JUN 02 1999 Sta. 15

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 623100

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Distribution	BWHC 300 Area Stabilization Projects	623101
5. Proj./Prog./Dept./Div.: 324 SAR Upgrade	6. Design Authority/ Design Agent/Cog. Engr.: J. M. Steffen	7. Purchase Order No.: n/a

8. Originator Remarks:
FDH ESH&Q and DOE-RL review comments incorporated.
A USQ was determined to not be required as the subject document discusses criteria for a future document not currently in existence, does not affect a current Authorization Basis document, and DOE concurrence with the subject document is required.

9. Equip./Component No.: n/a

10. System/Bldg./Facility: 324 Building

11. Receiver Remarks: 11A. Design Baseline Document? [X] Yes [ ] No
N/a

12. Major Assm. Dwg. No.: n/a

13. Permit/Permit Application No.: n/a

14. Required Response Date: n/a

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	HNF-3730		0	324 Building Safety Basis Criteria Document	S,Q,E	1	1	

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION
(See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Design Authority:JM Steffen	JM Steffen	6/1/99	L1-06
1	1	MinSafe Mgr.:MS Wright	MS Wright	6/1/99	L1-02
1	1	Cog.Eng.:JF Henderson	JF Henderson	6/1/99	S87-75
1	1	Cog/Mgr.:TL Erickson	TL Erickson	6/1/99	L1-08
1	1	QA:HE Rew	HE Rew	6/1/99	L1-06
1	1	Safety:AM Horner	AM Horner	6/1/99	L6-57
1	1	Env.:DE Rasmussen	DE Rasmussen	6/1/99	L1-04

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	SRB: CD Wollam	CD Wollam	6/1/99	R3-56
3		Central Files			B1-07
3		DOE/RL Reading Room			H2-53

18. JM Steffen 6/1/99
Signature of EDT Originator Date

19. _____
Authorized Representative for Receiving Organization Date

20. [signature] 6/1/99
Design Authority/ Cognizant Manager Date

21. DOE APPROVAL (if required) Ctrl. No.
[ ] Approved
[ ] Approved w/comments
[ ] Disapproved w/comments

BD-7400-172-2 (05/96) GEF097

324 BUILDING SAFETY BASIS CRITERIA DOCUMENT

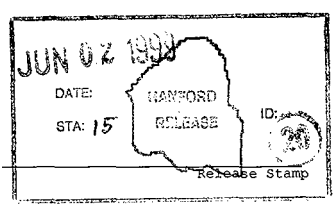
J. M. Steffen
BWHC, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 623100 UC: 2000
Org Code: 19500 Charge Code: HN990011 (CACN 101023, COA BB20)
B&R Code: EX3120020 Total Pages: ~~15~~ 19

Key Words: 324 Safety Analysis Report, 324 Operational Safety Requirements, Safety Basis Criteria, Authorization Basis, Hazard Analysis

Abstract: The Safety Basis Criteria document describes the proposed format, content, and schedule for the preparation of an updated Safety Analysis Report (SAR) and Operational Safety Requirements document (OSR) for the 324 Building. These updated safety authorization basis documents are intended to cover stabilization and deactivation activities that will prepare the facility for turnover to the Environmental Restoration Contractor for final decommissioning. The purpose of this document is to establish the specific set of criteria needed for technical upgrades to the 324 Facility Safety Authorization Basis, as required by Project Hanford Procedure HNF-PRO-705, *Safety Basis Planning, Documentation, Review, and Approval.*

Release Approval — Date: Janis Aardal 6-2-99



Approved for Public Release

324 Building

Safety Basis

Criteria Document

Prepared by:

Los Alamos Technical Associates, Inc.
Richland, WA

For

B&W Hanford Company
Richland, WA

May, 1999

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ACRONYMS AND ABBREVIATIONS

BWHC	B&W Hanford Company
Ci	Curie
D&D	Decontamination and Decommissioning
DOE	U. S. Department of Energy
FDH	Fluor Daniel Hanford
FHA	Fire Hazards Analysis
FY	Fiscal Year
MCi	megacurie
OSR	Operational Safety Requirement
HA	Hazards Analysis
PHMC	Project Hanford Management Contractor
PNNL	Pacific Northwest National Laboratory
RL	DOE Richland Operations Office
SAR	Safety Analysis Report
SEL	Safety Equipment List
SER	Safety Evaluation Report
S/RID	Standards/Requirements Identification Document
SSC	Structures, Systems, and Components
TPA	Tri-Part Agreement (*Hanford Federal Facility Agreement and Consent Order*)
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question

324 BUILDING SAFETY BASIS CRITERIA

1.0 INTRODUCTION

This criteria document describes the proposed format, content, and schedule for the preparation of an upgraded Safety Analysis Report (SAR) and Technical Safety Requirements document (TSRs) for the 324 Building. These upgraded safety basis documents are intended to cover stabilization and deactivation activities that will prepare the facility for turnover to the Environmental Restoration Contractor for final decommissioning. Stabilization and deactivation activities are scheduled for completion in Fiscal Year (FY) 2007.

