mixing devices while the ventilation system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.4

The Note preceding Required Action B.4 states that the Required Action shall not prohibit the normal air blow following jet operation. This post-operation air blow is intended to prevent suckbacks by purging the steam from the jet supply piping and does not have a significant impact on the analyzed aerosolization accident progression.

Isolating the transfer jet in the affected waste tank from its steam and air supplies IMMEDIATELY stops steam/air flow to the jet and eliminates the potential for an aerosolization event due to steam/air release. It also prevents the release of dissolved hydrogen into the affected waste tank caused by the heating of the waste by the jet. This Required Action may be completed by realignment of the gang valve, or by closing other valves upstream or downstream of the gang valve.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

B.5

Ensuring forced ventilation is operating on the affected tank within 4 Days limits the period within which hydrogen can accumulate in the tank bulk vapor space. Forced ventilation can be provided by the installed fan, or by portable equipment attached to either the purge exhaust stack or directly to a tank riser. The flow rate of the forced ventilation shall meet the minimum flow requirement of 72 scfm (188 scfm for Waste Tanks 40 and 51), unless a separate evaluation is completed to determine minimum flow requirements to maintain the hydrogen concentration in the waste tank bulk vapor space less than or equal to 25% of the LFL for the current tank contents. Verification that the minimum flow requirement is met may be based on the rated capacity of the fan or portable blower and the system alignment and requires neither initial nor subsequent periodic measurement of flow.

After forced ventilation is initiated, it should be operated to the maximum extent possible until compliance with this LCO is restored. Acceptable reasons to secure forced ventilation for limited periods include, but are not limited to, mechanical failures, interruption of electrical power, refueling of engine/generator, and alarm response.

The initial Completion Time of 4 Days ensures that forced ventilation is provided to the waste storage tank prior to the time at which the tank bulk vapor space could reach flammable conditions. Repeating this Required Action every 24 Hours ensures that a subsequent loss of ventilation is discovered in a timely manner. Since all waste storage tanks have at least 7 days to reach LFL following a loss of ventilation, the initial 4-Day Completion Time of this Required Action combined with the 24-Hour frequency of SR 4.8.9.1 ensure that loss of ventilation is detected, and flow restored, well before flammable conditions are reached.

B.6

Placing the affected tank in OPERATION MODE within 7 Days removes the waste tank from the MODE in which activities are allowed that could cause a significant release of hydrogen from settled sludge or saltcake within a short time period.

(continued)

ACTIONS (continued)

The 7-Day Completion Time is based on engineering judgment. The Completion Time limits the period over which the waste tank's ventilation system or associated interlocks are allowed to be in a degraded condition while in GAS RELEASE MODE.

The Note preceding Condition C states that this Condition is not applicable to ventilation systems that have only one installed exhaust HEPA filter or that require both exhaust HEPA filters (e.g., Tanks 19 and 21). This Condition allows shifting to an OPERABLE standby filter when multiple exhaust HEPA filters are available in the system; therefore, it is not applicable to those systems with only one filter or which require both filters. If the exhaust HEPA filter is declared inoperable on a ventilation system that has only one installed filter or requires both filters, then Condition B of this LCO shall be entered.

C.1

Placing an OPERABLE exhaust HEPA filter in service IMMEDIATELY minimizes the time that an unfiltered ventilation exhaust stream condition potentially exists. This Required Action allows shifting to an OPERABLE standby exhaust HEPA filter (and removing the inoperable exhaust HEPA filter from service) when a standby HEPA is available in the system.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

If this Required Action is not met and the Completion Time is not met, Condition B of this LCO is entered also (Condition C remains applicable).

SURVEILLANCE REQUIREMENTS

4.8.9.1 Verifying exhaust flow is greater than or equal to the value stated in Tables 3.8.9-1 and 3.8.9-2 every 24 Hours ensures that sufficient purge flow is provided through these tanks to maintain hydrogen concentration in the tank bulk vapor space less than or equal to the safety analysis limit and maintain the minimum required time to LFL.

The frequency of 24 Hours is based on engineering judgment, including consideration that the minimum allowed time to reach LFL in any waste storage tank following loss of ventilation is 7 days and the presence of low flow control room alarms.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR requires assuming that the affected exhaust flow is outside of its limits and entering Condition B of this LCO.

4.8.9.2 An INSTRUMENT LOOP TEST of the hardwired interlock functions stated in Tables 3.8.9-1 and 3.8.9-2 for the exhaust low flow interlock shall be performed every 1 Year to ensure the OPERABILITY of the interlock circuitry. This test shall verify with simulated input signal that the required equipment receives the proper signal to direct the actions outlined in the footnotes of Table 3.8.9-1 and 3.8.9-2 when required. A successful completion of this test will ensure the required equipment receives the signal directing the actions required by this interlock at a SETPOINT within the requirements of Table 3.8.9-1 and 3.8.9-2.

The 1-Year surveillance frequency is considered adequate to track and trend the instrument performance and is based on equipment reliability.

Failure to meet or perform this SR requires declaring the affected interlock inoperable and entering Condition A and/or B of this LCO.

4.8.9.3 The dissolution liquid addition valve shall be verified every 1 Year to close when directed by a simulated or actual interlock signal. This SR verifies that this valve performs the necessary action when an interlock requires this valve to close. SR 4.8.9.3 is only required for tanks that are in GAS RELEASE MODE due to performance of BULK SALT DISSOLUTION operations.

The 1-Year surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

Failure to meet or perform this SR requires declaring the affected valve inoperable and entering Condition A and/or B of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.8.9.4 The power supplies to the waste tank mixing devices shall be verified every 1 Year to de-energize when directed by a simulated or actual interlock signal. This SR verifies that this equipment performs the necessary action when an interlock requires the waste tank mixing devices to stop. SR 4.8.9.4 is only required for tanks that are in GAS RELEASE MODE due to performance of sludge agitation operations or BULK SALT DISSOLUTION operations using waste tank mixing devices.

The 1-Year surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

Failure to meet or perform this SR requires declaring the affected equipment inoperable and entering Condition A and/or B of this LCO.

4.8.9.5 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the required exhaust flow loop including the control room alarm. Performance of this SR ensures that the instrumentation that senses exhaust flow and provides the control room alarm and input to the interlock loops required by Table 3.8.9-1 and 3.8.9-2 is maintained in a sufficiently accurate condition. The frequency of 1 Year is consistent with the uncertainty analysis for this instrument (Ref. 2-15, and 18-22).

Failure to meet or perform this SR requires declaring the affected exhaust flow loop inoperable and entering Condition A and/or B of this LCO.

4.8.9.6 An in-place performance test shall be performed every 18 Months on the HEPA filters stated in Tables 3.8.9-1 and 3.8.9-2. The efficiency of the HEPA filter shall be greater than or equal to 99.5%. The ventilation system must be operating normally (i.e., normal system flow) during the performance test of the HEPA filter.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

The frequency of 18 Months is based on the guidance provided in References 16 and 17.

Failure to meet or perform this SR requires declaring the affected HEPA filter inoperable and entering Condition B of this LCO if no other OPERABLE exhaust HEPA filter is available in the system or entering Condition C of this LCO if another OPERABLE HEPA filter is available in the system.

4.8.9.7 The transfer pump/jet for interstitial liquid removal shall be verified to stop when directed by a simulated or actual interlock signal every 1 Year. This SR verifies that this equipment performs the necessary action when an interlock requires the transfer motive force to stop. SR 4.8.9.7 is only required for tanks that are in GAS RELEASE MODE due to performance of interstitial liquid removal operations.

The 1-Year surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

Failure to meet or perform this SR requires declaring the affected equipment inoperable and entering Condition A and/or B of this LCO.

4.8.9.8 Performance of an INSTRUMENT LOOP TEST on each required alarm every 7 Days ensures that the instrument alarm circuitry is capable of detecting a low flow condition and annunciating it in the applicable control room. The surveillance frequency of 7 Days is based on loop failure probability analysis (Ref. 25). This SR is applicable only to the alarms in the H-Area Tank Farm that utilize fiber optic cable, since these are the only alarms for which the loop failure probability analysis is applicable.

Failure to meet or perform this SR requires declaring the affected equipment inoperable and entering either Condition A and/or B of this LCO.

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation Tank 7 Ventilation Flow Loops: FL-241-123-HV-FE-2127 and FL-241-123-HV-FE-2127A (U). J-CLC-F-00310, Westinghouse Savannah River Company, Aiken, SC.

3. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 19 (U). J-CLC-F-00216, Washington Savannah River Company, Aiken, SC.

4. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 26-28 and 44-47 (U). J-CLC-F-00303, Westinghouse Savannah River Company, Aiken, SC.

5. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 33 and 34 (U). J-CLC-F-00304, Westinghouse Savannah River Company, Aiken, SC.

6. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 38, 40 and 43 (U). J-CLC-H-00777, Westinghouse Savannah River Company, Aiken, SC.

7. Instrumentation Uncertainties Evaluation HV Purge Exhaust Flow Tanks 42, 50, and 51. J-CLC-H-00778, Westinghouse Savannah River Company, Aiken, SC.

8. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 29 and 31 (U). J-CLC-H-00779, Westinghouse Savannah River Company, Aiken, SC.

9. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 49 (U). J-CLC-H-00781, Westinghouse Savannah River Company, Aiken, SC.

10. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 35, 36, and 37. J-CLC-H-00791, Westinghouse Savannah River Company, Aiken, SC.

11. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 30 and 32. J-CLC-H-00792, Westinghouse Savannah River Company, Aiken, SC.

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REFERENCES (continued)

12. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 13. J-CLC-H-00797, Westinghouse Savannah River Company, Aiken, SC.

13. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 41. J-CLC-H-00813, Westinghouse Savannah River Company, Aiken, SC.

14. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 3. J-CLC-F-00317, Westinghouse Savannah River Company, Aiken, SC.

15. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 11. J-CLC-H-00827, Westinghouse Savannah River Company, Aiken, SC.

16. Testing of Nuclear Air Treatment Systems. ASME N510-1989, American Society of Mechanical Engineers, New York, December 1989.

17. Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants. Regulatory Guide 1.52, Office of Nuclear Regulatory Research, USNRC.

18. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tanks 40 and 51. J-CLC-H-00866, Washington Savannah River Company, Aiken, SC.

19. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 51. J-CLC-H-00871, Westinghouse Savannah River Company, Aiken, SC.

20. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 25. J-CLC-F-00332, Westinghouse Savannah River Company, Aiken, SC.

21. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 28. J-CLC-F-00337, Westinghouse Savannah River Company, Aiken, SC.

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REFERENCES (continued)

22. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Tank 42. J-CLC-H-00870, Westinghouse Savannah River Company, Aiken, SC.

23. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Required DP Indication for Specific Flow Values. J-CLC-F-00342, Washington Savannah River Company, Aiken, SC.

24. Instrumentation Uncertainties Evaluation Waste Tank Purge Exhaust Flow Required DP Indication for Specific Flow Values. J-CLC-H-00900, Washington Savannah River Company, Aiken, SC.

25. Assessment of Safety Class Alarm Loops for the H-Tank Farm Control Room Consolidation Project. J-CLC-H-00865, Westinghouse Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.10 Hydrogen Monitoring – Gas Release

BASES

BACKGROUND SUMMARY

The radioactive aqueous caustic wastes received and stored in waste storage tanks continuously produce hydrogen due to the radiolysis of the contained water. Additionally during waste tank chemical cleaning, radioactive aqueous acidic wastes may produce hydrogen due to the corrosion of carbon steel components. Wastes may also contain trace amounts of organic compounds and ammonia. In addition, Tank 50 potentially contains the organic Isopar® L. The waste storage tanks are equipped with installed forced ventilation systems that purge the tank bulk vapor space to remove accumulated and evolving flammable vapors.

Hydrogen and other gases can be trapped within the settled sludge and in saltcake in the waste tank. When the sludge is agitated, it can release some or all of the trapped gases in a relatively short timeframe. Similarly, when saltcake is dissolved it can also result in a rapid release of trapped gases. Saltcake can also release trapped gases when the interstitial liquid is removed from the salt matrix. Spontaneous liberation may also occur and release hydrogen in the waste tank. The amount of trapped gases released or the rate at which they are released can be controlled by controlling waste tank mixing devices (e.g., height, speed, and rotation) for settled sludge, controlling the addition of dissolution liquid for BULK SALT DISSOLUTION, or controlling the tank liquid level/removal rate for interstitial liquid removal.

If the waste tank bulk vapor space forced ventilation system function for a waste storage tank is lost or unavailable for any reason, the flammable vapors being generated by the waste stored within the tank can start to accumulate in the tank bulk vapor space. If allowed to accumulate unchecked, the waste tank bulk vapor space may reach flammable conditions and deflagrate.

All waste tanks that are placed in GAS RELEASE MODE are equipped with installed LFL monitors. These LFL monitors draw a sample of gas directly from the waste tank's bulk vapor space and provide an indication of the hydrogen concentration to the operator. These installed LFL monitors also provide an alarm to the control room on high hydrogen concentration and an alarm to the control room on low sample flow.

(continued)

APPLICATION TO SAFETY ANALYSIS	The safety analysis credits hydrogen monitoring on waste storage tanks (excluding Tank 50) undergoing operations with the potential for significant release of trapped hydrogen with detecting an increase in hydrogen concentration in a waste tank above the normal operating range. When detection of a high hydrogen concentration occurs, interlocks will actuate to stop activities that have the potential of releasing hydrogen to the tank bulk vapor space. In addition, operator action will occur to ensure that purge ventilation is provided to the waste tank. Hydrogen monitoring on waste tanks is credited in the following accidents in the safety analysis: Waste Tank Explosion and Seismic Event (Ref. 1).
LCO	This LCO requires that the waste tank bulk vapor space hydrogen concentration be less than or equal to the tank-specific LFL limit stated in the ERD (Ref. 5) and that the hydrogen monitoring components stated in Table 3.8.10-1 be OPERABLE. This LCO also requires that tanks in GAS RELEASE MODE have an OPERABLE LFL monitor, high hydrogen concentration control room alarm, and high hydrogen concentration interlock. Because changes in waste tank conditions and planned operations may occur, the LFL limit of an individual waste tank may change. Therefore, instead of stating the LFL limits directly in this LCO, reference is made to the ERD (Ref. 5). The ERD will be programmatically controlled in accordance with Administrative Control 5.8.2.27 and will reflect the LFL limit for each individual waste tank. The LCO value stated in the ERD (Ref. 5) is based on the safety analysis limit, also determined by Administrative Control 5.8.2.27, and protects the minimum required time to LFL for the waste tank. The LFL limit stated in the ERD (Ref. 5) is accounts for potential organics and total instrument uncertainty (Ref. 2-4). The high hydrogen concentration interlock shall stop the waste tank mixing devices on tanks undergoing bulk agitation of sludge or BULK SALT DISSOLUTION using waste tank mixing devices, shall close the dissolution liquid addition valve on tanks undergoing BULK SALT DISSOLUTION, and shall stop the transfer pump/jet on tanks undergoing interstitial liquid removal. Loss of power to the interlock shall cause the interlock to perform its safety function (i.e., stop the waste tank mixing devices, close the dissolution liquid addition valve, or stop the interstitial liquid removal pump/jet).

(continued)

LCO (continued)	For the LFL monitor to be OPERABLE, it must be provided sample flow at a rate within the limits of the instrument's uncertainty analysis. In order to maintain actual sample flow to the instrument within the required range, the indicated sample flow must be within the values stated in Table 3.8.10-1. The indicated sample flow requirements include the total instrument uncertainty of the rotameter used to measure sample flow (Ref. 2, 3). The low sample flow control room alarm is credited to indicate a potential loss of the motive force for sample flow (e.g., instrument air to the aspirator). The SETPOINT of the low sample flow alarm is not required to be set at a value that protects the uncertainty analysis of the LFL monitor. For waste tanks not currently configured with the required components (or specific uncertainty analysis is not documented within this LCO), the instrumentation shall use the same basic type of instrument serving the same function as those analyzed in uncertainty analyses referenced herein, and the resulting uncertainties shall yield the setpoints provided in this LCO within the same surveillance frequencies.
MODE APPLICABILITY	This LCO is applicable to waste storage tanks when they have the potential to exceed the minimum required time to LFL for the applicable tank flammability classification or exceed 60% of the LFL due to a non-seismic release of trapped gas from settled sludge or saltcake. Waste storage tanks undergoing processes that have the potential to release hydrogen in sufficient quantities to exceed these criteria are placed in GAS RELEASE MODE. Therefore, this LCO is applicable in GAS RELEASE MODE. Waste storage tank hydrogen monitoring requirements for OPERATION and CHEMICAL CLEANING MODES are contained in LCO 3.8.2 and LCO 3.8.3.
PROCESS AREA APPLICABILITY	This LCO is applicable to all waste tanks that have the potential to trap sufficient hydrogen in settled sludge or saltcake such that subsequent release of that hydrogen could exceed the minimum required time to LFL for the applicable tank flammability classification or exceed 60% of the LFL. To minimize the potential for sludge solids to be siphoned or pumped out of Tank 39, mixing is prohibited and therefore Tank 39 must not enter GAS RELEASE MODE.

