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Review of Nuclear Criticality Safety Requirements Implementation for Hanford Tank Farms Facility

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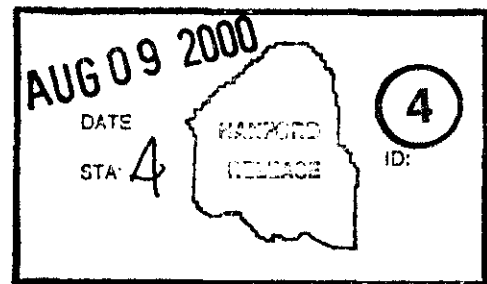
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Abstract: In November 1999, the Deputy Secretary of the Department of Energy directed a series of actions to strengthen the Department's ongoing nuclear criticality safety programs. A Review Plan describing lines of inquiry for assessing contractor programs was included. The Office of River Protection completed their assessment of the Tank Farm Contractor program in May 2000. This document supports that assessment by providing a compliance statement for each line of inquiry.

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REVIEW OF NUCLEAR CRITICALITY SAFETY REQUIREMENTS IMPLEMENTATION FOR HANFORD TANK FARMS FACILITY

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EXECUTIVE SUMMARY

In November 1999, the Deputy Secretary of the Department of Energy (DOE) directed a series of actions to strengthen the Department's ongoing nuclear criticality safety (NCS) programs, including assessment of contractor NCS programs. A Review Plan describing lines of inquiry (LOI) for assessing contractor programs was attached. The Office of River Protection completed their assessment of the Tank Farm Contractor program in May 2000. This document supports that assessment by providing a compliance statement for each LOI that identifies applicable contractor procedures and documents for the Hanford Tank Farms facility.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

1.0	INTRODUCTION	5
1.1	PURPOSE.....	5
1.2	BACKGROUND	5
1.3	ROLES AND RESPONSIBILITIES.....	6
1.4	ASSESSMENT ELEMENT CROSSWALK DESCRIPTION	6
2.0	CROSSWALK OF ASSESSMENT ELEMENTS VERSUS COMPLIANCE STATEMENTS.....	8
3.0	REFERENCES	46

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1.0 INTRODUCTION

1.1 Purpose

In November 1999, the Deputy Secretary of the Department of Energy (DOE) directed a series of actions to strengthen the Department's ongoing nuclear criticality safety (NCS) programs, including assessment of contractor NCS programs. A Review Plan describing lines of inquiry (LOI) for assessing contractor programs was attached. The Office of River Protection completed their assessment of the Tank Farm Contractor program in May 2000. This document supports that assessment by providing a compliance statement for each LOI that identifies applicable contractor procedures and documents for the Hanford Tank Farms facility.

1.2 Background

CH2M Hill Hanford Group, Inc. (CHG) manages the River Protection Project for the DOE Office of River Protection. The Tank Farms nuclear criticality safety program applies to activities associated with the safe receipt, transfer and storage of waste in the Tank Farms facility. Specifically, the program applies to fissionable materials contained in waste stored in:

- High-level waste (HLW) storage tanks and ancillary equipment,
- Double-contained receiver tanks (DCRTs) and ancillary equipment,
- Miscellaneous inactive storage tanks and equipment (MISFs,
- Ponds, cribs, and ditches.

The current Tank Farms facility mission is to continue to safely store remaining tank waste and to conduct waste retrieval and disposal activities in support of the long-term goal for the complete removal and final disposition of the tank waste. Activities are performed at Tank Farms in a manner that complies with environmental regulations and minimizes public and worker risk.

Collectively, the DSTs and SSTs contain an estimated 500 to 1,000 kg (1,100 to 2,200 lb) of plutonium. Analyses of tank waste samples show that the plutonium content of the waste is primarily associated with the sludge phase. WHC-SD-WM-TI-725, *Tank Farm Nuclear Criticality Review*, established that fissionable material in the waste tanks is distributed at subcritical concentrations with excess neutron absorbers present, and that no mechanisms exist to concentrate the fissile material to result in an accidental nuclear criticality. Related accident analyses are documented in HNF-SD-WM-SAR-067, *Tank Waste Remediation System Final Safety Analysis Report* (FSAR). Section 6.3.2 of the FSAR states that a criticality accident in the Tank Farms is not credible for operations discussed in that document, and that the facility is classified for the purposes of nuclear criticality safety as a Limited Control Facility. The Tank Farms criticality safety program, therefore, consists primarily of administrative controls designed to protect against altering the waste inventory in a way that could increase the probability of a criticality accident. Controls for the program are discussed in HNF-SD-WM-TSR-006, *Tank Waste Remediation System Technical Safety Requirements, Administrative Control 5.7, "Nuclear*

Criticality Safety.” The program is described in HNF-IP-1266, *Tank Farms Operations Administrative Controls*, Chapter 5.7, “Nuclear Criticality Safety.”

1.3 Roles and Responsibilities

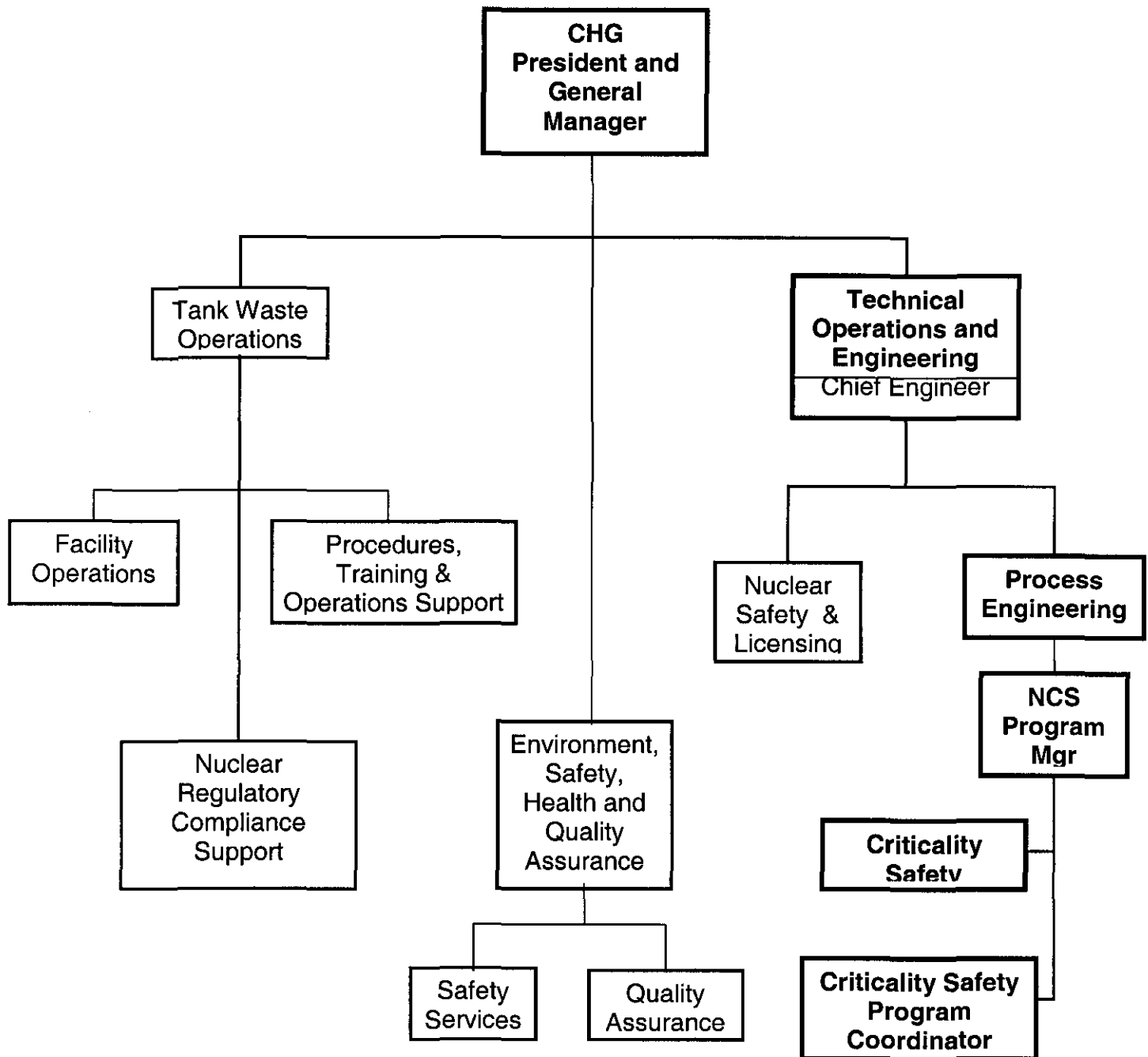
The criticality safety program at Tank Farms is focused on maintaining the facility status as a Limited Control Facility. Organizationally, the program manager and Criticality Safety Representative (CSR) report to the facility manager from within the engineering function. The CSR is roughly equivalent to a Criticality Safety Officer as called out in some DOE documents. The functional organization chart is shown in Figure 1 below.

1.4 Assessment Element Crosswalk Description

A detailed crosswalk of requirements, assessment elements, implementing documents and compliance statements for each is shown in Table 1 later in this document. The table is organized to show:

- Item – a sequential number for ease of reference
- Requirement / Query -- each individual requirement is stated, followed by lines of inquiry (assessment elements or criteria) in the same column. This information is copied from Attachment 3 to the November 1999 Glauthier memorandum (Glauthier).
- Implementing Document – the document number, and in most cases, the section in the Tank Farms Contractor procedural document which implements a particular requirement or provides the background information is identified.
- Compliance Statement – additional text describing the way in which Tank Farms complies with a requirement or a reason why the requirement is not applicable, and
- Corrective Action – in this column, any corrective action that the Department or the Contractor is taking to upgrade compliance for a particular element is described.