1.1 BACKGROUND

The 324 Building, *Waste Technology Engineering Laboratory*, is a Category 2 nonreactor nuclear facility currently operated by B&W Hanford Company (BWHC) for the U.S. Department of Energy (DOE). Constructed in 1964 - 1965, the 324 Building was designed to be highly adaptable, and is able to accommodate the study of chemical processes, from laboratory to pilot scale, at levels of radiation from background to megacuries (MCi). The 324 Building was also used for the examination and mechanical testing of irradiated test specimens.

The radiological laboratories within the building include two hot cell facilities and various low-level analytical laboratories. The hot cell facilities include the radiochemical engineering cells and the shielded materials facility. Both of the facilities were used for high-level radiological activities and are shielded and equipped for remote operations. B-Cell, which is one of the radiochemical engineering cells, is currently being cleaned out. The low-level analytical laboratories were used for "bench top" or small-scale experiments, non-destructive examinations, and radiological systems or equipment design development.

The non-radiological laboratories, including the analytical laboratories and the high-bay addition, were used for analytical purposes, creating simulated high-level waste, full-scale equipment mock-ups, and waste remediation activities.

Support facilities include the storage vault, the craft shop, the exhaust stack, outside storage areas, and the stack monitoring facility. The storage vault was used for storing special nuclear materials (as oxides). Administrative areas include office spaces and lunchrooms for operations and support personnel.

The 324 Building is targeted for deactivation in the near future, and current plans for the Stabilization/Deactivation Project have been documented in a project management plan (BWHC 1998a). In preparation for deactivation, the 324 Building Stabilization Subproject is responsible for the removal of high-activity radioactive materials. The 324 Building is performing stabilization activities in response to *Hanford Federal Facility Agreement and Consent Order*

[Tri-Party Agreement (TPA)] milestones (Ecology et al. 1996), Closure Plan (DOE 1996b) and Project Hanford Management Contract (PHMC) performance agreements.

Stabilization of the facility, including the removal of legacy wastes and fuel material, will be completed in FY 2003. Deactivation will nominally begin in FY 2003; however, some deactivation activities--not involving fuel or wastes--may commence earlier.
The deactivation project will remove and/or reduce human health and environmental hazards associated with 324, and will place the facility in the lowest radiological classification possible. Deactivation activities concentrate on removing, reducing, and stabilizing the industrial, radiological, and chemical hazards remaining in the building at the time of transition from its operational mission. Following deactivation, the 324 Building will be placed in surveillance and maintenance mode pending final Decontamination and Decommissioning (D&D). Deactivation of the 324 Building is currently scheduled to be completed in 2007, when the facility is turned over to the Environmental Restoration and Management Contractor for surveillance and maintenance.

The 324 Building's current safety basis consists of HNF-SD-SPJ-SAR-001, *324 Building Safety Analysis Report* (BWHC 1998b), HNF-SD-SPJ-OSR-001, *Operational Safety Requirements for the 324 Building* (BWHC 1998c), and the *324 Safety Evaluation Report (SER)* (DOE-RL 1996). Technical upgrades to this safety basis are required to meet the full intent of the requirements of DOE 5480.23, *Nuclear Safety Analysis Reports*, (DOE 1992b). The key areas to be addressed in the update are listed below:

1. Adequately cover proposed deactivation activities (BWHC 1998a).
2. Evaluate the current configuration of the building and conduct a hazards analysis.
3. Address worker safety.
4. Update accident analysis and identify Safety Systems, Structures, and Components (SSCs) needed to support deactivation.
5. Incorporate the results of the current Fire Hazards Analysis (FHA).
6. Update 324 OSRs.

Engineering Change Notices (ECNs) are prepared to address changes to the current authorization basis documentation prior to the accomplishment of periodic authorization basis document revisions.

1.2 PURPOSE

The Project Hanford Management Contractor (PHMC) Implementation Plan for compliance of PHMC facilities with DOE Order 5480.22 and DOE Order 5480.23 (FDH 1999) was transmitted in May 1999 to DOE-RL. This criteria document describes how the commitments made in that document will be performed.