(continued)

PROCESS AREA APPLICABILITY (continued)

Tank 48 contains waste that has the potential of producing significant quantities of benzene. Therefore the analysis and controls for waste tank explosions are different for Tank 48. LCOs pertaining to Tank 48 flammability monitoring requirements are contained in Sections 3/4.2 and 3/4.3 of the TSRs.

Tank 50 stores waste that contains Isopar® L, a potentially significant contributor to the flammable vapor concentration in the tank vapor space. Therefore the analysis and controls for Tank 50 explosions are different and Tank 50 is prohibited from entering GAS RELEASE MODE.

Therefore, this LCO is applicable to all waste tanks, excluding Tanks 39, 48, and 50.

ACTIONS

The first Note preceding Required Action A.1 serves as a reminder that credited interlocks are normally available to perform some Required Actions. Operator action shall be taken as necessary to complete the Required Actions if the interlocks fail to perform their credited function.

A.1

The second Note preceding Required Action A.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action A.1.

Stopping liquid additions into the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste and that additional hydrogen-generating waste is not added to the tank while the hydrogen monitoring system is in a degraded condition or hydrogen concentration is greater than its allowed value. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space due to the effect of the jet heating the transferred waste. Stopping liquid additions also limits the reduction of the available tank vapor space volume.

The following are not considered transfers into the affected tank for compliance with this Required Action: flow from siphon break on transfer pump / jet discharge and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

A.2

Stopping WASTE TRANSFERS out of the affected waste tank IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the hydrogen monitoring system is in a degraded condition or hydrogen concentration is greater than its allowed value.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.3

Ensuring waste tank mixing devices in the affected waste tank are stopped IMMEDIATELY ensures that minimal additional hydrogen will be released from the waste while the hydrogen monitoring system is in a degraded condition or hydrogen concentration is greater than its allowed value.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.4

Ensuring forced ventilation is operating on the affected tank within 24 Hours limits the period during which hydrogen can accumulate in the tank bulk vapor space. Forced ventilation can be provided by the installed fan, or by portable equipment attached to either the purge exhaust stack or directly to a tank riser. The flow rate of the forced ventilation shall meet the minimum flow requirement of 72 scfm (188 scfm for Waste Tanks 40 and 51), unless a separate evaluation is completed to determine minimum flow requirements to maintain the hydrogen concentration in the waste tank bulk vapor space less than or equal to 25% of the LFL for the current tank contents.

After forced ventilation is initiated, it should be operated to the maximum extent possible until the hydrogen concentration is reduced to within limits. Acceptable reasons to secure forced ventilation for limited periods include, but are not limited to, mechanical failures, interruption of electrical power, refueling of engine/generator, and alarm response.

The initial Completion Time of 24 Hours is considered acceptable based on the requirement that all waste storage tanks be maintained such that they have at least 7 days to reach flammable conditions following loss of ventilation. The 12-Hour frequency of checking forced ventilation operation ensures that a loss of ventilation is detected, and flow restored, before flammable conditions are reached.

A.5

Placing the affected tank in OPERATION MODE within 7 Days removes the waste tank from the MODE in which activities are allowed that could cause a significant release of hydrogen from settled sludge or saltcake within a short time period.

The 7-Day Completion Time is based on engineering judgment. The Completion Time limits the period over which the waste tank's hydrogen monitoring system or associated interlocks are allowed to be in a degraded condition while in GAS RELEASE MODE.

(continued)

SURVEILLANCE REQUIREMENTS

4.8.10.1 Not Used

4.8.10.2 Verifying that the sample flow to the installed waste tank LFL monitor is within limits every 24 Hours ensures that the instrument is operating within the constraints of its uncertainty analysis.

The surveillance frequency of 24 Hours is based on operational experience and engineering judgment. It includes consideration of the presence of a low sample flow alarm to notify operators of a total loss of sample flow.

Failure to meet or perform this SR requires declaring the affected LFL monitor inoperable and entering Condition A of this LCO if no other LFL monitor is OPERABLE on the affected tank.

4.8.10.3 Performing an INSTRUMENT LOOP CHECK on the installed waste tank LFL monitor every 7 Days is intended to detect a gross failure of the instrument between the calibrations of SR 4.8.10.4. This INSTRUMENT LOOP CHECK shall verify that the hydrogen concentration measurement is consistent with a similar measurement from another instrument (e.g., second installed LFL monitor, portable LFL monitor, or gas chromatograph).

The 7-Day surveillance frequency is based on engineering judgment and is considered adequate to ensure that a problem with the hydrogen analyzers will be detected in a timely manner.

Failure to meet or perform this SR requires declaring the affected LFL monitor inoperable and entering Condition A of this LCO if no other LFL monitor is OPERABLE on the affected tank.

4.8.10.4 An INSTRUMENT LOOP CALIBRATION shall be performed on the required hydrogen analyzers every 60 Days. Performance of this SR ensures that the instrumentation that senses flammable vapor concentration and provides the control room alarm and input to the interlock loops required by Table 3.8.10-1 is maintained in a sufficiently accurate condition.

The 60-Day surveillance frequency is based on the instrument uncertainty analysis and is consistent with manufacturer’s recommendations (Ref. 2, 3).

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR requires declaring the affected LFL monitor inoperable and entering Condition A of this LCO if no other LFL monitor is OPERABLE on the affected tank.

4.8.10.5 An INSTRUMENT LOOP TEST of the hardwired interlock functions stated in Table 3.8.10-1 for the high hydrogen concentration interlock shall be performed every 1 Year to ensure the OPERABILITY of the interlock circuitry. This test shall verify with simulated input signal that the required equipment receives the proper signal to direct the actions outlined in the footnotes of Table 3.8.10-1 when required. A successful completion of this test will ensure the required equipment receives the signal directing the actions required by this interlock at a SETPOINT within the requirements of Table 3.8.10-1.

The 1-Year surveillance frequency is considered adequate to track and trend the instrument performance and is based on equipment reliability.

Failure to meet or perform this SR requires declaring the affected interlock inoperable and entering Condition A of this LCO.

4.8.10.6 The dissolution liquid addition valve shall be verified every 1 Year to close when directed by a simulated or actual interlock signal. This SR verifies that this valve performs the necessary action when an interlock requires this valve to close. SR 4.8.10.6 is only required for tanks that are in GAS RELEASE MODE due to performance of BULK SALT DISSOLUTION operations.

The 1-Year surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

Failure to meet or perform this SR requires declaring the affected valve inoperable and entering Condition A of this LCO.

4.8.10.7 The power supplies to the tank's waste tank mixing devices shall be verified every 1 Year to de-energize when directed by a simulated or actual interlock signal. This SR verifies that this equipment performs the necessary action when an interlock requires the waste tank mixing devices to stop.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 4.8.10.7 is only required for tanks that are in GAS RELEASE MODE due to performance of sludge agitation operations or BULK SALT DISSOLUTION operations using waste tank mixing devices.

The 1-Year surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

Failure to meet or perform this SR requires declaring the affected equipment inoperable and entering Condition A of this LCO.

4.8.10.8 An INSTRUMENT LOOP CHECK shall be performed on the required sample flow indicators every 180 Days. Performing an INSTRUMENT LOOP CHECK ensures that a gross failure of the instrument has not occurred. The INSTRUMENT LOOP CHECK shall include a verification that indicated flow drops below the lowest non-zero division on the scale when air flow through the rotameter is isolated. Indicated flow dropping below this value ensures that foreign material or deposits within the rotameter are not preventing the rotameter from indicating low flow conditions.

The 180-Day surveillance frequency is based on engineering judgment and operating experience and is considered adequate to monitor adverse trends in instrumentation performance.