Figure 1. Tank Farms Nuclear Criticality Safety Program
Functional Organization



Update: 4/24/2000

2.0 Crosswalk of Assessment Elements versus Compliance Statements

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
1.0	MANAGEMENT RESPONSIBILITIES			
1.1	ANS-8.19 Sec. 4.1.(1) Management Responsibilities. Management shall accept overall responsibility for safety of operations.	RPP-POL-CRIT-SAF		
	ANS-8.19 Sec. 4.1.(2) Management Responsibilities. Continuing interest in safety shall be evident.	HNF-IP-1266 Ch. 5.7		
1.1.1	Does Contractor Facility Management demonstrate continuing interest in criticality safety as evidenced by conducting safety meetings, issuing safety bulletins, inspecting facilities on a regular basis, and ensuring continuous improvement in safety?	HNF-IP-1266 Ch. 5.7	Yes. Facility inspections are conducted on a semi-annual basis, and NCS is included as a topic in safety meetings on a periodic basis.	
1.1.2	Does the Contractor Facility Management demonstrate continuing interest in criticality safety as evidenced by regular meetings with the criticality safety engineers and the Nuclear Criticality Safety (NCS) manager?	HNF-IP-1266 Ch. 5.7	Yes. NCS program manager keeps senior mgmt informed of developments in NCS program during scheduled status sessions.	
1.1.3	Does the Contractor Program Management regularly meet with the NCS manager?	HNF-IP-1266 Ch. 5.7	Yes. NCS program coordinator meets regularly with DOE program coordinator to discuss items of mutual interest in the NCS program.	
1.2	ANS-8.19 Sec. 4.2 Management Responsibilities. Management shall formulate nuclear criticality safety policy and make it known to all employees involved in operations with fissile material.	RPP-POL-CRIT-SAF HNF-IP-1266 Ch. 5.7		
1.2.1	Does the Contractor have a written criticality safety policy?	RPP-POL-CRIT-SAF	Yes, title is: RPP-POL-CRIT-SAF	
1.2.2	Are all fissile material handlers and their supervisors familiar with the criticality safety policy?	RPP-POL-CRIT-SAF	Tank Farms has no fissile materials handlers. However, those operations personnel and supervisors who control waste transfers are trained in NCS concepts.	
1.2.3	How is compliance to the Contractor criticality safety policy required of all program personnel performing work?	RPP-POL-PROCEDURE	Verbatim compliance with procedures and policies is required of all personnel.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
1.3	ANS-8.19 Sec. 4.3.(1) Management Responsibilities. Management shall assign responsibility and delegate commensurate authority to implement established policy.	RPP-POL-CRIT-SAF HNF-IP-1266 Ch. 5.7		
	ANS-8.19 Sec. 4.3.(2) Management Responsibilities. Responsibility for nuclear criticality safety <u>shall</u> be assigned in a manner compatible with that for other safety disciplines.	HNF-IP-1266 Ch. 5.7		
1.3.1	Are the roles and responsibilities of the Criticality Safety Engineers (CSEs) documented?	HNF-IP-1266 Ch. 5.7	Yes, the role and responsibilities of CSE are documented in the NCS program description (HNF-IP-1266 Ch. 5.7).	
1.3.2	Are the roles and responsibilities of the NCS Manager and Organization documented?	HNF-IP-1266 Ch. 5.7	Yes, the roles and responsibilities of the NCS program manager, criticality safety representative (CSR) and CSE are documented in the NCS program description.	
1.3.3	Are the roles and responsibilities of the Criticality Safety Officer (CSO) documented, if applicable?	HNF-IP-1266 Ch. 5.7	Yes, Hanford uses the term criticality safety representative (CSR). The role and responsibilities of the CSR are documented in the NCS program description.	
1.3.4	Is there are a clear distinction between the roles of the CSO and the CSE?	HNF-IP-1266 Ch. 5.7	Yes. The procedures governing NCS-related activities clearly distinguish between the CSR and CSE.	
1.3.5	Is line management assigned responsibility for criticality safety?	HNF-IP-1266 Ch. 5.7, RPP-POL-CRIT-SAF	Yes. The policy and procedures which implement NCS requirements clearly assign responsibility for NCS to line management.	
1.3.6	Has the Contractor assigned responsibility for oversight of the NCS program?	RPP-POL-CRIT-SAF	Yes. This responsibility is assigned to the NCS program manager, who oversees line management via scheduled inspections and assessments.	
1.4	ANS-8.19 Sec. 4.4.(1) Management Responsibilities. Management shall provide personnel familiar with the physics of nuclear criticality and with associated safety practices to furnish guidance appropriate to the scope of operations.	HNF-IP-1266 Ch. 5.7		
	ANS-8.19 Sec. 4.4.(2) Management Responsibilities. This function <u>shall</u> , to the extent practicable, be administratively independent of operations.	HNF-IP-1266 Ch. 5.7		

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
1.4.1	Does the Contractor have sufficient funding to assure continuous support by NCS Staff?	RPP-POL-4467 (ISMS)	Yes. The program is funded as part of the base "minimum safe operation" budget, through the Multi-Year Program Plan. The budget provides adequate funding for the needed functions.	
1.4.2	Does the Contractor management provide discretionary funding to the NCS manager to provide training and professional development for the NCS, to address facility-wide issues, to maintain the NCS program documentation, and to ensure that criticality safety codes and platforms are verified and validated?	HNF-IP-1266 Ch. 5.7	Yes. The funding provided for the NCS program is targeted to provide adequate training (including off-site training for key staff), analysis and documentation appropriate for maintenance of limited control facility status. Also included is participation in the cross-cutting forum for NCS issues at Hanford (NCS Center of Excellence).	
1.4.3	Does the NCS Staff have unilateral, unscheduled access to the facility and operations personnel?	HNF-IP-0842, IV, 6.5	Yes. The CSR (or alternate) is able at any time to enter the facility in conjunction with operations staff.	
1.4.4	Does the Contractor issue requirements for the qualifications and training of NCS Staff, including subcontractors?	HNF-IP-1266 Ch. 5.7	Yes. The program description includes training and qualification requirements for NCS staff including subcontractors. The CSR/Alt CSR, CSE and program manager complete a formal qualification card process, plus the CSR/Alt CSR also must pass an oral board prior to appointment.	
1.4.5	Is the Contractor NCS Staff administratively independent of operations?	HNF-IP-1266 Ch. 5.7	Yes. The NCS program manager and staff report through the technical support management chain to the chief engineer.	
1.4.6	Do all members of the NCS Staff have technical degrees in physics or nuclear engineering?	HNF-IP-1266 Ch. 5.7	No. The required functions are fulfilled by a CSR, alternate CSR and program coordinator who are chemical engineers with extensive experience in nonreactor nuclear facilities. The CSE are nuclear engineers (this function is subcontracted). Given the nature of the facility and its limited control designation, this combination is considered appropriate.	
1.5	ANS-8.19 Sec 4.5 Management Responsibilities. Management shall establish a means for monitoring the nuclear criticality safety program.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.1		
1.5.1	Who is responsible for monitoring the criticality safety program?	HNF-IP-0842, IV, 6.1	This responsibility is assigned to the NCS program manager, who oversees line management via scheduled inspections and assessments.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
1.5.2	Are all deficiencies related to criticality safety entered in a corrective action tracking system?	HNF-IP-0842, II, 1.6.2	Yes. Significant deficiencies are entered into the formal facility-wide tracking system ("DTS") per internal requirements. Minor corrective actions are tracked in a departmental system.	
1.5.3	Are mechanisms in place to validate closure of all criticality safety related deficiencies?	HNF-IP-0842, II, 1.6.2	Yes. The formal facility-wide tracking system ("DTS") contains mechanisms to validate closure of all action items.	
1.5.4	Does line program management maintain awareness of criticality safety deficiencies through the use of a corrective action tracking system?	HNF-IP-0842, II, 4.6.2	Yes. Significant deficiencies are entered into the formal facility-wide tracking system ("DTS") per internal requirements. Minor corrective actions are tracked in a departmental system. Regular reviews focus on closure of these actions.	
1.5.5	Is there a program or procedure for trending deficiencies in the criticality safety program?	HNF-IP-0842, II, 4.6.2	Yes. All occurrences and nonconformances are documented via and occurrence report and tracked via formal tracking system. There have been no criticality nonconformances for the life of the tracking system (25 years).	
1.5.6	Does the Contractor perform assessments of compliance to operating procedures?	HNF-IP-0842, IV, 6.1	Yes. The program requires periodic facility inspections (semi-annually) and assessments (biennial).	
1.5.7	Does the Contractor assess implementation of conduct of operations?	HNF-IP-0842, XI, 1.4	Yes, this is accomplished within the ConOps program and independent assessments administered via the quality assurance function.	
1.5.8	How are NCS funding levels proposed and approved?	RPP-MP-015	The NCS program manager participates in development of the Multi-Year Program Plan.	
1.5.9	How does the Contractor management determine that funding for NCS is sufficient and is there a mechanism for adjusting the funding during the fiscal year?	RPP-MP-015	Historical data is analyzed and compared with planned activities to provide proposed funding levels. Once the funding is approved, formal baseline change control mechanisms are available for identification, prioritization and funding of emerging scope.	
1.6	ANS-8.19 Sec 4.6 Management Responsibilities. Management shall periodically participate in auditing the overall effectiveness of the nuclear criticality safety program.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.1		

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
1.6.1	Does the Contractor management participate in review teams or committees to assess facility criticality safety programs?	IP-0842, I, 2.10 HNF-IP-0842, IV, 6.1	Yes. First, via the Management Oversight Program (MOP), management performs regular focused assessments of specific operational areas. Second, Operations management participates via a field role or review of the plan for NCS inspections and assessments.	
1.6.2	Does the Contractor program management routinely audit operations for compliance to criticality safety requirements?	HNF-IP-0842, IV, 6.1	Yes. Facility inspections are conducted on a semi-annual basis.	
1.6.3	Does the Contractor facility management routinely audit operations for compliance to criticality safety requirements?	HNF-IP-0842, IV, 6.1	Yes. Facility inspections are conducted on a semi-annual basis. These inspections are conducted jointly by NCS program and Operations staff.	
1.6.4	Does the Contractor perform NCS management self-assessments of their criticality safety staff and program?	HNF-IP-0842, IV, 6.1	Program assessments are conducted on at least a biennial frequency. The program manager conducts management oversight (MOP), including staff performance assessment. Individual staff knowledge is verified via oral boards for qualification (for example: CSR/Alt CSR, shift manager, operating engineer).	
1.7	ANS-8.19 Sec 4.7 Management Responsibilities. Management may use consultants and nuclear criticality safety committees in achieving the objectives of the nuclear criticality safety program.			
1.7.1	Does management utilize a nuclear criticality safety committee to assist in monitoring and improving the criticality safety program?		No. For this Limited Control Facility, management did not consider an NCS committee appropriate.	
1.7.2	If nuclear criticality safety committees are used, do they report directly to the Senior management?		n/a	
1.7.3	Are the findings from the nuclear criticality safety committee, or equivalent, entered into a tracking database and corrective actions implemented?		n/a	
1.7.4	Are outside consultants utilized to provide an independent viewpoint on the overall criticality safety program?		Yes. External independent assessments are conducted in conjunction with management assessments as a prudent management action. The most recent one was conducted in March 2000.	
2.0	SUPERVISORY RESPONSIBILITIES			