The purpose of this document is to establish the specific set of criteria needed for technical upgrades to the safety basis for the 324 Building. The development of a safety basis criteria document is required by Project Hanford Procedure HNF-PRO-705, *Safety Basis Planning,*

Documentation, Review, and Approval (FDH 1998b). This document provides the basis for an acceptable and adequate safety basis document. This criteria document will be approved by the Safety Review Board (SRB), sent to Fluor Daniel Hanford (FDH) and forwarded to DOE Richland Operations Office (RL) for concurrence.

Per HNF-PRO-705, this criteria document addresses the following:

- the purpose for the safety basis document and schedule for development;
- the type of document planned, its depth and detail, standards invoked, and format to be followed;
- the scope of operation or activity that the documentation will cover, the life cycle and end-state condition(s) that the safety analysis must capture;
- interfaces with other facilities or projects and their safety basis documentation ensuring that operations and activities are comprehensively and consistently addressed;
- supporting assumptions and agreements used (e.g., risk evaluation guidelines, site boundary parameters, worker safety criteria, any specific programmatic requirements); and
- the basis for approach taken (e.g., facility hazard categorization, life cycle, complexity, etc.)

Also included in this document are the safety basis document preparation and review schedules that are required to be approved by FDH and RL (FDH 1998c).

2.0 PLANNED SAFETY BASIS DOCUMENTATION

2.1 PROPOSED SAFETY BASIS UPGRADES

The existing 324 Building Safety Basis documents will be upgraded to incorporate the following changes:

1. Revise the 324 SAR to:
   a. Adequately cover proposed deactivation activities;
   b. Evaluate the current configuration of the building and conduct a hazards analysis.
   c. Address worker safety;
   d. Update accident analysis and identify Safety Systems, Structures, and Components (SSCs) needed to support deactivation; and
   e. Incorporate the results of the current Fire Hazards Analysis (FHA).

2. Upgrade the 324 OSRs to TSRs to include:
   a. Changes to the applicability statements of each TSR, as needed, to define applicable deactivation end-point criteria when the TSR can be either lessened or removed; and
   b. More prescriptive administrative controls.
3. Summarize a Safety Equipment List (SEL).

2.2 BASIS FOR APPROACH

The current 324 SAR (BWHC 1998b) and OSRs (BWHC 1998c) are administrative updates of the complete rewrite of the safety basis documentation for the 324 Building done by Pacific Northwest National Laboratory (PNNL) in 1995. The 324 SAR defines an adequate safety basis. However, it does not meet the full intent of DOE Order 5480.23 or follow the format guidelines of DOE-STD-3009. An upgraded SAR is being prepared for the 324 Building in accordance with DOE Order 5480.23, DOE-STD-3009-94, and RL program direction (DOE 1999).

Table 2-1 provides a correspondence between the requirements of DOE Order 5480.23 (as outlined in DOE-STD-3009) and the current 324 SAR. This table also indicates the proposed changes to the current 324 SAR as a result of the upgrades discussed in this criteria document.

Table 2-1. 324 Building Safety Analysis Report Correspondence with DOE Order 5480.23 (Based on Guidance in DOE Standard 3009)

SAR Chapters per DOE-STD-3009	324 SAR (HNF-SD-SPJ-SAR-001, Rev 1) Section Reference	Actions Required for the SAR Revision
Executive Summary	Section 1.0, *Introduction*, and Section 2.0, *Summary*	Update information as needed to reflect substantive changes to the SAR. The *Summary* chapter will be rewritten to include the results of the updated hazards analysis, the review and update of the TSRs and the description of associated Safety SSCs.
Site Characteristics	Section 3.0, *Site Description*	Update as required.
Facility Description	Section 4.0, *Design of Facility and Description of Operations*	Update description of operations to include deactivation activities. Out of date information (i.e., previous operations) will be deleted as needed.
Hazard and Accident Analysis	Section 6.0, *Accident Analysis*; Appendix A, *Preliminary Hazards Analysis and Accident Selection Process;* Appendix B, *Summary of the Natural Phenomena Design Evaluation Performed on the 324 Building*; and Appendix C, *Accident Analysis and Methodology Supporting Information.*	Hazard and Accident Analysis will be reviewed and updated to include additional consideration of worker safety, deactivation activities, and fire hazards. Out of date information will be deleted as needed.