Failure to meet or perform this SR requires declaring the affected LFL monitor inoperable and entering Condition A of this LCO if no other LFL monitor is OPERABLE on the affected tank.

4.8.10.9 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the required installed LFL monitor low sample flow control room alarms. Performance of this SR ensures that the instrumentation that senses sample flow and provides input to the control room alarms stated in Table 3.8.10-1 is maintained in a sufficiently accurate condition. The frequency of 1 Year is based on engineering judgment and is considered adequate to monitor adverse trends in instrumentation performance.

Failure to meet or perform this SR requires declaring the affected alarm inoperable and entering Condition A of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.8.10.10 The transfer pump/jet for interstitial liquid removal shall be verified to stop when directed by a simulated or actual interlock signal every 1 Year. This SR verifies that this equipment performs the necessary action when an interlock requires the transfer motive force to stop. SR 4.8.10.10 is only required for tanks that are in GAS RELEASE MODE due to performance of interstitial liquid removal operations.

The 1-Year surveillance frequency is considered adequate based on equipment reliability, experience, and engineering evaluation.

Failure to meet or perform this SR requires declaring the affected equipment inoperable and entering Condition A of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation Waste Tank LFL Monitors (excluding Tanks 7 and 48). J-CLC-G-00048, Westinghouse Savannah River Company, Aiken, SC.

3. Instrumentation Uncertainties Evaluation Waste Tank 7 LFL Monitors Loops: FL-241-907-HV-AT-2900 A&B. J-CLC-F-00309, Westinghouse Savannah River Company, Aiken, SC.

4. J.M. Mullaney, Combined Effects of Instrument Uncertainties and Organics on LCO Value. WSMS-LIC-M-02-0052, Westinghouse Safety Management Solutions LLC, Aiken, SC, November 2002.

5. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.11 Area Radiation Monitoring – Waste Storage Tanks

BASES

BACKGROUND SUMMARY	Area Radiation Monitors (ARMs) are positioned to support waste tank mixing operations using Submersible Mixer Pumps (SMPs) or chemical/mechanical cleaning operations in accordance with the ARM Location Program. These ARMs provide adequate coverage to detect a significant above-ground release (e.g., leak, explosion, aerosolization). There are three types of ARMs that monitor waste storage tank operation. The ARM types include: • Hardwired – permanent ARM with local indication and remote control room alarm capability. • Portable – local indication only. Does not have control room alarm capability. • Wireless – ARM with local indication that houses a transmitter for remote control room alarm capability. These instruments are used to detect releases and alarm to alert the operators to unusual conditions. The ARM Location Program determines the alarm requirements (e.g., control room, local) for each of the required ARMs.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits ARMs with detecting a release from an operating SMP or from operations involved with waste tank chemical or mechanical cleaning (Ref. 1). The ARMs allow control room notification capabilities for waste releases to initiate operator actions to mitigate the release consequences. This function is required during SMP operation, waste tank chemical cleaning (during waste tank mixing device operation), or waste tank mechanical cleaning (during crawler lancing device operation from pressure sources greater than 10,000 psi). During SMP operation in GAS RELEASE, OPERATION, and CHEMICAL CLEANING MODES, the ARM is credited with reducing the risk of a Waste Tank Explosion (SMP Column Explosion) event, based on the higher risk of an ignition source being present at this time. The ARMs are also credited with mitigating the consequences of an SMP Waste Release in these MODES.

(continued)

APPLICATION TO SAFETY ANALYSIS (continued)	During crawler lancing device operation from pressure sources greater than 10,000 psi in MECHANICAL CLEANING MODE and during waste tank mixing device operation in CHEMICAL CLEANING MODE, the ARM is credited with mitigating the consequences of an aerosolization event. ARMs for waste storage tanks are credited in the following accidents in the safety analysis: Transfer Error/SMP Waste Release, Aerosolization Events, and Waste Tank Explosion (Ref. 1).
LCO	This LCO specifies that the hardwired, portable, and/or wireless ARMs specified in accordance with the ARM Location Program as required to provide coverage for waste storage tanks shall be OPERABLE. An OPERABLE ARM shall be capable of detecting area radiation levels and alerting operators (e.g., control room alarm, local alarm) when a pre-determined SETPOINT is reached. The ARM Location Program determines the necessary ARM positioning required to support the applicable waste storage tank operation and determines the alarm requirements (e.g., control room and/or local) for each ARM. The alarm SETPOINTS of the ARMs shall be established and adjusted in accordance with the standard practices of the Radiological Protection Program. During SETPOINT changes to the hardwired and wireless ARMs, the ARM shall not be considered inoperable, as the SETPOINT change is virtually instantaneous. The ARM Location Program will consider appropriate parameters (e.g., area topography, rem/gallon, shielding obstructions between potential leak locations, and ARM locations) when determining the number and position of ARMs necessary for the respective waste storage tank operation (e.g., SMP operation, mechanical cleaning operation).
MODE APPLICABILITY	ARMs are required to be OPERABLE whenever an SMP is in operation (i.e., pump running) in a waste tank, since the potential for an SMP waste release event exists whenever an SMP is in operation. Additionally during SMP operation, the ARM is credited with reducing the risk of an SMP column explosion event. SMP operation is permitted in GAS RELEASE, OPERATION, and CHEMICAL CLEANING MODES.

(continued)

MODE APPLICABILITY (continued)

ARMs are also required to be OPERABLE whenever waste tank mixing devices are in operation during chemical cleaning or whenever crawler lancing devices are in operation from pressure sources greater than 10,000 psi during mechanical cleaning in a waste tank, since the potential for an aerosolization event exists. The ARM is credited with mitigating the consequences of an aerosolization event during these operations. Waste tank chemical cleaning is permitted only in CHEMICAL CLEANING MODE. Waste tank mechanical cleaning operation is permitted only in MECHANICAL CLEANING MODE.

Therefore, this LCO is applicable in GAS RELEASE and OPERATION MODES during SMP operation, CHEMICAL CLEANING MODE during waste tank mixing device operation, and MECHANICAL CLEANING MODE during crawler lancing device operation from pressure sources greater than 10,000 psi.

PROCESS AREA APPLICABILITY

This LCO applies to waste storage tanks that have SMP(s) installed in them. SMPs are permitted to be operated in Type I, II, III, and IIIA waste tanks with the exception of Tanks 39, 48, and 50. To minimize the potential for sludge solids to be siphoned or pumped out of Tank 39, SMP operation is prohibited in Tank 39. Tanks 48 and 50 are prohibited from SMP operation because the SMP configuration has not been analyzed for those waste tanks (Ref. 1).

This LCO also applies to waste storage tanks that can undergo chemical or mechanical cleaning operations. Chemical cleaning is permitted only on F-Area Type I waste tanks. Mechanical cleaning is only permitted on Type IV waste tanks.

ACTIONS

A.1

Stopping waste tank mixing devices in the affected waste tank IMMEDIATELY minimizes the amount of additional waste potentially released at that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

ACTIONS (continued)

A.2

Stopping crawler lancing device operations in the affected waste tank IMMEDIATELY minimizes the amount of additional waste potentially released at that location.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

SURVEILLANCE REQUIREMENTS

4.8.11.1 Verifying the alarm status of portable ARM(s) every 15 Minutes ensures that a high radiation condition detected by an ARM is communicated to the control room or outside FACILITY personnel, allowing mitigative actions to be initiated.

Failure to meet or perform this SR for a specific portable ARM requires assuming that the affected ARM radiation level is outside of its limits and entering Condition A of this LCO.

4.8.11.2 Verifying that the indicated radiation levels on the hardwired and portable ARM(s) are within the range of the meter every 24 Hours ensures that a gross failure of the instrument has not occurred. The hardwired and portable ARM(s) are designed to maintain an on-scale reading, even in the absence of an external radiation source. The 24 Hour surveillance frequency is based on engineering judgment.

Failure to meet or perform this SR for a specific hardwired and portable ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

4.8.11.3 Performance of an INSTRUMENT LOOP TEST on each credited wireless ARM every 24 Hours ensures that the instruments are capable of detecting an increased radiation level and annunciating it in the applicable control room. This SR is not applicable to a hardwired or portable ARM. The INSTRUMENT LOOP TEST ensures that a gross failure of the instrument has not occurred. The wireless ARM shall not be considered inoperable or in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 24 Hours is based on engineering judgment.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet or perform this SR for a specific wireless ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

4.8.11.4 Performance of a SOURCE CHECK on the ARM(s) ensures that the instruments are capable of providing required alarms to warn personnel of increasing radiation levels. The ARM shall not be considered inoperable or in alarm status during the performance of the SOURCE CHECK. The 90-Day surveillance frequency is adequate to ensure that the ARM(s) are capable of detecting the events that they are credited for in the safety analysis.