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
2.1	ANS-8.19 Sec 5.1 Supervisory Responsibilities. Each supervisor shall accept responsibility for the safety of operations under his control.	HNF-IP-0842, II, 4.1.1 HNF-IP-0842, IV, 6.1		
2.1.1	Do line program supervisors accept responsibility for criticality safety of their operations? Is ownership demonstrated by the following: (1) Approving criticality safety postings? (2) Reviewing and approving criticality controls in procedures? (3) Participating in the development of criticality safety evaluations? (4) Participating in the development of credible process upsets for the NCS staff to consider? (5) Approving criticality safety evaluations for operations?	See HNF-IP-1266 Ch. 5.7 See HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.6 HNF-IP-0842, IV, 6.6 HNF-IP-0842, IV, 6.6 HNF-IP-0842, IV, 6.4	Yes. See below for specific actions. n/a – this Limited Control Facility does not use postings. Yes. The shift operations manager reviews and approves operating procedures, including criticality prevention specifications. Yes. The participation of Operations supervisors is required during development of evaluations. Yes. The participation of Operations supervisors is required during development of accident scenarios Yes. Operations management participates in review and approval of CSERs – the NCS program manager is the final approval.	
2.2	ANS-8.19 Sec 5.2(1) Supervisory Responsibilities. Each supervisor shall be knowledgeable in those aspects of nuclear criticality safety relevant to operations under his control. ANS-8.19 Sec 5.2(2) Supervisory Responsibilities. Training and assistance shall be obtained from the nuclear criticality safety staff.	HNF-IP-0842, II, 4.1.1 HNF-IP-0842, IV, 6.1 HNF-IP-1266 Ch. 5.7		
2.2.1	Do line program supervisors formally review credible process upsets and criticality accident scenarios analyzed by the NCS staff during development of the criticality safety evaluation?	HNF-IP-0842, II, 4.1.1 HNF-IP-0842, IV, 6.4	Yes. Operations management participates in review and approval of CSERs – the NCS program manager is the final approval.	
2.2.2	Do line program supervisors understand the underlying assumptions in criticality safety evaluations that involve configuration of equipment, facility modifications, isotopic composition, etc.?	HNF-IP-1266 Ch. 5.7	Operations supervisors are required to understand the technical basis for NCS limits and controls, including facility configuration control and the effect of modifications, waste chemistry, isotopic composition. The March 2000 internal assessment and June 2000 DOE audit found that operations supervisors interviewed did not demonstrate an adequate level of knowledge in this area. Remedial training is planned as part of the required annual update training in October 2000.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

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2.2.3	Is the NCS staff requested to provide NCS training to line program supervisors?	HNF-IP-1266 Ch. 5.7	Yes. The CSR is tasked with providing job-specific orientation in conjunction with classroom NCS training.	
2.2.4	Does line program supervision know the safety basis for the criticality controls for their operations?	HNF-IP-1266 Ch. 5.7	Operations supervisors are required to understand the technical basis for NCS limits and controls, including facility configuration control and the effect of modifications, waste chemistry, isotopic composition.	The March 2000 internal assessment and June 2000 DOE audit found that operations supervisors interviewed did not demonstrate an adequate level of knowledge in this area. Remedial training is planned as part of the required annual update training in October 2000.
2.2.5	Does the NCS staff provide advice and assistance to line program management regarding implementation of NCS controls?	HNF-IP-1266 Ch. 5.7	Yes. The CSR is tasked with this responsibility.	
2.3	ANS-8.19 Sec 5.3(1) Supervisory Responsibilities. Each supervisor shall provide training and shall require that the personnel under his supervision have an understanding of procedures and safety considerations such that they may be expected to perform their functions without undue risk.	HNF-IP-0842, II, 4.1.1 HNF-IP-1266 Ch. 5.7		
	ANS-8.19 Sec 5.3(2) Supervisory Responsibilities. Records of training activities and verification of personnel understanding shall be maintained.	HNF-IP-0842, III, 3.1 HNF-IP-1266 Ch. 5.7		
2.3.1	Do supervisors provide job specific training on procedures?	RPP-PRO-153 HNF-IP-0842, III, 3.1	Yes. The operator certification process includes continuous updating. When a procedure is issued or modified, tasks involving the procedure may not be undertaken until the required reading or dry run requirements are completed and recorded.	
2.3.2	Are walkthroughs and dry-runs on procedures provided?	HNF-IP-0815	Yes. New and extensively modified procedures are walked down as part of the approval process. For non-routine tasks, a dry-run is frequently part of the job preparation at the discretion of the project supervisor.	
2.3.3	Do pre-job briefs cover criticality controls specific to the operations at hand?	HNF-IP-0842, V, 4.1	Yes, where applicable. As a Limited Control facility, Tank Farms does not have physical controls relevant to NCS (there are administrative controls).	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

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2.3.4	Do plan-of-the-day meetings address criticality safety related topics like work restrictions due to criticality safety infractions, availability of new procedures and postings, need for NCS Staff participation, results of recent criticality safety assessments/surveillances, etc.?	HNF-IP-0842, V, 7.1	As a Limited Control facility, Tank Farms does not have physical controls relevant to NCS (there are administrative controls). When a procedure is issued or modified, tasks involving the procedure are not be undertaken until the required reading or dry run requirements are completed and recorded.	
2.3.5	Do supervisors maintain training records for their personnel?	HNF-IP-0842, III, 3.1	Yes. Supervisors are trained in the use of the site-wide automated training record system, which includes individual requirements and requalification due dates appropriate to position, plus a record of all training completed.	
2.3.6	Do supervisors ensure that their personnel are current in criticality safety classroom training?	HNF-IP-0842, III, 9.2	Yes. Supervisors are trained in the use of the site-wide automated training record system, which includes individual requirements and requalification due dates appropriate to position, plus a record of all training completed.	
2.3.7	Are there required reading records or other evidence that personnel are knowledgeable of changes to procedures, and criticality safety postings?	HNF-IP-0815	Yes. When a procedure is issued or modified, operational tasks involving the procedure may not be undertaken until the required reading or dry run requirements are completed and recorded. This limited control facility does not use postings.	
2.3.8	Can supervisors and operators answer questions about the basic criticality controls for their operations?	HNF-IP-1266 Ch. 5.7	There are no design features nor physical controls for criticality safety for this Limited Control Facility. Operations supervisors and operators are aware of allowed operations.	The March 2000 internal assessment and June 2000 DOE audit found that operations supervisors interviewed did not demonstrate an adequate level of knowledge in this area. Remedial training is planned as part of the required annual update training in October 2000.

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For Hanford Tank Farms Facility