Table 2-1. 324 Building Safety Analysis Report Correspondence with DOE Order 5480.23 (Based on Guidance in DOE Standard 3009)

SAR Chapters per DOE-STD-3009	324 SAR (HNF-SD-SPJ-SAR-001, Rev 1) Section Reference	Actions Required for the SAR Revision
Safety Structures, Systems, and Components (SSCs)	Section 2.3.1, *Safety Class Systems, Structures, or Components* and Section 4.5, *Safety Classification of Structures, Systems, and Components*	Safety SSCs will be updated to address the results of the hazard and accident analysis.
Derivation of Technical Safety Requirements	The bases for each OSR are covered along with each accident analyzed in Chapter 6 of the SAR. OSR's are covered in HNF-SD-SPJ-OSR-001, *Operational Safety Requirements (OSRs) for the 324 Building*	1. Review OSRs in existing 324 documentation for continuing applicability. 2. Include additional TSRs if identified during the hazards analysis process. 3. As appropriate, define the life cycle stage (including end-point criteria) at which a TSR can either be lessened or removed.
Prevention of Inadvertent Criticality	Section 5.2.1, *Prevention of Inadvertent Criticality*	Review and update as needed to address changes due to deactivation activities.
Radiation Protection	Section 5.2.2, *Radiation Protection*	Review for continuing applicability.
Hazardous Material Protection	Section 5.2.4, *Hazardous Material Protection*	Review for continuing applicability.
Radioactive and Hazardous Waste Management	Section 5.2.5, *Radioactive and Hazardous Waste Management*	Review for continuing applicability.
Initial Testing, In-Service Surveillance, and Maintenance	Section 5.2.6, *Initial Testing, In-Service Surveillance, and Maintenance*	Review for continuing applicability.
Operational Safety	Section 5.3, *Conduct of Operations*, and Section 5.2.3, *Fire Protection*	Review for continuing applicability.
Procedures and Training	Section 5.2.7, *Procedures,* and Section 5.2.8, *Training Program*	Review for continuing applicability.
Human Factors	Section 5.2.9, *Human Factors*	Review for continuing applicability.
Quality Assurance	Section 5.2.10, *Quality Assurance*	Review for continuing applicability.
Emergency Preparedness Program	Section 5.2.11, *Emergency Preparedness Program*	Review for continuing applicability.
Provisions for Decontamination and Deactivation	Section 5.2.13, *Decontamination and Decommissioning*	Revise and update to summarize and reference current D&D planning documentation.
Management, Organization, and Institutional Safety Provisions	Section 5.0, *Organization and Operational Controls and Programs*	Review for continuing applicability. Add safety policy statement.

Based upon changes to the SAR, the 324 OSRs were also completely revised in 1995. As part of that revision, the content requirements of DOE Order 5480.22 (DOE 1992a) and its associated guidance were implemented to the extent practical in an effort to take the 324 OSRs in the direction of Technical Safety Requirements (TSRs). The current OSRs will be upgraded to TSRs as needed to meet the format requirements of DOE Order 5480.22 and address any changes in the safety analysis.

Per DOE Order 5480.23, a graded approach will be used in determining the depth and detail of the safety analysis and safety basis documentation. Since the current authorization basis was completely redone recently and the 324 Building is nearing the end of its operational mission and stabilization activities have begun to reduce the nuclear inventory and associated hazards from the facility, a complete revision of the 324 Safety Basis and reformatting to match the guidelines in DOE-STD-3009 are not warranted. Section 2.3 discusses the application of the graded approach to the upgraded 324 Building Safety Basis in greater detail.

2.3 PLANNED DEPTH AND DETAIL

A graded approach will be used to determine the level of detail to be incorporated in the 324 SAR and TSR upgrades. The level of detail is dependent upon a number of factors: the need for the upgrade, the hazard potential (and hazard categorization) of the facility, its complexity, and the stage of facility life cycle. Each of these factors is discussed briefly below:

- **Need for the Upgrade** - The current safety basis documentation is a partially upgraded SAR to the content requirements of DOE Order 5480.23. The document does not meet the format requirements of DOE-STD-3009-94. An annual update to this document was completed in October 1998 which incorporated outstanding USQ evaluations and administrative updates. Additional upgrades are required for the 324 Building safety basis to:

  - Adequately cover proposed deactivation activities (see BWHC 1998a);
  - Provide hazards analysis to address worker safety and identify Safety SSCs needed to support deactivation;
  - Incorporate the results of the current Fire Hazards Analysis (FHA);
  - Update 324 TSRs to include applicability statements that define deactivation end-points when specific TSRs can either be lessened or removed; and
  - Update 324 TSRs based on the results of the hazards analyses listed above.

- **Hazard Potential and Hazard Categorization** - The 324 Building is currently categorized as a Hazard Category 2 nonreactor nuclear facility because it contains radioactive inventories over the Category 2 threshold quantities. The radiological inventory used as a bounding value for material at risk is approximately 3.7 MCi.