Failure to meet or perform this SR for a specific ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

4.8.11.5 Performance of an INSTRUMENT LOOP CALIBRATION on the ARM(s) ensures that the instruments are accurately sensing and indicating radiation levels. The 1-Year surveillance frequency is based on engineering judgment.

Failure to meet or perform this SR for a specific ARM requires declaring the affected instrument inoperable and entering Condition A of this LCO if no other ARM is available which meets the requirements of this LCO in the required location.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.12 Submersible Mixer Pump Risers

BASES

BACKGROUND SUMMARY	The SMP is installed into Waste Tanks through risers. The flush piping, which will be pressurized with waste during SMP operations, is also in the same risers. The risers are designed to direct any leakage back into the tank. In some risers the drain may not be sufficient to permit the leakage to drain into the tank. A conductivity probe is located in the SMP risers that have not been shown to be free-draining. These instruments are used to detect leaks and send an interlock signal to shut the SMP off on high riser level.
APPLICATION TO SAFETY ANALYSIS	The safety analysis (Ref. 1) credits the conductivity probes in the SMP risers and their associated interlocks during SMP operation. The probes and interlocks are credited with stopping the SMP following a waste leak into an SMP riser. The SMP riser leak detection instruments are credited in the following accidents in the safety analysis: Transfer Error/SMP Waste Release and Seismic Event (Ref. 1).
LCO	This LCO requires that the waste level in the SMP risers that have not been shown to be free-draining be less than or equal to the values stated in Table 3.8.12-1. The volume of waste allowed to accumulate in SMP risers is limited to the volume in the location below the height of the leak detection conductivity probe. This allows the conductivity probe to detect an increasing level in the riser that would occur due to a leak and stop the SMP via interlock actuation. This LCO also requires that the leak detection instrument stated in Table 3.8.12-1 be OPERABLE in an SMP riser during SMP operation. An OPERABLE leak detection instrument must be capable of detecting an increase in liquid level above the required SETPOINT of the probe and interlocking to shut the SMP off. The required SETPOINTS of Table 3.8.12-1 allow the conductivity probe to detect an increasing level in the riser that would occur due to a leak and stop the SMP (no specific safety analysis value is required to be protected).

(continued)

MODE APPLICABILITY	SMP riser leak detection instruments are required to be OPERABLE whenever SMPs are in operation (i.e., pump running) in SMP risers that have not been shown to be free-draining. SMP operation is permitted in Type I, II, III and IIIA tanks in GAS RELEASE, OPERATION and CHEMICAL CLEANING MODES (excluding Tank 48). Therefore, this LCO is applicable to the waste tanks in GAS RELEASE, OPERATION and CHEMICAL CLEANING MODES while installed SMPs are operating.
PROCESS AREA APPLICABILITY	This LCO applies to the waste tanks that have installed SMPs in risers that have not been shown to be free-draining. Therefore, this LCO applies to waste tanks for which the SMP riser leak detection components stated in Table 3.8.12-1 are installed and credited.
ACTIONS	A.1 The Note preceding Required Action A.1 serves as a reminder that credited interlocks are normally available to perform the Required Action. Operator action shall be taken as necessary to complete the Required Action if the interlock fails to perform the credited function. Stopping SMP operations associated with the affected riser IMMEDIATELY minimizes the amount of additional waste that could potentially leak into the SMP riser when waste level is higher than its allowed value or when the riser level monitoring system is in a degraded condition. The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

(continued)

SURVEILLANCE REQUIREMENTS

4.8.12.1 Performance of an INSTRUMENT LOOP TEST on each required conductivity probe every 7 Days ensures that the instruments are capable of detecting a high level condition. The INSTRUMENT LOOP TEST verifies the OPERABILITY of the entire INSTRUMENT LOOP (i.e., conductivity probe and associated circuitry) with the exception of a limited portion of the common return path encompassing the grounding scheme. This test is not required to include the interlock function, which is addressed by SR 4.8.12.2. The conductivity probe and loop shall not be considered inoperable or in alarm status during the performance of the INSTRUMENT LOOP TEST. The surveillance frequency of 7 Days is based on engineering judgment.

Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition A of this LCO.

4.8.12.2 An INSTRUMENT LOOP TEST of the hardwired interlock function stated in Table 3.8.12-1 for the SMP Riser leak detection interlock shall be performed every 1 Year to ensure the OPERABILITY of the interlock circuitry. This test shall verify with simulated input signal that the required equipment receives the proper signal to direct the actions outlined in the footnote of Table 3.8.12-1 when required. A successful completion of this test will ensure the required equipment receives the signal directing the action required by this interlock at a SETPOINT within the requirements of Table 3.8.12-1.

The 1-Year surveillance frequency is considered adequate to track and trend the instrument performance and is based on equipment reliability.

Failure to meet or perform this SR requires declaring the affected interlock inoperable and entering Condition A of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)	4.8.12.3	Conductivity probes are verified to be set at or below the value stated in Table 3.8.12-1 every 10 Years. Performance of this SR verifies proper probe elevation. The surveillance frequency of 10 Years is based on engineering judgment. Failure to meet or perform this SR requires declaring the affected conductivity probe inoperable and entering Condition A of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.13 Waste Tank Purge Portable Ventilation Equipment

BASES

BACKGROUND SUMMARY

The radioactive aqueous caustic wastes received and stored in waste storage tanks continuously produce hydrogen due to the radiolysis of the contained water. Additionally during waste tank chemical cleaning, radioactive aqueous acidic wastes may produce hydrogen due to the corrosion of carbon steel components. Wastes may also contain trace amounts of organic compounds and ammonia. In addition, Tank 50 potentially contains the organic Isopar® L. The waste storage tanks are equipped with installed forced ventilation systems that purge the tank bulk vapor space to remove accumulated and evolving flammable vapors.

If the waste tank bulk vapor space forced ventilation system function for a waste storage tank is lost or unavailable for any reason, the flammable vapors being generated by the waste stored within the tank can start to accumulate in the tank bulk vapor space. If allowed to accumulate unchecked, the waste tank bulk vapor space may reach flammable conditions and deflagrate. Proper ventilation system operation prevents or minimizes buildup of flammable vapors in the tank bulk vapor space by providing a forced purge flow.

If the normal ventilation system is inoperable on a waste tank, Portable Ventilation Units can be placed in service to provide emergency exhaust flow to prevent the buildup of flammable vapors. The units are portable and may be hand-carried to the top of a tank in the event that the normal ventilation system fails and cannot be restored within the necessary time requirements. The Portable Ventilation Units are self-contained and do not rely on any site or FACILITY utilities to accomplish the intended function.

The Waste Tank Purge Portable Ventilation Equipment is stored in a designated seismically qualified structure. The equipment includes a blower assembly that draws suction from the tank bulk vapor space, pulls the flow through a HEPA filter, and exhausts the gases to atmosphere. In addition to the blower assembly, each Portable Ventilation Unit consists of a generator to provide power, a riser connection to connect the duct to the tank riser, and a flexible duct section.

(continued)

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits forced ventilation on static waste storage tanks (excluding VERY SLOW GENERATION TANKS) with providing sufficient purge flow rate through the tank to maintain the tank's bulk vapor space below flammable conditions. Dedicated Portable Ventilation Units, in conjunction with the Flammability Control Program, ensure that forced ventilation capabilities will be available for use on waste tanks following a seismic event (Ref. 1).

Waste Tank Purge Portable Ventilation Equipment is credited in the following accidents in the safety analysis: Waste Tank Explosion and Seismic Event (Ref. 1).

LCO

This LCO requires the Waste Tank Purge Portable Ventilation Equipment stated in Table 3.8.13-1 to be OPERABLE for the number of Portable Ventilation Units stated in the ERD (Ref. 2).