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2.3.9	Can supervisors generally describe the contingencies and controls for the contingencies for their operations including credited engineered features and key facility assumptions, if any?	HNF-IP-1266 Ch. 5.7	All operations supervisors and operators are drilled regarding procedures and controls relevant to their positions as part of certification training. As a Limited Control Facility, tank farms focuses on the administrative controls that provide continued assurance that a criticality will remain incredible. The facility does not have design features nor physical controls for criticality safety.	The March 2000 internal assessment and June 2000 DOE audit found that operations supervisors interviewed did not demonstrate an adequate level of knowledge in this area. Remedial training is planned as part of the required annual update training in October 2000.
2.3.10	Do supervisors ensure that personnel have demonstrated an understanding of modified or revised procedures, and criticality safety postings prior to authorizing work?	HNF-IP-0815	Yes. When a procedure is issued or modified, tasks involving the procedure may not be undertaken until the required reading or dry run requirements are completed and recorded. This facility does not use postings.	
2.3.11	Are there records of job specific training on procedures and criticality safety postings?	HNF-IP-0842, III, 9.2	Yes. Supervisors are trained in the use of the site-wide automated training record system, which includes individual requirements and requalification due dates appropriate to position, plus a record of all training completed. This facility does not use postings.	
2.3.12	Do supervisors request assistance from the Nuclear Criticality Safety Staff to provide training for operations personnel?	HNF-IP-0842, III, 9.2	Yes. The CSR is tasked with providing job-specific orientation in conjunction with classroom NCS training.	
2.3.13	Do firefighters receive criticality safety training?		Yes, on a site-wide basis. As a Limited Control facility, there are no specific fire-fighting controls for tank farms (category A).	
2.3.14	Are firefighters aware of any moderator-controlled areas or processes?		Not applicable to tank farms facility.	
2.4	ANS-8.19 Sec 5.2(1) Supervisory Responsibilities. Supervisors shall develop or participate in the development of written procedures applicable to the operations under their control.	HNF-IP-0842, I, 2.11 HNF-IP-0842, II, 4.1.1 HNF-IP-0842, IV, 6.5		
	ANS-8.19 Sec 5.4(2) Supervisory Responsibilities. Maintenance of these procedures to reflect changes in operations shall be a continuing supervisory responsibility.	HNF-IP-0842, I, 2.11 HNF-IP-0842, IV, 6.5		
2.4.1	Are all fissile material handling operations performed according to approved procedures?		All operations and tasks conform to formally approved procedures per HNF-IP-0842, Vol. I Sec. 2.11. Tank Farms does not directly handle fissile material, and has no fissile material handlers.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
2.4.2	Are operations personnel or supervision involved in developing procedures?	HNF-IP-0815	Yes. There is a formal process for procedure development, including "table-top" exercises and dry runs. Key operations staff are involved in developing every procedure.	
2.4.3	Is there a mechanism to assure that only current, approved procedures, CSEs, and postings are used for operations?	HNF-IP-0842, I, 2.11	Yes. The formal procedure system provides rigorous control of procedures to assure that the correct revision is the only revision available for use. All procedures are posted on an internal web page for daily use.	
2.4.4	How does the line program supervisor know when to authorize work after all NCS requirements have been met after modifications to the existing set of controls/procedures?	HNF-IP-0842, I, 2.11	The formal procedure system provides rigorous control of procedures to assure that the correct revision is the only revision available for use.	
2.4.5	Does a clear, unambiguous link between the CSE, procedure and posting exist such that it is traceable from floor level documentation?	HNF-IP-0842, I, 2.11	Yes. Each operating procedure refers to the underlying documentation (CPS, CSE, TSR) as appropriate. A rigorous cross-check is performed for new procedures or modifications to assure that the references are current and implemented correctly. This facility does not use postings.	
2.4.6	Is there a mechanism to ensure that OSR related controls and requirements in procedures or postings are not changed without proper analysis and approval?	HNF-IP-0842, I, 2.11	Yes. The procedure control system includes a cross-check and visual flag for all TSR (OSR) requirements implemented in operating procedures.	
2.4.7	Are Unreviewed Safety Question Determinations (USQD) performed for all procedure modifications?	HNF-IP-0842, I, 2.1	A USQ screening is performed for all procedure modifications which involve technical changes. Should any answers on the screening require more investigation, a USQD is performed.	
2.5	ANS-8.19 Sec 5.5 Supervisory Responsibilities. Supervisors shall verify compliance with nuclear criticality safety specifications for new or modified equipment before its use. Verification may be based on inspection reports or other features of the quality control system.	HNF-IP-0842, IV, 6.4		
2.5.1	Are there procedures or mechanisms in place and effective to ensure that modifications to equipment and/or processes results in a review of the applicable CSEs-procedure-posting set prior to implementing the modification?	RPP-PRO-055	Yes. In both the operational and construction procedures, there are requirements for verification of applicable operating procedures. This verification step includes NCS documentation.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
2.5.2	Are there documented surveillances or methods that ensure that new or modified operations conform to applicable CSEs-procedures-postings?	HNF-IP-0815	Yes. Each operating procedure refers to the underlying documentation (CPS, CSER, TSR) as appropriate. A rigorous cross-check is performed for new procedures or modifications to assure that the references are current and implemented correctly.	
2.5.3	Is there a process for ensuring that no new or modified operation is started until all applicable verification steps have been performed which includes presence of approved CSEs, postings, procedures and that no criticality infraction will result from startup?	RPP-PRO-055	Yes. Yes. Formal startup checklists include NCS topics.	
2.6	ANS-8.19 Sec 5.6 Supervisory Responsibilities. Each supervisor shall require conformance with good safety practices including unambiguous identification of fissile materials and good housekeeping.	HNF-IP-0842, II, 4.1.1 HNF-IP-1266, Ch. 5.7 RPP-PRO-543		
2.6.1	Are stored, empty containers labeled as such?	HNF-IP-0842, IV, 6.7	Tank Farms empty sample containers are marked as empty per procedures. It would be very rare that a container would have as much as a gram of Pu.	
2.6.2	Are gloveboxes with criticality drains free of loose debris which could potentially clog the drain?		Not applicable to tank farms facility.	
2.6.3	Is fissile material stored in approved containers?	HNF-IP-0842, IV, 6.7	Procedure provides for designation of a fissile material storage area, and requires that any fissionable material not in tanks be stored in approved containers. However, the tank farms does not have a designated fissile material storage area. It would be very rare that a container would have as much as a gram of Pu.	
2.6.4	Prior to beginning work at a workstation, is there a procedure to verify compliance with criticality safety requirements?	n/a	Not applicable to tank farms as written. The tank farms facility has no physical controls for criticality safety, and is not a glovebox facility ("workstation" is not a term used here for field operations). Field work is rigorously controlled, including pre-job planning. Procedure compliance is mandatory.	
2.6.5	Is there evidence of fissile material holdup or filings in gloveboxes?	n/a	Not applicable to tank farms.	
2.6.6	Are criticality drain liquid traps monitored for adequate liquid levels periodically?	n/a	Not applicable to tank farms.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
3.0	NUCLEAR CRITICALITY SAFETY STAFF RESPONSIBILITIES			
3.1	ANS-8.19 Sec 6.1 Nuclear Criticality Safety Staff. The nuclear criticality safety staff shall provide technical guidance for the design of equipment and processes and for the development of operating procedures.	HNF-IP-1266 Ch. 5.7		
3.1.1	Does the NCS Staff provide design input for all new or modified equipment?	RPP-PRO-1622	The NCS staff would be part of the review team for major new equipment design (although not necessarily for replacement equipment where the previous equipment was deemed to not affect NCS).	
3.1.2	Does the NCS Staff review all operating procedures involving fissile materials?	HNF-IP-0815	Yes. The CSR participates in the review and approval cycle for operating procedures which refer to criticality safety specifications.	
3.1.3	Does the NCS Staff review and concur on final equipment and process designs?	RPP-PRO-1622	The CSR participates in the review cycle for such designs, but is not routinely included in the concurrence list.	
3.2	ANS-8.19 Sec 6.2(1) Nuclear Criticality Safety Staff. The staff shall maintain familiarity with current developments in nuclear criticality safety standards, guides and codes.	Qualification Card and Guide for RPP Facility Criticality Safety Engineer, 350004 HNF-IP-1266 Ch. 5.7		
	ANS-8.19 Sec 6.2(2) Nuclear Criticality Safety Staff. Knowledge of current nuclear criticality information <u>shall</u> be maintained. <i>Interpretive Guidance.</i> Criticality staff shall be able to demonstrate that they are able to obtain criticality safety information necessary to perform their duties.	Qualification Card and Guide for RPP Facility Criticality Safety Engineer, 350004 HNF-IP-1266 Ch. 5.7	Tank Farms requires CSR and alternate to complete qual card and training, periodic refreshers	
3.2.1	Do all members of the Nuclear Criticality Safety Staff understand and know how to properly utilize monte carlo codes (e.g., KENO and MCNP), criticality safety handbooks, critical experiment data, hand-calculations, etc.?	HNF-IP-1266, Ch. 5.7	The criticality safety engineers (CSE) qualified to work on technical NCS matters for the tank farms facility are qualified to use the tools needed for analysis and calculation. This qualification is mandated in the subcontract for this service. The CSR does not have detailed knowledge, but is aware of the basic concepts.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
3.2.2	Does the Contractor NCS Staff participate in professional development activities such as ANS Standards Committees, Nuclear Criticality Technology Project Workshop, ANS Meetings, LANL/LACEF courses, UNM courses, etc.?		Yes. At management discretion, the CSR and contracted CSE participate in offsite training and meetings.	
3.2.3	Is there a training and qualification program for the Contractor NCS Staff? Are all the members of the Contractor NCS Staff qualified?	HNF-IP-1266, Ch. 5.7 Qualification Card and Guide for RPP Facility Criticality Safety Engineer, 350004	Yes. The program description includes training and qualification requirements for NCS staff including subcontractors. The CSR, alternate and CSEs are qualified per internal requirements.	
3.2.4	Does the NCS Staff have working knowledge of criticality safety related standards, guides, and codes?	HNF-IP-1266, Ch. 5.7 Qualification Card and Guide for RPP Facility Criticality Safety Engineer, 350004	Yes. This is required as part of the qualification program.	
3.3	ANS-8.19 Sec 6.3 Nuclear Criticality Safety Staff. The staff shall consult with knowledgeable individuals to obtain technical assistance as needed.	HNF-IP-1266 Ch. 5.7 (applies only to RPP CSRs and assistants)	Tank Farms participates in the Hanford Center of Excellence for Criticality Safety and maintains a consulting relationship with other onsite contractors.	
3.3.1	Does a synergistic interaction exist among the NCS Staff assigned to specific facilities and the remainder of the Contractor NCS staff?		The Tank Farms NCS staff is all assigned to the facility except for subcontracted CSE. The staff participates in the Hanford Center of Excellence for Criticality Safety and maintains a consulting relationship with other onsite contractors.	
3.3.2	Does the NCS Staff consult with offsite criticality safety experts periodically, particularly retirees from the facility?		Yes. Tank Farms participates in the Hanford Center of Excellence for Criticality Safety and maintains a consulting relationship with other onsite and offsite contractors. Management assessments are periodically conducted by offsite experts. (example: March 2000 assessment).	
3.4	ANS-8.19 Sec 6.4 Nuclear Criticality Safety Staff. The staff shall maintain familiarity with all operations within the organization requiring nuclear criticality safety controls.	Qualification Card and Guide for RPP Facility Criticality Safety Engineer, 350004 HNF-IP-1266 Ch. 5.7 (applies only to RPP CSRs and assistants)		