Current and near-term stabilization objectives include reducing the nuclear inventory and associated hazards by removing the readily retrievable, high activity wastes in the cells. These activities are to be followed by decontamination to remove dispersible radioactive and hazardous materials. This work will reduce the hazard potential, but is not expected to result in a reduction large enough to justify Hazard Category 3.

At the end of the deactivation process, as the facility prepares to be transferred to the D&D contractor, the 324 Building is expected to be categorized as a "radiological" facility at that time.

- **Facility Complexity** - The 324 Building housed a variety of programs over its more than 32 year history. By the end of FY 1999, however, the only remaining operations will be minimum safe (Section 3.1) activities, building stabilization including the removal of legacy wastes and residual radioactive materials, and deactivation activities.

- **Life Cycle Stage** - No future mission has been identified for the 324 Building. Stabilization of the facility, including the removal of legacy wastes and residual radioactive material, is scheduled for completion prior to the start of deactivation in FY 2003. Deactivation of the facility is expected to be completed by the end of FY 2007. Following deactivation, the 324 Building will be placed in surveillance and maintenance mode pending final Decontamination and Decommissioning (D&D).

2.4 STANDARDS INVOKED

BWHC has invoked DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports* (DOE 1994a), and DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, (DOE 1992c) to govern the preparation, review, and approval of the upgraded SAR for the 324 Building. Also, DOE Order 5480.22, *Technical Safety Requirement,* and DOE Order 5480.23, *Nuclear Safety Analysis Reports,* will be used to prepare the safety basis documents. Additional safety standards invoked by BWHC are documented in the *Standards/Requirements Identification Document (S/RID) for the 324/327 Buildings* (BWHC 1997). These standards and the implementing Site procedure will be summarized in the upgraded SAR for the 324 Building, in accordance with DOE-STD-3009-94.

2.5 FORMAT AND CONTENT OF THE UPGRADED 324 SAR

In view of the limited operational life of the facility and in order to remain cost effective, the upgraded 324 SAR will follow the same format as it does presently. Table 2-1 presents a review of the current safety basis to the governing DOE Standard (i.e., DOE-STD-3009-94). A correspondence between the current safety basis to the functional areas required by DOE-STD-3009-94 is also provided to demonstrate how the upgraded SAR will address these areas and the anticipated level of effort.

The following discussion provides an overview of the format and content of the upgraded SAR. Prior to revising the current AB for the 324 Building, a review will be conducted to identify and retain those portions that are adequate for the upgraded SAR. The placement of new information that will be developed during the technical upgrade of the SAR is indicated with Italics.

Executive Summary

1.0 Introduction - The Introduction contains a brief description of the facility, an overview of the hazards evaluation (including the hazard categorization and hazardous chemical assessment), and the scope and format and content of the SAR.

Editorial changes to Section 1 will be made to reflect any substantive changes in the content of the SAR. A crosswalk between the contents of the 324 SAR and the requirements of DOE Order 5480.23 (formatted according to the guidelines in DOE-STD-3009) will be included in this section.

2.0 Summary - This chapter summarizes the results of the accident analysis and identifies the TSRs and Safety SSCs relied upon in the accident analysis to assure safe operation of the 324 Building.

This chapter will be rewritten to include the results of the updated hazards analyses, including the current fire hazards analysis, and the review and update of the TSRs and description of associated Safety SSCs.

3.0 Site Description - This chapter discusses the site characteristics including those natural phenomena discussed in the accident analysis (i.e., meteorological data, seismic data, high winds, ashfall and snow loading, and floods). It also identifies adjacent population zones, industrial operations, and the location of the maximally exposed offsite individual. It addresses the impacts of adjacent facilities on 324 Building operations and vice versa.

No substantive changes to this chapter are expected to be needed.

4.0 Design of the Facility and Description of Operations - This chapter describes the facility and the current and proposed facility stabilization and deactivation activities. The design of the facility is discussed with respect to the design criteria at the time the facility was constructed and the facility's conformance to current natural phenomena design criteria. Safety Structures, Systems, and Components are identified and described.

This chapter will need to be updated to include a description of stabilization and deactivation activities, including end point criteria, and the proposed facility configuration when the facility is turned over to the Environmental Restoration Contractor.

5.0 Organization and Operational Controls and Programs - This chapter describes the facility specific programs and procedures that are in place to ensure safe operation of the facility. This discussion focuses on the 15 institutional controls or safety requirements identified in DOE Order 5480.23. Controls and requirements addressed

include radiation protection, occupational safety, fire protection, industrial safety and hygiene, criticality safety, training, waste management, quality assurance, configuration management, emergency planning, and environmental protection.