The number of dedicated Portable Ventilation Units shall be equal to the number of waste tanks that may become flammable within 24 hours after the seismic event plus a sufficient number to ensure that the balance of the waste tanks do not become flammable within 7 days following the seismic event. The number of additional ventilation units (to ensure flammable conditions are not reached in 7 days) shall be based on the following criteria:

- One additional unit is required when less than or equal to 7 waste tanks can become flammable in less than 7 days following a seismic event
- Two additional units are required when greater than 7 waste tanks can become flammable in less than 7 days following a seismic event

Because changes in waste tank conditions and planned operations may occur, the post-seismic time to flammability of waste tanks (and resulting number of required Portable Ventilation Units) may change. Therefore, instead of stating the required number of units directly in this LCO, reference is made to the ERD (Ref. 2). The ERD will be programmatically controlled and will reflect the number of dedicated Portable Ventilation Units required.

(continued)

LCO (continued)	For a Portable Ventilation Unit to be considered OPERABLE, it must have the equipment necessary for operation as stated in Table 3.8.13-1 and the equipment must be stored in the designated storage location. The Waste Tank Purge Portable Ventilation Equipment shall be properly stored such that it is available following a seismic event. The blower assembly does not have a specific credited flowrate. Based on engineering judgment, the nominal flow capacities of portable blowers are significantly greater than the required flow for a RAPID GENERATION TANK and will provide adequate flow.
MODE APPLICABILITY	This LCO is applicable whenever the waste storage tank is in normal waste-storage service, is undergoing waste removal, or is allowed to receive waste. Because waste storage tanks may be in normal waste-storage service, undergo waste removal, or be allowed to receive waste in all MODES except REMOVED FROM SERVICE and MECHANICAL CLEANING MODES, this LCO is applicable in GAS RELEASE, OPERATION, and CHEMICAL CLEANING MODES.
PROCESS AREA APPLICABILITY	This LCO is applicable to all waste storage tanks except for Tank 48. Portable ventilation equipment (EPVEs) for Tank 48 is addressed by LCO 3.2.2.
ACTIONS	A.1 Restoring compliance with this LCO within 14 Days limits the period during which the Portable Ventilation Units are allowed to be in a degraded condition. The 14-Day Completion Time is based on engineering judgment and operating experience and provides sufficient time to perform necessary repairs to the units. The Completion Time limits the period over which the number of OPERABLE Portable Ventilation Units may be less than the required number. Since the units are only required following a seismic event, the risk associated with this is judged to be acceptable in view of the frequency associated with the event.

(continued)

ACTIONS (continued)

Condition A shall not be entered solely due to the removal of Waste Tank Purge Portable Ventilation Equipment components from the storage location to perform SR 4.8.13.1. This 90-Day surveillance is performed in the immediate vicinity of the storage building and the risk associated with this activity is judged to be acceptable in view of the frequency associated with a seismic event.

SURVEILLANCE REQUIREMENTS

4.8.13.1 Verifying that each portable ventilation blower assembly and generator can be started every 90 Days ensures that the Portable Ventilation Unit is capable of performing an air sweep in the tank's vapor space to prevent the buildup of flammable vapors.

The surveillance frequency of 90 Days is based on engineering judgment and is considered adequate to ensure the OPERABILITY of the equipment.

Failure to meet or perform this SR requires declaring the affected Portable Ventilation Unit inoperable and entering Condition A of this LCO if the number of OPERABLE Portable Ventilation Units is less than the required number stated in the ERD (Ref. 2).

4.8.13.2 Performing a visual inspection of the Waste Tank Purge Portable Ventilation Equipment required components stated in Table 3.8.13-1 every 90 Days ensures that the required equipment is in the designated storage location and stored correctly to ensure availability following a seismic event. The inspection also ensures that the components do not have significant physical damage (i.e., damage that would preclude the component from performing its intended safety function).

The surveillance frequency of 90 Days is based on engineering judgment and is considered adequate to ensure the OPERABILITY of the equipment.

Failure to meet or perform this SR requires declaring the affected Portable Ventilation Unit inoperable and entering Condition A of this LCO if the number of OPERABLE Portable Ventilation Units is less than the required number stated in the ERD (Ref. 2).

(continued)

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. High Level Waste Emergency Response Data and Waste Tank Data. N-ESR-G-00001, Washington Savannah River Company, Aiken, SC.

B3/4.8 WASTE STORAGE TANKS (Excluding Tank 48)

B3.8.14 Tank 50 Waste Temperature Monitoring

BASES

BACKGROUND SUMMARY	The radioactive aqueous caustic wastes received and stored in Tank 50 potentially contain Isopar® L from the MCU process. Isopar® L is the dominant organic constituent in the MCU solvent and is potentially the major contributor to flammable vapor in Tank 50. The contribution to CLFL of Isopar® L is temperature dependent. Maintaining the average bulk waste temperature in Tank 50 will ensure that equilibrium Isopar® L and trace organics are maintained within initial conditions (<60%) for the contribution to the Tank 50 steady state CLFL. Because temperature will be protected, Reference 1 states that this temperature may be utilized for all flammability calculations (e.g., trace organics) for Tank 50. Use of this temperature limit for the flammability calculations is only applicable to Tank 50 since its effluent is only transferred to the Saltstone Facility (i.e., it is not introduced into the CSTF evaporator system). The Tank 50 waste temperature monitoring loop includes a temperature element (thermocouple), installed in a thermowell submerged in the waste, and a local temperature indicator. The waste temperature monitoring loop provides an indication of average bulk waste temperature to the operator.
APPLICATION TO SAFETY ANALYSIS	The safety analysis credits periodic temperature monitoring on Tank 50. Isopar® L vapor concentration in the waste tank vapor space increases with increased waste temperature. A waste temperature monitoring loop is credited to provide indication of average bulk waste temperature. Following detection of a high tank waste temperature, operators will take actions to stop activities that have the potential of increasing the waste temperature such that temperature can be restored within limits (Ref. 1). Tank 50 Waste Temperature Monitoring is credited in the following accidents in the safety analysis: Waste Tank Explosion (Ref. 1).
LCO	This LCO requires that the Tank 50 average bulk waste temperature to be less than or equal to 39°C. This LCO also requires the Tank 50 waste temperature monitoring components stated in Table 3.8.14-1 be OPERABLE.

(continued)

LCO (continued)

An OPERABLE waste temperature monitoring instrument shall be capable of detecting an increase in Tank 50 average bulk waste temperature and provide local indication to alert operators to the condition. To ensure an accurate average bulk waste temperature indication, the elevation of the temperature element shall be below the waste level in the tank.

The LCO value of 39°C is based on the average bulk waste temperature value of 43°C adjusted for total instrument uncertainty (Ref. 2).

MODE APPLICABILITY

The Tank 50 gas release criteria does not permit Tank 50 to enter GAS RELEASE MODE and as such, this LCO is not applicable in GAS RELEASE MODE. This LCO is applicable whenever Tank 50 is in normal waste-storage service or is allowed to receive waste. Because Tank 50 may be in normal waste-storage service or be allowed to receive waste in all MODES except REMOVED FROM SERVICE MODE and GAS RELEASE MODE, this LCO is applicable in OPERATION MODE.

PROCESS AREA APPLICABILITY

This LCO is applicable to Tank 50. Tank 50 is the only waste tank that requires temperature monitoring of the bulk waste to protect flammable vapor assumptions within the safety analysis (Ref. 1).

ACTIONS

A.1

The Note preceding Required Action A.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action A.1.

Stopping transfers, except for CONTINGENCY TRANSFERS, into and out of Tank 50 IMMEDIATELY ensures that additional hydrogen-generating waste or waste containing Isopar® L is not added to the tank while the tank average bulk waste temperature is higher than its allowed value. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space and the waste temperature will not increase further due to the effect of the jet heating the transferred waste. Stopping transfers out of the waste tank stops heat addition due to the effect of the transfer pump and transfer pump recirculation line heating the waste. Stopping transfers also limits the reduction of the available tank vapor space volume.

(continued)

ACTIONS (continued)

The following are not considered transfers into Tank 50 for compliance with this Required Action: CONTINGENCY TRANSFERS, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying Tank 50 annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

A.2

Stopping Tank 50 mixing devices IMMEDIATELY ensures that the tank mixing devices do not contribute to the heating of the bulk waste in the tank.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

A.3

Securing steam to the annulus ventilation system on Tank 50 within 12 Hours ensures that the annulus ventilation does not contribute to the heating of the bulk waste in the tank and allows the annulus ventilation system to provide a cooling effect to the tank wall.