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
3.4.1	Does the NCS Staff observe fissile material handling and processing operations?	HNF-IP-0842, Vol IV, Sec 6.1	The tank farms facility does not have fissile materials handlers nor processing operations. CSR and CSE participate in inspections of field operations periodically.	
3.4.2	Are members of the NCS Staff knowledgeable of credible abnormal process upsets applicable to facility operations?	Qualification Card and Guide for RPP Facility Criticality Safety Engineer, 350004	Yes. For this facility, there are no credible process upset scenarios per se. The NCS staff actively participates in evaluation of incoming waste prior to receipt.	
3.4.3	Does the NCS Staff attend operations planning meetings for new or restarted processes?		Yes, for receipt of waste from other facilities. (example: the NCS staff is participating in planning for receipt of waste from the Plutonium Finishing Plant).	
3.4.4	Does the NCS Staff have access to and familiarity with fissile material operating procedures?	HNF-IP-0815	Yes. The CSR participates in the review and approval cycle for procedures which invoke Criticality Prevention Specifications.	
3.4.5	Does the NCS Staff attend pre-job briefs and plan-of-the day meetings?	HNF-SD-WM-OCD-015	There has been no need for CSR participation in pre-job briefs and POD meetings at this limited control facility. The CSR provides review of planned transfers via the waste compatibility assessment process prior to that point in a task.	
3.4.6	Does the NCS Staff maintain familiarity with reports of deviations from expected process conditions even if these deviations do not result in a criticality infraction?	HNF-PROC-021, Sec. 7	Yes, via process engineering required reading.	
3.5	ANS-8.19 Sec 6.5 Nuclear Criticality Safety Staff. The staff shall assist supervision, on request, in training personnel.	HNF-IP-1266 Ch. 5.7 (applies only to RPP CSR)		
3.5.1	Does the NCS Staff participate in training personnel?	Course 350096	Yes. The CSR is tasked with providing job-specific orientation in conjunction with classroom NCS training.	
3.5.2	Is the training documented?	Course 350096	Yes. The course trainee guide includes objectives and planned materials. The site-wide automated training record system includes individual requirements and requalification due dates appropriate to position, plus a record of all training completed.	
3.5.3	Does the training provided by the NCS Staff include job specific criticality safety related information?	Course 350096	Yes. The CSR is tasked with providing job-specific orientation in conjunction with classroom NCS training.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
3.6	ANS-8.19 Sec 6.6 Nuclear Criticality Safety Staff. The staff shall conduct or participate in audits in criticality safety practices and compliance with procedures as directed by management.	HNF-IP-1266 Ch. 5.7 Sec's 3.B.2.a and 3.C.11 HNF-IP-0842, IV, 6.1	HNF-IP-1266 does not require participation by Criticality Safety Specialist.	
3.6.1	Does the NCS Staff participate in periodic audits of operations and procedures?	HNF-IP-0842, IV, 6.1	Yes. Periodic inspections include verification of procedures and operation for the facility.	
3.6.2	Are the results of audits shared among the NCS Staff?	HNF-IP-0842, IV, 6.1 TWR-3721	Yes. Required distribution is included in procedure and assessment plan.	
3.6.3	Are the results of audits reported to appropriate Facility Management?	HNF-IP-0842, IV, 6.1 TWR-3721	Yes. Required distribution is included in procedures.	
3.6.4	Are corrective actions developed for deficiencies?	HNF-IP-0842, IV, 6.1 HNF-IP-0842, I, 2.4	Yes. Corrective actions are developed for any deficiencies found via inspections, assessments or audits, and are tracked as appropriate in formal tracking systems.	
3.7	ANS-8.19 Sec 6.7 Nuclear Criticality Safety Staff. The staff shall examine reports of procedural violations and other deficiencies for possible improvement of safety practices and procedural requirements, and shall report their findings to management.		DRAFT IP-1266, Ch. 5.7	
3.7.1	Are deficiencies identified by the occurrence of criticality safety infractions reviewed by the NCS Staff?	HNF-IP-0841, II, 4.6.2 HNF-IP-0842, IV, 6.3	The procedures defining occurrence reporting and nonconformance response require NCS involvement. There have been no NCS nonconformances or infractions at this facility in many years. Through participation in the Hanford NCS center of excellence, the NCS staff is made aware of situations at other facilities which may provide useful information and practice changes.	
3.7.2	Does the NCS Staff formally report findings and recommendations to Facility Management?	HNF-IP-0842, IV, 6.3	The procedure defining NCS nonconformance response requires a written recovery plan signed by key NCS staff and senior management. There have been no NCS nonconformances or infractions at this facility in many years.	
3.7.3	Are lessons learned developed and recommendations to prevent recurrence made to Facility Management?	HNF-IP-0841, II, 4.6.2	The procedure defining occurrence reporting requires development and dissemination of lessons learned. There have been no NCS nonconformances or infractions at this facility in many years.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
3.7.4	Are all criticality safety related deficiencies captured in a database and tracked until closure is verified?	HNF-IP-0842, IV, 6.1 HNF-IP-0842, I, 2.4	Yes. Corrective actions are developed for any deficiencies found via discovery of nonconformance, inspections, assessments or audits and are tracked as appropriate in formal tracking systems.	
3.7.5	Is there a mechanism for trending criticality safety related deficiencies so that the collective significance of multiple minor incidents can be assessed and corrected?	HNF-IP-0842, I, 1.5	Yes. The procedure defining deficiency trending requires tracking of nonconformances and infractions. There have been zero NCS field incidents for the life of the tracking system at this facility.	
3.7.6	Are lessons learned from other facilities reviewed by the NCS Staff for potential application at the facilities?		Yes. Through participation in the Hanford NCS center of excellence and DOE NCS program sessions (March 2000), the NCS staff is made aware of situations at other facilities which may provide useful information and practice changes.	
4.0	OPERATING PROCEDURES			
4.1	ANS-8.19 Sec 7.1(1) Operating Procedures. Procedures shall be organized and presented for convenient use by operators. They should be free of extraneous material.	HNF-IP-0842, I, 2.11 HNF-IP-0731		
4.1.1	Are criticality controls in procedures clear, concise, free of criticality safety jargon, and easily identifiable?	HNF-IP-0815	Yes. The "procedure development" procedure contains formal requirements for format and key words.	
4.1.2	Is the criticality safety related information presented in procedures free of unnecessary detail and directly applicable to the job task being performed?	HNF-IP-0815	Yes. The "procedure development" procedure contains formal requirements for format and key words.	
4.1.3	Do the operators find the criticality safety related instructions easy to understand and follow.	HNF-IP-0815	Yes. There is minimal NCS information in operating procedures for this limited control facility. The "procedure development" procedure contains formal requirements for format and key words.	
4.2	ANS-8.19 Sec 7.2 Operating Procedures. Procedures shall include those controls and limits significant to the nuclear criticality safety of the operation.	HNF-IP-0815 HNF-IP-0842, IV, 6.5		
4.2.1	Are criticality controls included in operating procedures?	HNF-IP-0815	Yes. There is a NCS-related boundary control in one operating procedure for this limited control facility. Several procedures refer to criticality prevention specifications.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
4.2.2	Are the criticality controls clearly identified as important to safety?	HNF-IP-0815	Yes. The "procedure development" procedure contains formal requirements for format and key words. All Authorization Basis requirements are clearly marked and worded.	
4.2.3	Is there a clear, unambiguous link between criticality controls in procedures and their parent CSE?	HNF-IP-0815	Yes. Each operating procedure refers to the underlying documentation (CPS, CSER, TSR) as appropriate. A rigorous cross-check is performed for new procedures or modifications to assure that the references are current and implemented correctly.	
4.2.4	Does the Contractor have a formalized process for determining which controls are incorporated in procedures?	HNF-IP-0815	Yes. Procedure development follows a rigorous path per HNF-IP-0815.	
4.2.5	Do pre-fire plans incorporate criticality safety controls?	HNF-IP-1266, 5.7 HNF-IP-0263-TF	Not applicable to tank farms – all fire fighting is category A for this limited control facility.	
4.2.6	Are criticality-related instructions in pre-fire plans and firefighting procedures practical under actual conditions of responding to fires?	HNF-IP-1266, 5.7 HNF-IP-0263-TF	Not applicable to tank farms – all fire fighting is category A for this limited control facility.	
4.3	ANS-8.19 Sec 7.3 Operating Procedures. Supplementing and revising procedures as improvements become desirable shall be facilitated.	HNF-IP-0842, I, 2.11 HNF-IP-0842, IV, 6.5		
4.3.1	Are procedures revised based on lessons learned to reduce occurrence of deviations and infractions?	HNF-IP-0842, II, 4.6.3 HNF-IP-0842, I, 2.11	Yes. There is a formal process for incorporation of lessons learned into operating procedures.	
4.3.2	Do operators have a feedback process whereby improvements to procedures can be implemented?	HNF-IP-0842, I, 2.11	Yes. Procedure users are encouraged to take action to improve procedures. If a procedure cannot be used, stop work authority rests with every employee. There is a formalized process for procedure improvement.	
4.3.3	Are adequate resources available to facilitate procedure improvements as they are identified?	HNF-IP-0842, I, 2.11	Yes. Emphasis is placed on timely and appropriate procedure improvements.	
4.3.4	Are procedure revisions timely?	HNF-IP-0842, I, 2.11	Yes. Emphasis is placed on timely and appropriate procedure improvements.	
4.3.5	What change control mechanism is in place that assures only the current, approved procedures are utilized?	HNF-IP-0842, I, 2.11	Yes. The formal procedure system provides rigorous control of procedures to assure that the correct revision is the only revision available for use. All procedures are posted on an internal web page for daily use.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
4.4	ANS-8.19 Sec 7.4 Operating Procedures. Active procedures shall be reviewed periodically by supervision.	HNF-IP-0842, I, 2.11 HNF-IP-0842, IV, 6.5		
4.4.1	Are procedures periodically reviewed?	HNF-IP-0842, I, 2.11	Yes. An administrative procedure and tracking system assign and track the review frequency assigned to each operating procedure.	
4.4.2	Does the NCS Staff periodically participate in reviews of active operating procedures?	HNF-IP-1266, Ch 5.7	Yes. The CSR is tasked to participate in periodic review of procedures which cite CPS, and approves all procedures that implement criticality safety requirements.	
4.4.3	What mechanisms are in place to ensure that all procedures are reviewed as planned?	HNF-IP-0842, I, 2.11	There is an administrative procedure and tracking system assign and track the review frequency assigned to each operating procedure. Procedures show an expiration date, after which the procedure may not be used until reviewed, approved and re-issued.	
4.5	ANS-8.19 Sec 7.5 Operating Procedures. New or revised procedures impacting nuclear criticality safety shall be reviewed by the nuclear criticality safety staff.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.5		
4.5.1	Do new or revised procedures receive review by the NCS Staff?	HNF-IP-1266 Ch. 5.7	Yes. The CSR is tasked to participate in periodic review of procedures which cite CPS, and approves all procedures that implement criticality safety requirements.	
4.5.2	Is there a mechanism for resolving conflicting comments between the NCS Staff and the other reviewers?	HNF-IP-0842, I, 2.11	Yes. The formal procedure review process includes requirements to resolve conflicting comments.	
4.6	ANS-8.19 Sec 7.6 Operating Procedures. Procedures shall be supplemented by posted nuclear criticality safety limits or limits incorporated in operating checklists or flow sheets.	HNF-IP-0842, IV, 6.5 HNF-IP-1266, CH 5.7		
4.6.1	Are criticality safety postings easy to understand by operators?		Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.2	Do the postings contain only information controlled by the operator performing the task?		Not applicable to tank farms. This limited control facility does not use criticality safety postings.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
4.6.3	Do the postings require any analysis on the part of the operator such as decoding "IF-THEN", "EITHER-OR" type options to select appropriate controls?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.4	What is the relationship between the controls in the posting and the controls in the procedures?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.5	Is there a formalized process for determining which controls appear on postings and which appear in procedures?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.6	What mechanism is in place to ensure that the controls in the posting are consistent with those intended by the parent CSE?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.7	Are postings easy to read from normal operator positions at the workstation?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.8	Do operators rely primarily on postings to obtain their criticality safety controls?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.9	Are all the controls necessary for criticality safety included in postings?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.6.10	Is it possible to comply with the requirements of the posting and still incur a criticality safety infraction because additional controls are contained in the procedures?	n/a	Not applicable to tank farms. This limited control facility does not use criticality safety postings.	
4.7	ANS-8.19 Sec 7.7(1) Operating Procedures. Deviations from operating procedures and unforeseen alterations in process conditions that affect nuclear criticality safety shall be documented, reported to management, and investigated promptly.	HNF-IP-0842, IV, 6.5		
	ANS-8.19 Sec 7.7(2) Operating Procedures. Action shall be taken to prevent a recurrence [of deviation from operating procedure ...]	HNF-IP-0842, IV, 6.5		
4.7.1	How are infractions graded?	HNF-IP-0842, I, 1.5	There is a formal system for investigating and trending deviations from operating procedures. There have been no criticality infractions at this limited control facility for the life of the tracking system (25 years).	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
4.7.2	Are the contingencies and barriers for a given operation readily available to the NCS Staff investigating potential infractions?	HNF-IP-0842, IV, 6.4	Yes. The NCS documentation is readily available on the internal web-based procedure system.	
4.7.3	Do procedures exist to upgrade the assigned severity level of infractions due to adverse trends?	HNF-IP-0842, II, 4.6.2 HNF-IP-0842, I, 1.5	Yes. The procedures governing occurrence reporting and incident trending include grading of incidents. Should analysis indicate an adverse trend, the severity level would be updated. There have been no criticality nonconformances for the life of the tracking system (25 years).	
4.7.4	Do procedures exist to upgrade the assigned severity level of infractions due to the magnitude of the decrease in the margin of subcriticality?	HNF-IP-0842, II, 4.6.2 HNF-IP-0842, I, 1.5	Yes. The procedures governing occurrence reporting and incident trending include grading of incidents. Should analysis indicate a decrease in the margin, the severity level would be updated. There have been no criticality nonconformances for the life of the tracking system (25 years).	
4.7.5	Do operators immediately stop work, leave the immediate vicinity, notify supervision, post the area, and contact the NCS Staff promptly when a potential infraction is identified?	HNF-IP-0842, IV, 6.3	Yes. Procedures and training clearly identify the actions which must be taken should a potential criticality nonconformance or infraction be identified.	
4.7.6	Does the NCS Staff respond to the scene of a potential infraction?	HNF-IP-0842, IV, 6.3	Yes. The on-call CSR is identified in the shift managers on-call notebook.	
4.7.7	Are the responsibilities defined for responding to a potential infraction?	HNF-IP-0842, IV, 6.3	Yes. The on-call CSR is identified in the shift managers on-call notebook.	
4.7.8	Does the NCS Staff participate in management critiques of infractions, assigning levels of infraction, and developing corrective actions?	HNF-IP-0842, IV, 6.3 HNF-IP-0842, II, 4.6.4	Yes. Procedures and training clearly identify the actions which must be taken should a potential criticality nonconformance or infraction be identified. There have been no criticality nonconformances for the life of the tracking system (25 years).	
4.7.9	Are infractions resolved promptly and normal operations restarted?	HNF-IP-0842, IV, 6.3	Procedures and training clearly identify the actions which must be taken should a potential criticality nonconformance or infraction be identified. There have been no criticality nonconformances for the life of the tracking system (25 years).	
4.7.10	When the NCS Staff recommends immediate corrective actions to recover from an infraction, are these recommendations made in writing, peer reviewed, and approved by line (Facility or Program) management?	HNF-IP-0842, IV, 6.3	Procedures and training clearly identify the actions which must be taken should a potential criticality nonconformance or infraction be identified. There have been no criticality nonconformances for the life of the tracking system (25 years).	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
4.7.11	Are corrective actions stemming from criticality infractions entered in a tracking database and monitored until closure?	HNF-IP-0842, II, 1.6.2	Significant facility deficiencies are entered into the formal facility-wide tracking system ("DTS") per internal requirements. Minor corrective actions are tracked in a departmental system.	
4.7.12	Are minor criticality infractions tracked and trended?	HNF-IP-0842, II, 1.6.2	Significant facility deficiencies are entered into the formal facility-wide tracking system ("DTS") per internal requirements. Minor corrective actions are tracked in a departmental system. Minor NCS infractions would be tracked, should any occur.	
4.7.13				
4.8	ANS-8.19 Sec 7.8 Operating Procedures. Operations shall be reviewed frequently (at least annually) to ascertain that procedures are being followed and that process conditions have not been altered so as to affect the nuclear criticality safety evaluation.	HNF-IP-0842, IV, 6.1		
4.8.1	Are all operations reviewed at least annually?	HNF-IP-0842, IV, 6.1 TWR-3721	Yes. The management assessment program provides for periodic review of all operations. The NCS program assessment and inspection plan provides for periodic review of all segments of the facility on a rotating basis. Due to the nature of the facility, it was determined that each area requires review at least once each five years.	
4.8.2	How do annual reviews determine that procedures are being followed?	TWR-3721	Periodic inspections focus on both field work and procedures. Observation of field work includes verification of procedure steps for compliance.	
4.8.3	Do audits and reviews monitor the configuration of the facility and processes which could adversely affect criticality safety, such as movements of criticality detectors, installation of new equipment, inoperable emergency enunciators, etc.?	HNF-IP-0842, IV, 6.1	Yes. There are no design features which would require specific monitoring, however. This limited control facility does not require criticality detectors and alarms.	
4.8.4	Do personnel with NCS experience and knowledge of the operations perform the reviews?	HNF-IP-0842, IV, 6.1	Yes. The CSR, an operations supervisor and a qualified CSE is included in the inspections or audit team for reviews.	
4.8.5	Do the reviews examine CSEs (criticality safety evaluations) to verify that changes to the process have not compromised criticality safety?	HNF-IP-0842, IV, 6.1	Yes. Technical and program documentation are examined in conjunction with the associated operations.	
4.8.6	Are the results of the review reported to senior management as well as Facility and Program Management?	HNF-IP-0842, IV, 6.1 TWR-3721	Yes. The required reporting is included in the facility inspection/assessment plan.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
4.8.7	Are deficiencies and proposed corrective actions documented and tracked to closure?	HNF-IP-0842, II, 1.6.2	Yes. The contractor corrective actions tracking system contains mechanisms to validate closure of all action items.	
4.8.8	Are procedures in place that verify that changes to process equipment over time have not degraded compliance with criticality safety controls?	HNF-IP-0842, IV, 6.1	There are no design features nor physical controls for criticality safety at this limited control facility. Biennial program assessments look at all aspects of the program.	
4.8.9	Do annual reviews of operations look at all the elements of the criticality safety program affecting operations?	HNF-IP-0842, IV, 6.1	Biennial management assessments of the NCS program look at all aspects of the program for this limited control facility.	
5.0	PROCESS EVALUATION FOR NUCLEAR CRITICALITY SAFETY			
5.1	ANS-8.19 Sec 8.1 Process Evaluation for Nuclear Criticality Safety. Before starting a new operation with fissile materials or before an existing operation is changed, it shall be determined that the entire process will be subcritical under both normal and credible abnormal conditions.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.4		
5.1.1	Are natural phenomena hazards, especially seismic, considered in developing accident scenarios?	See list of CSER in: HNF-IP-0842, IV, 6.4	The procedure for conduct of safety analysis requires the consideration of natural phenomena.	
5.1.2	Are firefighting scenarios considered (i.e., addition of moderator, displacement of fissile material in water streams, etc.)?	See list of CSER in: HNF-IP-0842, IV, 6.4	The base CSER verified that no special firefighting controls are needed. Subsequent CSER build on this base.	
5.1.3	Do the contingencies credited represent events that are at least unlikely?	See list of CSER in: HNF-IP-0842, IV, 6.4	NCS analyses performed for the tank farms facility have confirmed that there are no credible contingencies.	
5.1.4	Are all credible process upsets considered and either controlled or dispositioned appropriately?	See list of CSER in: HNF-IP-0842, IV, 6.4	Credible process upsets are considered. The only controls required are administrative, to assure that incoming waste meets limits on fissionable material content and concentration, and there are adequate neutron-absorbers.	
5.1.5	Are the criticality safety evaluations produced in a timely fashion?	See list of CSER in: HNF-IP-0842, IV, 6.4	CSERs are in place for the bulk of facility operations, and are developed as needed for specific tasks.	Replacement CSER HNF-5296 was produced and issued (not implemented) in early 2000. Internally identified flaws have delayed implementation until a revision is accomplished. Implementation will be completed at the end of the October 2000 continuing training cycle.