Changes to this chapter are required to the extent that institutional controls and requirements are affected by the switch from operations to stabilization/deactivation, or are identified during the updated hazards analysis (including incorporation of the FHA).

6.0 Safety Analysis - This chapter will present the safety analysis (i.e., hazards analysis and accident analysis) that evaluates the safe operation of the facility under normal and abnormal conditions. It qualitatively and quantitatively evaluates the operation of the facility to determine accident rates and potential consequences, for both radiological and hazardous chemicals, to the maximally exposed offsite and onsite individual, the facility worker, and the environment. The safety analysis is used to identify potential Safety SSCs and/or TSRs.

This chapter will be reviewed and updated with the accidents identified as a result of the new hazards analyses discussed previously (see section 2.1). The PHA will reflect the change in the 324 Building's mission and the reduced hazards found in the facility. Safety Structures, Systems, and Components identified in the accident analysis provides the basis for the selection of TSRs.

7.0 Derivation of TSRs – This chapter will support and provide the information necessary to develop the stand-alone TSR document. Derivation of TSRs will consist of summaries and references to safety analysis section of the SAR in which design and administrative controls are needed to prevent or mitigate consequences of postulated accidents.

The derivation of TSRs will be discussed following each accident scenario in Chapter6, Safety Analysis, and summarized in this chapter.

8.0 Glossary - This chapter contains a list of the units and acronyms and abbreviations used as well as the definitions of key technical terms.

This chapter will need minor administrative update only.

In addition, the 324 SAR currently contains three key appendices.

Appendix A - Hazards Analysis and Accident Selection Process - This appendix presents the HA and the bounding accident selection process. This process identifies bounding accidents that are evaluated further in Chapter 6, Safety Analysis.

Appendix A will be summarized in Chapter 6. The hazards analysis conducted in accordance with HNF-PRO-704 (FDH 1997) will be released as a stand-alone document.

Appendix B - Summary of the Natural Phenomena Design Evaluation Performed on the 324 Building - This appendix presents the methods used to calculate radiological doses to the maximally exposed onsite and offsite individuals. A description of the computer code and input data is provided.

This appendix will be incorporated into Chapter 6 as appropriate.

Appendix C - Accident Analysis and Methodology Supporting Information - This appendix contains a collection of memoranda that were used as the bases for accident descriptions, parameters, and frequency development.

This appendix will be deleted. New information required to support the hazards and accident analysis will be issued as a stand-alone document.

2.6 FORMAT AND CONTENT OF THE UPGRADED 324 TSR DOCUMENT

The upgraded 324 TSRs will follow the format and content requirements of DOE Order 5480.22, *Technical Safety Requirements.*

1.0 Use and Application - This section defines terms, operating modes, frequency notations, and actions to be taken in the event of a violation to the TSRs.

2.0 Safety Limits - This section lists limits on process variables associated with potential barrier failure. There are currently no safety limits for the 324 Building.

No safety limits are anticipated to be required for the 324 Building during stabilization/ deactivation activities.

3.0 Operational Limits - This section lists limiting control settings, and limiting conditions for operation that define the minimum controls for safe operation of the 324 Building.

This section will include any requirements identified by the additional hazards analyses discussed above (see Section 2.1). As appropriate, changes will be made to the applicability statements for each operational limit/surveillance requirement to define specific deactivation end-point criteria when the limit/requirement can be lessened or removed.

4.0 Surveillance Requirements - This section contains the requirements related to test, calibration, or inspection to ensure the necessary operability of Safety SSCs.

This section will contain the requirements necessary to maintain operation of the facility within the Limiting Conditions for Operation derived from the upgraded safety analysis.

5.0 Administrative Controls - This section contains provisions relating to organizational and management systems necessary to ensure safe operation of the facility as defined in the 324 SAR and TSRs.

This section will include any requirements identified by the additional safety analyses discussed above (see Section 2.1). In addition, administrative controls will be rewritten, as applicable, to be more prescriptive.

The current 324 Building OSRs contains four appendices.

Appendix A - Operational Safety Requirement Bases - provides a summary of the technical bases for the requirements presented in the OSR based on the upgraded safety analysis.

Appendix A will be updated as needed to support changes to the TSRs.

Appendix B - Operational Safety Requirement Violations - defines OSR violations and provides guidance on actions to take in the event an OSR is exceeded.