The Completion Time of 12 Hours allows time to isolate the annulus pre-heater coils to the tank.

(continued)

ACTIONS (continued)

A.4

Ensuring forced ventilation is operating on Tank 50 within 24 Hours limits the period within which flammable vapors can accumulate in the tank bulk vapor space. Forced ventilation can be provided by the installed fan, or by portable equipment attached to either the purge exhaust stack or directly to a tank riser. Ensuring forced ventilation is operating on Tank 50 maintains the hydrogen contribution to Tank 50 CLFL at a minimum value and ensures ambient air purges the tank bulk vapor space to allow atmospheric air to cool the waste. The flow rate of the forced ventilation shall meet the minimum flow requirement of 72 scfm for RAPID GENERATION TANKS. Verification that the minimum flow requirement is met may be based on the rated capacity of the fan or portable blower and the system alignment and requires neither initial nor subsequent periodic measurement of flow.

After forced ventilation is initiated, it should be operated to the maximum extent possible until compliance with this LCO is restored. Acceptable reasons to secure forced ventilation for limited periods include, but are not limited to, mechanical failures, interruption of electrical power, refueling of engine/generator, and alarm response.

The initial Completion Time of 24 Hours ensures that forced ventilation is provided to Tank 50 to minimize flammable vapor accumulation. Repeating this Required Action every 12 Hours ensures that a subsequent loss of ventilation is discovered and actions will be taken in a timely manner.

A.5

Reducing the average bulk waste temperature in Tank 50 to less than or equal to the maximum allowable value within 7 Days restores compliance with this LCO. The Completion Time of 7 Days is based on a reasonable time to isolate heat producing sources and provide cooling to the bulk waste.

The Completion Time of 7 Days is considered acceptable based on compensatory measures of Required Actions A.1 through A.4 that remove the heat loads and allow the tank waste to cool.

(continued)

ACTIONS (continued)

B.1

The Note preceding Required Action B.1 states that liquid additions needed to place the waste tank in a safe condition (e.g., flushing of level monitoring components) are not prevented by Required Action B.1.

Stopping transfers, except for CONTINGENCY TRANSFERS, into and out of Tank 50 IMMEDIATELY ensures that additional hydrogen-generating waste or waste containing Isopar® L is not added to the tank while the tank waste temperature monitoring system is in a degraded condition. Stopping transfers also limits the reduction of the available tank vapor space volume. It also ensures that in the case of a jet transfer into the waste tank, additional dissolved hydrogen is not released into the receipt tank vapor space and the waste temperature will not increase further due to the effect of the jet heating the transferred waste.

The following are not considered transfers into Tank 50 for compliance with this Required Action: CONTINGENCY TRANSFERS, flow from siphon break on transfer pump / jet discharge, and drain-backs following termination of a transfer.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

Allowing CONTINGENCY TRANSFERS to continue or start is intended to ensure that transfers necessary to support emptying Tank 50 annulus are not prohibited. CONTINGENCY TRANSFERS do not reduce waste tank vapor space volume and have minimal impact on additional hydrogen release from the waste.

The limited liquid additions allowed by this Required Action (e.g., flushes needed to support ventilation or level monitoring equipment) are typically of small volumes (e.g., several hundred gallons). Although introduction of this liquid to the waste tank will cause a minor increase in tank level (approximately 0.3 inches for a 1000-gallon liquid addition into a 372-inch tall Type IIIA tank), the increase in risk associated with these small additions is considered acceptable considering the potential benefits achieved by the additions (e.g., restoring ability to transfer liquid out of the tank, restoring normal ventilation on the tank, restoring ability to monitor liquid level).

(continued)

ACTIONS (continued)

B.2

Stopping Tank 50 mixing devices IMMEDIATELY ensures that the tank mixing devices do not contribute to the heating of the bulk waste in the tank while the tank waste temperature monitoring system is in a degraded condition.

The Completion Time of IMMEDIATELY ensures that a sufficiently high priority is placed on completion of this Required Action.

B.3

Securing steam to the annulus ventilation system on Tank 50 within 12 Hours ensures that the annulus ventilation does not contribute to the heating of the bulk waste in the waste tank while the tank waste temperature monitoring system is in a degraded condition.

The Completion Time of 12 Hours allows time to isolate the annulus pre-heater coils to the tank.

B.4

The Note preceding Required Action B.4 states that if Tank 50 average bulk waste temperature has been verified within the 2 Hours preceding entry into this Condition, then the requirement of Required Action B.4 (to verify tank average bulk waste temperature less than or equal to the maximum limit within 24 Hours) may be considered met by the previous measurement.

Verifying that the average bulk waste temperature is less than or equal to the maximum temperature limit within 24 Hours and every 24 Hours thereafter ensures that an increase in tank average bulk waste temperature above the maximum limit will be detected in a timely manner. A periodic check of tank average bulk waste temperature is considered adequate because actions have been completed to stop transfers into the tank and mixing devices which are the most likely causes of tank waste temperature increases.

If this Required Action is not met or the Completion Times are not met, Condition A of this LCO is entered also (Condition B remains applicable).

B.5

Restoring the waste temperature monitoring loop to OPERABLE status within 30 Days restores compliance with the LCO statements.

(continued)

ACTIONS (continued)

The 30-Day Completion Time is based on engineering judgment and operating experience and provides sufficient time to perform necessary repairs to the system. The Completion Time limits the period over which the waste tank's temperature instrumentation is allowed to be in a degraded condition.

SURVEILLANCE REQUIREMENTS

4.8.14.1 Verifying Tank 50 average bulk waste temperature is less than or equal to 39°C every 24 Hours ensures that tank average bulk waste temperature is monitored and appropriate action is taken when above established limits.

The frequency of 24 Hours is based on operating experience and engineering judgment, including consideration of the time required to heat the bulk contents of a waste tank. The frequency determination also considered that the minimum allowed time to reach CLFL in Tank 50 following loss of ventilation is 7 days (when tank average bulk waste temperature is at the limit).

Failure to meet or perform this SR requires assuming that the tank average bulk waste temperature is outside of its limits and entering Condition A of this LCO.

4.8.14.2 Performance of an INSTRUMENT LOOP CHECK on the installed waste temperature monitoring loop stated in Table 3.8.14-1 every 90 Days ensures that a gross failure of the instrument has not occurred.

The frequency of 90 Days is based on engineering judgment.

Failure to meet or perform this SR requires declaring the waste temperature monitoring loop inoperable and entering Condition B of this LCO.

4.8.14.3 An INSTRUMENT LOOP CALIBRATION shall be performed every 1 Year on the required waste temperature monitoring loop stated in Table 3.8.14-1. Performance of this SR ensures that the instrumentation that senses average bulk waste temperature is maintained in a sufficiently accurate condition.

The frequency of 1 Year is consistent with the uncertainty analysis for this instrument (Ref. 2).

(continued)

SURVEILLANCE REQUIREMENTS (continued)	Failure to meet or perform this SR requires declaring the waste temperature monitoring loop inoperable and entering Condition B of this LCO.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Instrumentation Uncertainties Evaluation, Tank 50 Temperature Monitoring: HI-241-950-WTE-TE-2209F-A&B. J-CLC-H-00895, Washington Savannah River Company, Aiken SC, September 2006.

B3/4.9 ELECTRICAL POWER

B3.9.1 Standby Electrical Power

BASES

BACKGROUND SUMMARY

A loss of offsite power has the potential to affect multiple PROCESS AREAS and can affect a wide array of equipment. The 254-13H Diesel Generator provides a backup power supply to the HDB-8 Complex PVV System Fans on a loss of the normal power supply. The 254-13H Diesel Generator is required to automatically start and supply electrical power to the PVV fans when a loss of normal power to HDB-8 electrical system is detected.

APPLICATION TO SAFETY ANALYSIS

The safety analysis credits backup power to the ventilation system at HDB-8. Backup power is credited to ensure the HDB-8 ventilation system is powered following a loss of normal power.

The 254-13H diesel generator is credited in the following accidents in the safety analysis: Pump Pit and Pump Tank Explosion, Aerosolization Events, Seismic Event, and Loss of Offsite Power (Ref. 1).