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
5.1.6	Do formalized procedures exist for generating criticality safety evaluations?	HNF-IP-0842, IV, 6.4	Yes. Facility procedures comply with DOE guides.	
5.1.7	Does staff familiar with the facility and operations under consideration produce the criticality safety evaluations?	HNF-IP-1266, 5.7 HNF-IP-0842, IV, 6.4	Yes. The subcontracted CSE are facility-qualified, and are assisted by the facility CSR plus knowledgeable staff.	
5.1.8	Does the NCS Staff take full advantage of simplifying methods, bounding calculations, critical experiment data, handbook data, etc. where appropriate to minimize dependence upon monte carlo techniques?	HNF-IP-0842, IV, 6.4	Yes. Criticality safety for this limited control facility depends primarily on waste composition and chemistry. Analyses and experimental data have been used during CSER development.	
5.1.9	Does the NCS Staff have access to archived criticality safety evaluations as reference?	RMIS system	Yes. The Hanford document archive system contains all previous CSER documents, and many of the background reference documents.	
5.1.10	Do criteria and procedures exist to determine the magnitude of process change which can be implemented without revising the criticality safety evaluation?	HNF-IP-0842, IV, 6.4 T-141-CPS-0010 & -0011	Yes. The CSER determine the operations envelope, which is presented in criticality prevention specifications and implemented in operating procedures.	
5.1.11	Does the NCS Staff work as a team with operations to develop credible accident scenarios and controls?	HNF-IP-0842, IV, 6.4	Yes. The participation of Operations supervisors is required during development of evaluations.	
5.2	ANS-8.19 Sec 8.2 Process Evaluation for Nuclear Criticality Safety. The nuclear criticality safety evaluations shall determine and explicitly identify the controlled parameters and their associated limits upon which nuclear criticality safety depends.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.4		
5.2.1	Are controls developed in the criticality safety evaluation for each contingency?	See list of CSER in: HNF-IP-0842, IV, 6.4	Yes.	
5.2.2	Are controlled parameters, contingencies, and credited barriers explicitly documented?	See list of CSER in: HNF-IP-0842, IV, 6.4	Yes.	
5.2.3	Does the criticality safety evaluation identify those controls that are to be included in procedures and those that should be included in postings?	See list of CSER in: HNF-IP-0842, IV, 6.4	This limited control facility does not use postings. All NCS controls are contained in criticality prevention specifications and implemented in operating procedures.	
5.3	ANS-8.19 Sec 8.3 Process Evaluation for Nuclear Criticality Safety. The nuclear criticality safety evaluation shall be documented with sufficient detail, clarity, and lack of ambiguity to allow independent judgment of results.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.4		

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
5.3.1	Does the criticality safety evaluation conform to DOE-STD-3007-93, <i>Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Non-Reactor Nuclear Facilities</i> ?	HNF-IP-0842, IV, 6.4	CSER which were in use or under development prior to the inclusion of this technical standard do not conform. Newer CSER conform within the confines of compliance with DOE order 5480.24 (still in this facility's S/RID). CSER under development at the present are in conformance with the standard.	
5.3.2	Do the CSEs contain a system/process description with enough detail for an independent reviewer to understand the system/process sufficiently to judge the results of the criticality safety analysis?	HNF-IP-0842, IV, 6.4	Older CSER were written to a procedure which assumed that reviewers were familiar with the facility. Future CSER will be in conformance with the standard, including facility description.	
5.3.3	Is there a change control and document control system in place for criticality safety analysis?	HNF-IP-0842, IV, 4.29	Yes. CSER documents are subject to the facility document control process as supporting documents.	
5.3.4	Are internal memoranda used to communicate limits and controls in place of formal evaluations?		No.	
5.3.5	Are temporary limits and evaluations (i.e., those that expire after a specified period) used?		No.	
5.3.6	Are all assumptions fully documented in the criticality safety evaluation?	HNF-IP-0842, IV, 6.4	Yes. Each existing CSER contains or refers to documents containing all assumptions. Future CSER will conform to standard 3007, which requires all assumptions to be stated in the CSER.	
5.3.7	Can the criticality safety evaluation be read and understood by the line supervision?	HNF-IP-0842, IV, 6.4	Older CSER were not written for the direct use of operations supervisors. Future CSER will conform with standard 3007, including clarity of text for use by field operations.	
5.4	ANS-8.19 Sec 8.4 Process Evaluation for Nuclear Criticality Safety. Before starting operation, there shall be an independent assessment that confirms the adequacy of the nuclear criticality safety evaluation.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.4		