This information will be incorporated into a General Administrative Control as required by DOE 5480.22. The new Appendix B will identify the Design Features identified in the safety analysis.

Appendix C - Documentation and Responsibilities Guidelines - presents the documentation guidelines for demonstrating compliance with the OSRs and procedures for implementation. It also specifies organizations and individuals responsible for implementation of each OSR.

This information will be incorporated into a General Administrative Control as required by DOE 5480.22.

Appendix D - Record of Revisions - identifies and explains changes made to the OSRs.

This appendix will be revised and reissued with each revision made to the TSRs.

2.7 SCHEDULE

The revised safety basis documents for the 324 Building are scheduled to be completed and approved by FDH by August 1999. Key interim milestones and their estimated review and approval dates are found in Table 2-2.

Table 2-2. Schedule for 324 Safety Basis Technical Upgrade

Task Name	FDH Review	Final FDH Approval	DOE Submittal
Preliminary SEL	*	March 1999 (BWHC)	With SAR upgrade (For information)
TSR	July 1999	August 1999 (FDH)	With SAR upgrade
Upgraded SAR	July 1999	August 1999 (FDH)	August 1999

* The SEL is not subject to FDH review as a stand-alone document.

3.0 SCOPE OF OPERATIONS/ACTIVITIES COVERED

3.1 COVERED OPERATIONS AND ACTIVITIES

The proposed upgrade of 324 Safety Basis will cover the facility's stabilization/deactivation project activities as described in HNF-IP-1289, *324/327 Buildings Stabilization/Deactivation Project Project Management Plan.* Included in this scope are the following subproject areas:

- **Minimum Safe** - Minimum Safe subproject activities include activities required to maintain the 324 safety basis, nuclear material security, and regulatory compliance. In addition this subproject provides for overall project management. The Minimum Safe subproject comprises the building surveillance and maintenance required to maintain building systems and structures; management and assessment activities; mandated training; and safeguards and security.
- **Stabilization/Waste and Risk Reduction** - This subproject area provides for consolidation, processing, packaging, removal, and disposition of legacy wastes within the 324 Building.
- **Deactivation Preparation and Stabilization/Deactivation** - The subprojects in this area are designed to meet the objectives and endpoints for the 324 Building deactivation in order to achieve a low-cost surveillance and maintenance condition while awaiting final disposition of the building. End point specifications for the 324 Building are currently being developed (BWHC 1998e).

3.2 LIFE CYCLE PLANNING

Annual updates of the 324 Building Authorization Basis will be prepared based on the Unreviewed Safety Question (USQ) process (BWHC 1998f). The authorization basis upgrades and annual updates will address deactivation status and minimize efforts for future USQ determinations. In addition, the safety basis will contain provisions for relaxing and/or removal of Technical Safety Requirements (TSRs) as deactivation objectives are met.

The USQ evaluation process and risk reduction activities are documented in HNF-IP-1264, *324/327 Facilities Stabilization Projects Administration Manual*, Section 2.7 (BWHC 1998f). The process includes USQ screening and evaluations of work tasks, procedure changes, and building modifications.

3.3 END-STATE CONDITIONS

The safety documentation will be updated to reflect the current building conditions and controls necessary to prevent or mitigate potential hazards. This documentation is expected to be a condition for transfer of the facility to the Hanford Surplus Facilities Program at the end of the deactivation process. The 324 Building is expected to become categorized as a "radiological" building prior to turning over the facility to the D&D contractor. Based on this categorization, the appropriate safety documentation for surveillance and maintenance will be developed per the DOE Orders, standards, and other guidance and requirements in effect at the time, and will be consistent with the building endpoint activities and conditions.

4.0 INTERFACES WITH OTHER FACILITIES/PROJECTS

In order to ensure that operations and activities are comprehensively and consistently addressed, the following interfaces with other facilities/projects will be considered in the development of the 324 Safety Basis documentation.

- **Solid Waste Projects** will provide treatment, storage, and/or disposal for facility solid wastes.
  - **Central Waste Complex** will receive legacy wastes/fuels for storage/disposal.
  - **T Plant** may be used to segregate and repackage noncompliant waste.
- **PUREX Tunnel** may be used for storage of the 324 Building B-Cell dispersible/tank heels and High Level Vault packaged residuals. During deactivation and cleanout operations, additional waste may be identified for storage in the PUREX tunnels.
- **300 Area Treated Effluent Disposal Facility** is used for processing liquid effluents.
- **Tank Farms** may be used for storage of liquids from facility liquid waste streams (depending on curie level).
- **Environmental Restoration Contractor** will receive the deactivated facility for surveillance and maintenance.

