ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 653461

Proj. ECN S

HN 990101

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental ○ Direct Revision ◉ Change ECN ○ Temporary ○ Standby ○ Supersedure ○ Cancel/Void ○	N.F. Barilo, ESH&QA	◉ Yes ○ No	May 7, 1999

6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
300 Area Stabilization Project	327	SQ

9. Document Numbers Changed by this ECN (includes sheet no. and rev.)	10. Related ECN No(s).	11. Related PO No.
HNF-3236, Rev. 0	NA	NA

12a. Modification Work	12b. Work Package No.	12c. Modification Work Completed	12d. Restored to Original Condition (Temp. or Standby ECNs only)
○ Yes (fill out Blk. 12b) ◉ No (NA Blks. 12b, 12c, 12d)	NA	NA Design Authority/Cog. Engineer Signature & Date	NA Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? ◉ Yes ○ No

Revision of document to incorporate comments.

14a. Justification (mark one)	14b. Justification Details
Criteria Change ○ Design Improvement ◉ Environmental ○ Facility Deactivation ○ As-Found ○ Facilitate Const. ○ Const. Error/Omission ○ Design Error/Omission ○	The document is being revised to incorporate substantial internal and external comments.

15. Distribution (include name, MSIN, and no. of copies)

NF Barilo L6-57
TL Erickson L1-08
GO Hayner L1-08
AM Horner L6-57
RE Jordan S3-97
SH Norton L1-02
JM Steffen L1-06
DC West S3-96
MS Wright L1-02

Central Files B1-07
DOE-RL Reading Room H2-53

RELEASE STAMP

MAY 10 1999
DATE:
STA: 15
HANFORD RELEASE
ID:

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 653461

16. Design Verification Required	17. Cost Impact		18. Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
○ Yes	Additional ○ $ _____	Additional ○ $ _____	Improvement ○ _____
◉ No	Savings ○ $ _____	Savings ○ $ _____	Delay ○ _____

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	☐	Seismic/Stress Analysis	☐	Tank Calibration Manual	☐
Functional Design Criteria	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	Test Procedures/Specification	☐
Conceptual Design Report	☐	Installation Procedure	☐	Component Index	☐
Equipment Spec.	☐	Maintenance Procedure	☒	ASME Coded Item	☐
Const. Spec.	☐	Engineering Procedure	☐	Human Factor Consideration	☐
Procurement Spec.	☐	Operating Instruction	☐	Computer Software	☐
Vendor Information	☐	Operating Procedure	☐	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	Cell Arrangement Drawing	☐	Process Flow Chart	☐
Radiation Work Permit	☐	Essential Material Specification	☐	Purchase Requisition	☐
Environmental Impact Statement	☐	Fac. Proc. Samp. Schedule	☐	Tickler File	☐
Environmental Report	☐	Inspection Plan	☐	_____	☐
Environmental Permit	☐	Inventory Adjustment Request	☐	_____	☐

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
3MVB009, 3MVB010, 3MVB011 and 3MVB012		

21. Approvals

	Signature	Date		Signature	Date
Design Authority	NF Barilo	5/7/99	Design Agent		
Cog. Eng.	NF Barilo	5/7/99	PE		
Cog. Mgr.	TL Erickson	5/7/99	QA		
QA	HE Rew, Jr	5.10.99	Safety		
Safety	JM Steffen	5/7/99	Design		
Environ.			Environ.		
Other	AM Horner	5/7/99	Other		
DC West		5/10/99			

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

327 Building Fire Hazards Analysis Implementation Plan

N. F. Barilo
B&W Hanford Company, Richland, WA 99352
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 653461 UC: 2050
Org Code: 19500 Charge Code: 101159/BB20
B&R Code: EW04J1070 Total Pages: 10 11
KN

Key Words: 327 Building, Fire Hazards, Analysis, Implementation Plan

Abstract: BWHC will use this Implementation Plan to bring the 327 Building into compliance with DOE Order 5480.7A and RLID 5480.7.

Karen L. Noland 5/10/99
Release Approval Date Release Stamp

Approved For Public Release

RECORD OF REVISION

(1) Document Number: HNF-3236

(2) Title: 327 Building Fire Hazards Analysis Implementation Plan

Change Control Record

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) Initial release 9/16/98 EDT-623094 KN		
1 RS	Revision of document to incorporate comments ECN-653461	NF Barilo 5/6/99	TL Erickson 5/10/99

327 Building Fire Hazards Analysis Implementation Plan

May 1999

prepared for:

United States Department of Energy, Richland Operations Office
Richland, Washington

prepared by:

B&W Hanford Company

EXECUTIVE SUMMARY

In March 1998, the 327 Building Fire Hazards Analysis (FHA) (Reference 1) was approved by the U.S. Department of Energy, Richland Operations Office (DOE-RL) for implementation by B&W Hanford Company (BWHC). The purpose of the FHA was to identify gaps in compliance with DOE Order 5480.7A (Reference 2) and Richland Operations Office Implementation Directive (RLID) 5480.7 (Reference 3), especially in regard to loss limitation. The FHA identified compliance gaps in five areas and provided nine recommendations (11 items) to bring the 327 Building into compliance. A status is provided for each recommendation in this document.