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
5.4.1	Do all criticality safety evaluations receive an independent technical peer review before approval for use?	HNF-IP-0842, IV, 6.4	Review of all CSERs by a criticality safety specialist not involved in the analysis is required by procedure. The updated procedure includes direction to use the guidelines in DOE-STD-3007-93 for generation and review of content and format. One CSER has been developed over the last five years. An independent peer review was conducted prior to issuance of the document, however management requested a second review due to questions about clarity for use by Operations staff.	The March 2000 internal assessment and June 2000 DOE audit found that review of a recently completed (but not implemented) CSER was not adequate to allow implementation. Revision of the document is underway as part of the implementation plan. The new CSER will be implemented following the next Operations continuing training cycle in October 2000.
5.4.2	Is there a process for confirming that all credited engineered features of a system or process are in place and meet the specifications anticipated by the evaluation prior to starting operations?	RPP-PRO-055	Yes. The construction procedures contain checklists for pre-start confirmation. This limited control facility, however, does not have design features for criticality safety.	.
6.0	MATERIALS CONTROL			
6.1	ANS-8.19 Sec. 9.1 Materials Control. The movement of fissile materials shall be controlled.	HNF-IP-1266 Ch 5.12 HNF-IP-0842, IV, 6.7		
6.1.2	Are procedures in place to control the movement of fissile material between material balance areas?	HNF-IP-1266 Ch 5.12 HNF-IP-0842, IV, 6.7	The waste received and stored by this limited control facility is not within a nuclear material accountability system. There are not, therefore, procedures for the movement of fissile material – there are procedures for the transfer of waste containing very small amounts of fissionable material.	
6.1.2	Are procedures in place to control movement of fissile material within a single material balance area?	HNF-IP-0842, IV, 6.7	The waste received and stored by this limited control facility is not within a nuclear material accountability system. There are not, therefore, procedures for the movement of fissile material – there are procedures for the transfer of waste containing very small amounts of fissionable material.	
6.1.3	Are procedures in place to control transfers of fissile material out of the facility?	HNF-IP-0842, IV, 6.7	The waste received and stored by this limited control facility is not within a nuclear material accountability system. There are not, therefore, procedures for the movement of fissile material – there are procedures for the transfer of waste containing very small amounts of fissionable material.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
6.1.4	Do the procedures have requirements to verify compliance with criticality safety limits at the shipping and receiving points of the transfer prior to performing the movement?	HNF-SD-WM-OCD-015	Yes. Prior to waste receipt, a compatibility assessment is performed per OCD-015, and operating procedures include verification of waste composition.	
6.1.5	Are material balance check sheets or equivalents used to maintain a running log of fissile mass contained in gloveboxes, storage arrays, etc.	WHC-SD-WM-CSCM-007	The waste received and stored by this limited control facility is not within a nuclear material accountability system. A database is maintained for gross quantity tracking of the movement of fissionable materials into and between active underground storage tanks.	
6.2	ANS-8.19 Sec. 9.2 Materials Control. Appropriate material labeling and area posting shall be maintained specifying material identification and all limits on parameters that are subject to procedural control.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.7		
6.2.1	Do fissile material labels contain all the information necessary to determine compliance to applicable NCS controls such as fissile mass, cladding, moderators, chemical form, shape, isotopic composition, etc.?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. There is a procedure for establishing such an area if needed. There is a procedure for the labeling of fissile material containers, should one be generated.	
6.2.2	Are all fissile material storage areas posted as such with criticality controls clearly identified?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. There is a procedure for establishing such an area if needed.	
6.2.3	Can the mass and location of all fissile materials in a glovebox be determined by inspection of logs posted on the glovebox?	n/a	Not applicable to tank farms facility. There are at present no fissile material storage areas at this limited control facility. Gloveboxes are not used.	
6.3	ANS-8.19 Sec. 9.3 Materials Control. If reliance is placed on neutron absorbing materials that are incorporated into process materials or equipment, control shall be exercised to maintain their continued presence with the intended distributions and concentrations.	HNF-IP-1266, Ch 5.7		
	Any use of borosilicate raschig rings shall conform to the requirements of ANSI/ANS-8.5, "Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material."	n/a	Not applicable to tank farms facility. Raschig rings are not used.	
6.3.1	Are any processes dependent upon the presence of fixed neutron absorbers?	HNF-IP-1266, Ch 5.7	No. While the presence of neutron absorber materials in the waste solids is an important part of criticality safety for this limited control facility, fixed absorbers are not credited.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
6.3.2	Are controls in place to monitor the continued effectiveness of credited neutron absorbers?	HNF-IP-1266, Ch 5.7 CPS-0010, CPS-011	The composition of existing waste was modeled with the use of available analytical data. Administrative controls are in place to assure that waste receipt and movement will not compromise the composition.	
6.3.3	Are any soluble neutron absorbers credited?	See ref docs (SD-TI-725)	No. Neutron absorbers credited in CSER for the tank farms reside in the solids portion of the waste.	
6.3.4	If soluble neutron absorbers are credited, are procedures in place to ensure they remain in their intended distribution and concentration?	n/a	Not applicable to tank farms facility. Soluble absorbers are not credited.	
6.3.5	Are practices dealing with fixed neutron absorbers generally consistent with ANSI/ANS-8.21, <i>Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors</i> ?	n/a	Not applicable to tank farms facility. Fixed neutron absorbers are not credited.	
6.4	ANS-8.19 Sec. 9.4 Materials Control. Access to areas where fissile materials is handled, processed, or stored shall be controlled.	HNF-IP-0842, II, 3.1 HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.7	Fissionable material in Tank Farms is not considered "in process," but is contained within waste in storage. Tank Farms does not directly handle fissile materials relative to the intent of this section.	
6.4.1	Is access to fissile material handling areas controlled such that only trained, qualified, and authorized personnel can handle fissile material?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. The labeling and transport procedure contains steps for establishing such an area if needed. The waste in underground storage tanks and associated equipment contains very low concentrations of fissionable materials.	
6.4.2	Does facility management verify the qualification of fissile material handlers prior to authorizing work?	HNF-IP-0842, II, 2.1	The tank farms facility does not directly handle fissile materials. Management verifies the qualification of operators prior to entry into specified positions (and maintains qualifications), and prior to startup of new and non-routine operations.	
6.5	ANS-8.19 Sec. 9.5 Materials Control. Control of spacing, mass, density, and geometry of fissile material shall be maintained to assure subcriticality under all normal and credible abnormal conditions.	HNF-IP-1266 Ch. 5.7 HNF-IP-0842, IV, 6.7		