5.0 ASSUMPTIONS AND AGREEMENTS

The following assumptions and agreements will be used in the development of the 324 Safety Basis Document update:

1. All 324 operations other than those described in HNF-IP-1289, *324/327 Buildings Stabilization Project Project Management Plan* will have ceased by the time the revised Safety Basis is approved by DOE.

2. The 324 Building encompasses the 324 Building, the 324A Stack Monitoring Building, and the 324B Exhaust Stack. The facility is bounded by the fence surrounding the 324 Complex, with the exception of utilities (e.g., 324 backup power) that are to be specified in the SAR. The 324 Building safety basis will address interfaces with Site infrastructure systems.

3. The frequency and consequences of each accident analyzed in the revised SAR will be evaluated against PHMC's radiological risk guidelines. These guidelines will also be used in the selection of Safety SSCs and development of the TSRs.

4. RL will review the document in accordance with DOE-STD-1104-96, *Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports.*

6.0 REFERENCES

BWHC, 1998a, *324/327 Buildings, Stabilization/Deactivation Project, Project Management Plan*, HNF-IP-1289, Revision 2, B&W Hanford Company, Richland WA.

BWHC, 1998b, *324 Building Safety Analysis Report*, HNF-SD-SPJ-SAR-001, Revision 1A, B&W Hanford Company, Richland, WA.

BWHC, 1998c, *Operational Safety Requirements for the 324 Building*, HNF-SD-SPJ-OSR-001, Revision 1, B&W Hanford Company, Richland, WA.

BWHC, 1997, *Released Standards/Requirements Identification Document - 324/327 Buildings*, HNF-SD-MP-SRID-007, April 1997, B&W Hanford Company, Richland, WA.

BWHC, 1998e, *324 Building End Point Specification Document*, HNF-2119, Revision A, B&W Hanford Company, Richland, WA.

BWHC, 1998f, *324/327 Facilities Stabilization Projects Administration Manual*, HNF-IP-1264, Section 2.7, *Unreviewed Safety Questions*, B&W Hanford Company, Richland, WA.

DOE 1992a, DOE Order 5480.22, *Technical Safety Requirement*, U. S. Department of Energy, Washington, D. C.

DOE, 1992b, DOE Order 5480.23, *Nuclear Safety Analysis Report* , U. S. Department of Energy, Washington, D. C.

DOE 1994a, DOE Standard 3009, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*, DOE-STD-3009-94, U.S. Department of Energy, Washington, D. C.

DOE 1994b, DOE Standard 3011, *Guidance for Preparation of DOE 5480.22 (TSR) and DOE 5480.23 (SAR) Implementation Plans*, DOE-STD-3011-94, U.S. Department of Energy, Washington, D. C.

DOE 1996, DOE Standard 1104, *Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports*, DOE-STD-1104-96, Department of Energy, Washington, D. C.

DOE-RL, 1996a, *Authorization of the Building 324 safety Analysis Report (SAR) and Operational Safety Requirements (OSRs)*, 96-LMD-007, dated January 18, 1996, U.S. Department of Energy, Richland Operations Office, Richland, WA.

DOE-RL, 1996b, *324 Building Radiochemical Engineering Cells High Level Vault and Low Level Vault and Associated Areas Closure Plan*, DOE/RL-96-73, U.S. Department of Energy, Richland Operation Office, Richland, WA.

DOE-RL 1999, DOE Letter, *DOE-RL Program Guidance for Development of the Authorization Basis Documentation for the 324 and 327 Facilities*, 99-TPD-171, dated April 29, 1999, U.S. Department of Energy, Richland Operations Office, Richland, WA.

Ecology et al., 1996, *Hanford Federal Facility Agreement and Consent Order*, Fifth and Sixth Amendment, Ecology Docket No. 89-10, Revision 4, Washington State Department of Ecology, U. S. Environmental Protection Agency, and U. S. Department of Energy.

FDH, 1998a, *Implementation Plan for DOE Orders 5480.22 and DOE Order 5480.23*, 1 April 1998, Fluor Daniel Hanford, Richland, WA.

FDH, 1998b, *Safety Basis Planning, Documentation, Review, and Approval*, HNF-PRO-705, Revision 1, 27 February 1998, Fluor Daniel Hanford, Richland, WA.

FDH, 1997, *Hazard and Accident Analysis Process*, HNF-PRO-704, 29 December 1997, Fluor Daniel Hanford, Richland, WA.

FDH, 1999, *Implementation Plan for DOE Orders 5480.22 and DOE Order 5480.23*, May 1999, Fluor Daniel Hanford, Richland, WA.