LCO

The 254-13H diesel generator shall be OPERABLE to ensure that the HDB-8 PVV System will be able to be supplied with the necessary backup power during a loss of normal sources of electrical power. To be considered OPERABLE, the diesel generator shall be aligned and capable to start automatically on a loss of normal power, and capable of accepting the safety related loads. The diesel generator fuel oil storage tank shall be at least three-quarters full to support operations of the diesel. When the diesel generator is operating, the diesel generator shall not be considered inoperable based solely on fuel oil storage tank level being less than three-quarters full. Considering the diesel generator OPERABLE in this case is considered adequate since SR 4.9.1.4 verifies that the fuel oil storage tank level is restored after shutdown, which limits the duration.

MODE APPLICABILITY

Requiring the 254-13H diesel generator to be OPERABLE ensures that the HDB-8 PVV System will have electrical power available to ventilate the HDB-8 Complex pump tanks. This LCO applies to pump tanks when the tanks are allowed to contain significant quantities of radioactive waste and when WASTE TRANSFERS into or through pump tanks are allowed. Therefore, this LCO applies to pump tanks in OPERATION and STANDBY MODES.

(continued)

PROCESS AREA APPLICABILITY

The HDB-8 PVV System is required to support the HDB-8 Complex pump tanks. The 254-13H diesel generator included in this LCO is support equipment for the HDB-8 PVV System. Therefore, this LCO is applicable to the HDB-8 Complex pump tanks (i.e., HPT-7, HPT-8, HPT-9, and HPT-10).

ACTIONS

A.1

Required Action A.1 requires the diesel generator to be restored to OPERABLE status within 7 Days. The Completion Time of 7 Days is based on engineering judgment and the failure frequency for loss of AC power to the site.

A.2.1

If the diesel generator or support equipment cannot be returned to OPERABLE status per Required Action A.1, a portable generator of sufficient capacity to supply the required electrical loads may be relied upon for backup power. The portable generator must be available to supply backup power within the same 7-Day Completion Time as specified for Required Action A.1. Procedures must be available to ensure that the portable generator will be started and loaded when required. The applicable SRs must be performed to verify OPERABILITY of the portable generator.

A.2.2

Concurrent with steps taken to make a portable diesel generator available, actions to restore the permanent diesel generator (or support equipment) shall be pursued, and completed within the 60-Day Completion Time. Reliance upon a portable generator is limited to 60 Days to ensure that the diesel generator (or support equipment) is restored to OPERABLE status in a timely fashion. The 60-Day Completion Time is based on historical repair time precedence, lessons learned, site databank information, and engineering judgment.

(continued)

SURVEILLANCE REQUIREMENTS

4.9.1.1 The starting battery on the 254-13H diesel generator shall be checked every 30 Days to ensure that the battery is charged and capable of starting the generator on demand. Inspections shall include verification of proper voltage, proper cell electrolyte level, and specific gravity of all cells (Ref. 2). The surveillance frequency is based on the low consequences associated with a loss of power and upon established practices. Failure to meet or perform this SR requires entering Condition A of this LCO.

4.9.1.2 This SR demonstrates that the 254-13H diesel generator automatically starts from standby conditions and attains the required voltage and frequency in accordance with guidance provided in Reference 2. After achieving the required voltage and frequency, the diesel generator must supply at least 25% of the rated capacity for 30 minutes, followed by 50% rated capacity for 30 minutes, followed by 75% rated capacity for 60 minutes, for a total of 2 continuous hours (Ref. 2). Credit can be taken for successful unplanned starts of the diesel generator in satisfying this 1-Year SR, provided the preceding minimum load and duration requirements are met. Failure to meet or perform this SR requires entering Condition A of this LCO.

The 1-Year surveillance frequency is based on operating experience and engineering judgment and is considered adequate to trend equipment performance.

4.9.1.3 The automatic transfer switch shall be operated every 1 Year. The test shall consist of electrically operating the transfer switch from the standard position to the alternate position and then returning the switch to the standard position. Failure to meet or perform this SR requires entering Condition A of this LCO.

The 1-Year surveillance frequency is based on operating experience and engineering judgment and is considered adequate to trend equipment performance.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.9.1.4 The fuel oil level for the 254-13H diesel generator shall be checked within 24 Hours after each diesel engine shutdown to ensure that the fuel tank is at least three-quarters full with fuel oil. Failure to meet or perform this SR requires entering Condition A of this LCO.

If a portable generator is being relied upon in accordance with Required Action A.2.1, similar availability of fuel for the portable generator must be verified.

4.9.1.5 Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment to survive. Bottom sediments can cause fouling of the fuel oil system and degrade engine performance. Removal of water from the storage tank once every 30 Days eliminates the necessary environment for bacteria. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during diesel generator operation. Water may come from any of several sources including condensation, ground water, rainwater, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The presence of water does not necessarily represent a failure of the SR, provided all but trace amounts of the accumulated water are removed during performance of this surveillance. This SR is for preventive maintenance.

The 30-Day surveillance frequency is based on Reference 3. Failure to meet or perform this SR requires entering Condition A of this LCO.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

4.9.1.6 Fuel oil degradation during long-term storage shows up as an increase in particulates, due mostly to oxidation. The presence of particulates does not mean the fuel oil will not burn properly in a diesel engine. However, the particulates can cause fouling of filters and fuel oil injection equipment.

The diesel generator fuel oil tank shall be sampled for particulate contamination every 90 Days. Particulate content of a tank representative sample of fuel oil shall not exceed 20 mg/L. If the fuel oil particulate content exceeds 20 mg/L, the fuel shall be declared unusable for the diesel generator.

The frequency of this SR is based on the recommendations documented in Reference 3 and takes into consideration fuel oil degradation trends that indicate particulate concentration is unlikely to change significantly within the surveillance interval.

Failure to meet or perform this SR requires entering Condition A of this LCO.

4.9.1.7 The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have a detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tank without concern for contaminating the entire volume of fuel oil in the storage tank. These tests are to be conducted prior to adding the new fuel oil to the storage tank. The tests, limits, and applicable American Society for Testing and Materials (ASTM) standards are as follows:

a. Sample the new fuel oil in accordance with ASTM D 4057 (Ref. 4).

b. Verify in accordance with the tests specified in References 3 and 5 that the sample has an API gravity of $\geq$ 30 and $\leq$ 38, kinematic viscosity of $\geq$ 1.9 and $\leq$ 4.1 centistokes at 40°C, sediment and water is $\leq$ 0.05% by volume, flash point of $\geq$ 125°F, and visual appearance is clear and bright.

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SURVEILLANCE REQUIREMENTS (continued)

Failure to meet any of the above limits is cause for rejecting the new fuel, but does not represent a failure to meet the SR, as long as the fuel oil is not added to the storage tank. Failure to meet or perform this SR requires entering Condition A of this LCO.

4.9.1.8 Within 30 Days following the initial fuel oil sample, the fuel oil is analyzed to verify the following properties in accordance with ASTM D 975: the cloud point is $\leq$ 23°F, the cetane number is $\geq$ 40 (Ref. 5), and the particulate contamination is $\leq$ 10 mg/L (Ref. 3). The 30-Day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on diesel generator operation. This SR ensures the availability of high-quality fuel oil for the diesel generator. Failure to meet or perform this SR requires entering Condition A of this LCO.

4.9.1.9 This SR demonstrates that the 254-13H diesel generator automatically starts from standby conditions and attains the required voltage and frequency specified in Reference 2. This test is performed in accordance with guidance provided in References 6 and 7. Credit can be taken for successful unplanned starts of the diesel generator in satisfying this 90-Day SR. Failure to meet or perform this SR requires entering Condition A of this LCO.

The 90-Day surveillance frequency is based on operating experience and engineering judgment and is considered adequate to trend equipment performance.

REFERENCES

1. Concentration, Storage, and Transfer Facilities Documented Safety Analysis. WSRC-SA-2002-00007, Washington Savannah River Company, Aiken, SC.

2. Standard for Emergency and Standby Power Systems. NFPA 110, 2002 Edition.

3. Savannah River Site Requirements for Diesel Fuel Quality. 15591-01-R, Rev. 0, January 1994.

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REFERENCES (continued)

4. Standard Practice for Manual Sampling of Petroleum and Petroleum Products. ASTM D 4057-95, November 1995.

5. Standard Specification for Diesel Fuel Oils. ASTM D 975-05, June 2005.

6. Backup Power Sources for DOE Facilities. DOE-STD-3003-2000, January 2000.

7. IEEE Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations. IEEE Std 387-1995, Section 4.2.2, December 1995.