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
	Are fissile material storage areas in conformance with the requirements of ANSI/ANS-8.7, "Guide for Nuclear Criticality Safety in the Storage of Fissile Materials" where applicable?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. There is a procedure for establishing such an area if needed. The waste in underground storage tanks and associated equipment contains very low concentrations of fissionable materials.	
6.5.1	Are containers of residue and product fissile material stored in fixed arrays or have engineered spacers attached?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. There is a procedure for establishing such an area if needed. The waste in underground storage tanks and associated equipment contains very low concentrations of fissionable materials. No engineered design features or spacing are credited.	
6.5.2	Where administrative spacing controls are in place, has the criticality safety evaluation demonstrated that the system will remain subcritical in a seismic event?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. There is a procedure for establishing such an area if needed. The waste in underground storage tanks and associated equipment contains very low concentrations of fissionable materials, and no spacing is credited.	
6.5.3	Are administrative spacing controls credited as unlikely events in criticality safety evaluations?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. There is a procedure for establishing such an area if needed. No spacing is credited for waste in tanks.	
6.5.4	Where engineered features are credited for criticality control, are inspections conducted to verify they are capable of performing the intended function?	HNF-IP-0842, IV, 6.7	There are at present no fissile material storage areas at this limited control facility. There is a procedure for establishing such an area if needed. No engineered features are credited for waste in tanks.	
6.5.5	For solution storage areas are procedures in place to detect concentration and stratification changes in the solution?	HNF-IP-0842, IV, 6.7	There are at present no fissile materials storage areas at this limited control facility. All waste transfers are evaluated for parameters important to criticality safety. Wastes stored in underground storage tanks include both liquid and solid components which contain fissionable materials in very low concentrations and amounts. Data from the characterization program to model and analyze the wastes was used to determine that no engineered features or physical controls are needed.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
6.5.6	Are fissile solutions periodically monitored for changes in pH?	HNF-SD-WM-OCD-015	There are at present no fissile materials storage areas at this limited control facility. Wastes stored in this limited control facility include both liquid and solid components which contain fissionable materials in very low concentrations and amounts. Data from the characterization program to model and analyze the wastes was used to determine that no engineered features or physical controls are needed.	
6.5.7	Do double-block-and-bleed valve arrangements, or equivalent, where the addition of fissile material is prohibited, protect isolated, inactive fissile solution storage tanks?	HNF-IP-1266, Ch 5.12 HNF-IP-1266, Ch 5.20	The equivalent arrangement protects active areas of the tank farms facility from waste generators. Isolated inactive waste storage tanks are separated by a nuclear blank or physical separation from any fissile material source.	
6.5.8	Has the criticality safety evaluation determined that all storage vaults, gloveboxes, and solution storage arrays will remained subcritical under credible seismic conditions?	See list of CSER in HNF-IP-0842, IV, 6.4	Yes.	
6.5.9	Does fissile material holdup in gloveboxes and the HVAC present a credible criticality accident scenario?	See list of CSER in HNF-IP-0842, IV, 6.4	Gloveboxes are not used at this facility. Scenarios involving tank ventilation systems have been incorporated into appropriate CSER.	
6.5.10	Is holdup of fissile material monitored and controlled?	n/a	Not applicable to the waste in this facility, which contains only small concentrations (nominally less than 0.04 gram per liter) of fissionable materials.	
6.5.11	Will fissile material in gloveboxes remain subcritical under credible firefighting scenarios?	n/a	Not applicable to this facility. Fire fighting category is A (no specific controls).	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
7.0	PLANNED RESPONSE TO NUCLEAR CRITICALITY ACCIDENTS			
7.1	ANS-8.19 Sec. 10.1 Planned Response to Nuclear Criticality Accidents. Guidance for the installation of nuclear criticality accident alarm systems may be obtained from ANSI/ANS-8.3-1979[2]			
	ANS-8.19 Sec. 10.1 Planned Response to Nuclear Criticality Accidents. Evacuation signals are addressed in the ANSI/ANS-8.3-1979[2] Immediate Evacuation Signal for Use in Industrial Installations.			
7.1.1	Does documentation exist to demonstrate that the installed criticality detectors can detect the minimum accident of concern?	n/a – see SD-WM-SAR-067 Ch. 6	Not applicable to this limited control facility. Criticality detectors are neither required nor installed.	
7.1.2	Does documentation exist to show that existing criticality detector coverage provides the necessary redundancy and detection thresholds?	n/a	Not applicable to this limited control facility. Criticality detectors are neither required nor installed.	
7.1.3	Is there one group responsible for analyzing critical detector locations?	n/a	Not applicable to this limited control facility. Criticality detectors are neither required nor installed.	
7.1.4	Is there is a procedure that governs the evaluation of criticality detector locations?	n/a	Not applicable to this limited control facility. Criticality detectors are neither required nor installed.	
7.1.5	Is the criticality alarm audible at all locations where personnel are potentially located?	n/a	Not applicable to this limited control facility. Criticality alarms are neither required nor installed.	
7.1.6	Where the alarms are not audible, are beacons present and visible?	n/a	Not applicable to this limited control facility. Criticality alarms are neither required nor installed.	
7.1.7	Does the criticality accident alarm system prevent false alarms?	n/a	Not applicable to this limited control facility. Criticality alarms are neither required nor installed.	
7.1.8	When portable, temporary alarms are used, do they meet the requirements of ANSI/ANS-8.3?	n/a	Not applicable to this limited control facility. Criticality alarms are neither required nor installed.	
7.1.9	Before portable, temporary alarms are used, is there an analysis to demonstrate that the detectors will alarm if the minimum accident of concern occurs?	n/a	Not applicable to this limited control facility. Criticality alarms are neither required nor installed.	
7.2	ANS-8.19 Sec. 10.2 (1) Planned Response to Nuclear Criticality Accidents. Emergency procedures shall be prepared and approved by management.		A criticality accident at Tank Farms is not a credible event, as documented in SD-WM-SAR-067, Sec. 6.3.2	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
	ANS-8.19 Sec. 10.2 (2) Planned Response to Nuclear Criticality Accidents. Organizations, on and off-site, that are expected to provide assistance during emergencies shall be informed of conditions that might be encountered.		A criticality accident at Tank Farms is not a credible event, as documented in SD-WM-SAR-067, Sec. 6.3.2	
	ANS-8.19 Sec. 10.2 (3) Planned Response to Nuclear Criticality Accidents. They [on and offsite organizations] shall be assisted in preparing suitable emergency response procedures.		A criticality accident at Tank Farms is not a credible event, as documented in SD-WM-SAR-067, Sec. 6.3.2	
7.2.1	Are emergency procedures available and approved?	HNF-IP-1266, Ch 5.14	Facility emergency response procedures are available and approved. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
7.2.2	Do offsite organizations participate in emergency exercises for criticality scenarios?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures. Offsite organizations routinely participate in site emergency exercises.	
7.2.3	Do offsite organizations required to respond in the event of a criticality accident have emergency response procedures?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures. Offsite organizations routinely participate in site emergency exercises.	
7.2.4	Does the NCS Staff have a role in responding to criticality accidents?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
7.2.5	Are procedures in place to provide estimates of source terms and fission estimates in the event of a criticality accident?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
7.2.6	Are offsite responders aware of the plant conditions that might be encountered in the event of a criticality accident?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures. Offsite organizations routinely participate in site emergency exercises.	
7.3	ANS-8.19 Sec. 10.3 (1) Planned Response to Nuclear Criticality Accidents. Emergency procedures shall clearly designate evacuation routes.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
	ANS-8.19 Sec. 10.3 (2) Planned Response to Nuclear Criticality Accidents. Evacuation shall follow the quickest and most direct routes practicable.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
	ANS-8.19 Sec. 10.3 (3) Planned Response to Nuclear Criticality Accidents. These routes shall be clearly identified and shall avoid recognized areas of higher risk.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
7.3.1	Do emergency procedures designate evacuation routes?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures. Evacuation routes are designated for those scenarios which require evacuation.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
7.3.2	Are evacuation routes identified and avoid areas of higher risk?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures. Evacuation routes which avoid high-risk areas are designated for those scenarios which require evacuation.	
7.4	ANS-8.19 Sec. 10.4 (1) Planned Response to Nuclear Criticality Accidents. Personnel assembly stations, outside the areas to be evacuated, shall be designated. ANS-8.19 Sec. 10.4 (2) Planned Response to Nuclear Criticality Accidents. Means to account for personnel shall be established.		A criticality accident at Tank Farms is not a credible event, as documented in SD-WM-SAR-067, Sec. 6.3.2	
7.4.1	Are personnel assembly stations clearly identified?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures. Assembly stations are well-identified.	
7.4.2	Have the designated assembly areas been analyzed in advance to minimize radiation exposure from a criticality accident?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
7.4.3	Do procedures exist to account for all facility personnel, including visitors, in the event of an evacuation?	HNF-IP-1266, Ch 5.14	Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
7.5	ANS-8.19 Sec. 10.5 (1) Planned response to Nuclear Criticality Accidents. Personnel in the area to be evacuated shall be trained in evacuation methods and informed of routes and assembly stations.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
	ANS-8.19 Sec. 10.5 (2) Planned response to Nuclear Criticality Accidents. Provision shall be made for the evacuation of transient personnel.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
	ANS-8.19 Sec. 10.5 (3) Planned Response to Nuclear Criticality Accidents. Drills shall be performed at least annually to maintain familiarity with the emergency procedures.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
7.5.1	ANS-8.19 Sec. 10.5 (4) Planned Response to Nuclear Criticality Accidents. Drills shall be announced in advance. Are personnel trained to evacuate by the quickest and most direct route?	HNF-IP-1266, Ch 5.14	A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2 Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
	7.5.2 Do personnel know where they are to assemble?	HNF-IP-1266, Ch 5.14	Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures. Drills are conducted periodically.	
7.5.3	Are criticality drills performed at least annually?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills.	

Review of Nuclear Criticality Safety Requirements
For Hanford Tank Farms Facility

RPP-6798, Revision 0

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
7.5.4	Are annual criticality drills an OSR requirement?	HNF-IP-1266, Ch 5.14 HNF-IP-1266, Ch 5.7	No. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills.	
7.5.5	Does the alarm tone for a drill mimic the alarm that will be heard in a real accident?	HNF-IP-1266, Ch 5.14 HNF-IP-1266, Ch 5.7	Not applicable to this limited control facility. The site-wide system uses the actual alarms for drills.	
7.5.6	Are personnel pre-staged for criticality alarm drills or are they at their normal work locations?	HNF-IP-1266, Ch 5.14 HNF-IP-1266, Ch 5.7	Not applicable to this limited control facility. It is Hanford practice to stage drills at all levels of participation.	
7.5.7	Do multiple building participate in criticality alarm drills?	HNF-IP-1266, Ch 5.14 HNF-IP-1266, Ch 5.7	Not applicable to this limited control facility. However, other facilities on site generate criticality drills in which tank farm staff participate as needed.	
7.5.8	Will more than one facility go into alarm if a criticality accident occurs?	HNF-IP-1266, Ch 5.14 HNF-IP-1266, Ch 5.7	It is no longer credible that multiple facilities on site will generate a criticality alarm. Tank Farm emergency response procedures accommodate the potential for a criticality accident at a nearby facility.	
7.5.9	Are facility visitors indoctrinated in proper evacuation procedures?	HNF-IP-1266, Ch 5.14 HNF-IP-1266, Ch 5.7	Yes. Facility visitors are oriented as appropriate to their role.	
7.5.10	Is an emergency command center established for criticality accident drills?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills. An emergency command center is established as needed for drills or events.	
7.6	ANS-8.19 Sec. 10.6 (1) Planned Response to Nuclear Criticality Accidents. Arrangements shall be made in advance for the care and treatment of injured and exposed persons.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
	ANS-8.19 Sec. 10.6 (2) Planned Response to Nuclear Criticality Accidents. The possibility of personnel contamination by radioactive materials shall be considered.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
7.6.1	Are procedures in place to care for injured and exposed personnel?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
7.6.2	Are area hospitals equipped and trained to handle personnel with extreme radiation exposures?	HNF-IP-1266, Ch 5.14	Yes, due to the presence of other facilities on site which could generate an accidental criticality.	
7.6.3	Are procedures in place to deal with contaminated personnel?	HNF-IP-1266, Ch 5.14	Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
7.7	ANS-8.19 Sec. 10.7 Planned Response to Nuclear Criticality Accidents. Planning shall include a program for the immediate identification of exposed individuals and shall include personnel dosimetry.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
7.7.1	Do radiation-monitoring personnel participate in criticality drills?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills. RadCon staff participate in drills as needed.	
7.7.2	Do radiation-monitoring personnel respond to the assembly areas to monitor for radioactive contamination?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills. RadCon staff respond to assembly areas as needed to monitor for contamination.	

Element ID	Requirement / Query	Implementing Document	Compliance Statement	Corrective Action
7.8	ANS-8.19 Sec. 10.8 (1) Planned Response to Nuclear Criticality Accidents. Instrumentation and procedures shall be provided for determining the radiation at the assembly area and in the evacuated area following a criticality accident. ANS-8.19 Sec. 10.8 (2) Planned Response to Nuclear Criticality Accidents. Information shall be correlated at a central control point.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2	
7.8.1	Are procedures in place to monitor radiation levels at the assembly areas?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills. RadCon staff respond to assembly areas as needed to monitor for contamination.	
7.8.2	Are both gamma and neutron detectors available?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills. RadCon staff respond to assembly areas as needed to monitor for contamination. Gamma and neutron detectors are available onsite.	
7.8.3	Are radiation-monitoring personnel trained in the interpretation of radiation data as it pertains to an ongoing criticality accident?	HNF-IP-1266, Ch 5.14	There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures and drills. RadCon staff are cross-trained with other facilities for mutual aid.	
7.8.4	Are procedures in place to move personnel from designated assembly areas in the event an unacceptably high radiation field is encountered?	HNF-IP-1266, Ch 5.14	Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	

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7.8.5	Are radiation readings reported to the emergency command center?	HNF-IP-1266, Ch 5.14	Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
7.9	ANS-8.19 Sec. 10.9 Planned Response to Nuclear Criticality Accidents. Emergency procedures shall address re-entry procedures and the membership of response teams.		A criticality accident at Tank Farms is not a credible event, as documented in FSAR Sec. 6.3.2.	
7.9.1	Do emergency response procedures address re-entry?	HNF-IP-1266, Ch 5.14	Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	
7.9.2	Can the criticality alarm system be reset remotely prior to re-entry?	n/a	Not applicable to this limited control facility. Criticality alarms are neither required nor installed.	
7.9.3	What is the membership of re-entry teams?	HNF-IP-1266, Ch 5.14	Trained re-entry teams for potential major events consist of volunteer operation, radcon and fire-fighting staff.	
7.9.4	Are members trained in the use of proper equipment such as supplied breathing air?	HNF-IP-1266, Ch 5.14	Yes. Trained re-entry teams for potential major events consist of volunteer operation, radcon and fire-fighting staff.	
7.9.5	Does the incident commander have pre-determined criteria for authorizing re-entry?	HNF-IP-1266, Ch 5.14	Yes. There is not a specific criticality response procedure for this limited control facility, as a criticality is not a credible accident under current waste conditions. A criticality would result in conditions like those of a radiological release, for which there are well-developed procedures.	

--end--

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