BWHC will use this Implementation Plan to bring the 327 Building and its operation into compliance with DOE Order 5480.7A and RLID 5480.7.

TABLE OF CONTENTS

TERMS

BWHC	B&W Hanford Company
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
ECN	Engineering Change Notice
FHA	Fire Hazards Analysis
HEPA	High-Efficiency Particulate Air
HVAC	Heating, Ventilation, and Air Conditioning
LEL	Lower Explosive Limit
MPFL	Maximum Possible Fire Loss
NFPA	National Fire Protection Association
PNNL	Pacific Northwest National Laboratory
RLID	Richland Operations Office Implementation Directive

327 BUILDING FIRE HAZARDS ANALYSIS IMPLEMENTATION PLAN

1.0 BACKGROUND AND PURPOSE

1.1 INTRODUCTION

This report addresses corrective measures taken in order to implement the recommendations contained in the 327 Building Fire Hazards Analysis (FHA) (Ref. 1). The FHA was performed by Hughes Associates, Inc., under contract to B&W Hanford Company (BWHC) in September 1997. The FHA was based on U.S. Department of Energy (DOE) Order 5480.7A, "Fire Protection" (Ref. 2), and Richland Operations Office Implementation Directive (RLID) 5480.7, "Fire Protection" (Ref. 3). This Implementation Plan provides a summary of the FHA recommendations and actions.

1.2 PURPOSE

The FHA was performed to analyze the loss potential of an accident in accordance with the guidelines contained in DOE Order 5480.7A and RLID 5480.7. The order and directive provide guidelines that are required to be reviewed. In addition, the order and directive require compliance with certain national codes and standards, such as the National Fire Protection Association (NFPA). The FHA documents the status of the facility at meeting the guidelines, codes, and standards, and provides recommendations to bring the facility into compliance.

This Implementation Plan addresses actions associated with each FHA recommendation to bring the 327 Building into compliance with DOE Order 5480.7A and RLID 5480.7.

2.0 SUMMARY/RESULTS

The FHA performed by Hughes Associates, Inc., was a comprehensive review of this facility as it was being transferred from operation and control of Pacific Northwest National Laboratory (PNNL) to BWHC.

The FHA for the 327 Building included nine recommendations which deal with the 327 Building operations. This plan outlines BWHC's actions for addressing the FHA recommendations.

3.0 STATUS

The recommendations are shown as they appear in the FHA (Ref. 1) followed by the actions planned or completed for each recommendation and their current status.

1) Provide upgrades to the sprinkler system including the following:

(a) Provide supervised, indicating control valves for the sprinkler system. Basis: NFPA 13, Articles 2-7.1.1 and 4-14.1.1;

An expense funded Engineering Change Notice (ECN) has been prepared by Fire System Maintenance and will be implemented by Work Package 2G-97-3913. This work package will remove the control valves and bring the sprinkler system into compliance with NFPA 13, Articles 2-7.1.1 and 4-14.1.1. Completion of this work package will close out this part of the recommendation.

Status: Open. Estimated completion date - August 31, 1999.

(b) Provide adequate heat tracing for the sprinkler systems potentially exposed to freezing conditions. Basis: NFPA 13, Article 4-14.4.1; and

The storage room and north entry adjacent to the north loading dock, the north side basement stairwell, and the southwest basement stairwell/exitway are all provided with heat tracing. These systems have, in the past, been unreliable. Current plans are to provide heating in these areas (rather than heat tracing). Also, Work Package 2G-97-3913 includes a rework of the piping and the installation of dry sidewall heads for the loading dock and bottle storage area.

Completion of these items will bring the sprinkler system into compliance with NFPA 13, Article 4-14.4.1.

Status: Open. Estimated completion date - August 31, 1999.

(c) Provide flexible pipe couplings. Basis: NFPA 13, Article 4-14.3.2.

Under the present configuration, a small earthquake could cause the plain end couplings on the piping to separate and allow water to flow into many areas of the facility. A scoping walkdown of the system was performed during the July 1998 Fire Protection Assessment. The engineering cost is estimated at $75,000, which includes a detailed walkdown and design preparation. Construction is estimated at $100,000 (20 couplings at $5,000 each).

The 327 Building has a remaining life of approximately 8 to 10 years. Considering the low probability of an earthquake (unlikely category - 1E-2 to 1E-4), the expenditure of these funds is not prudent. An exemption request will be prepared by BWHC and transmitted to DOE-RL for its approval.

Status: Open. An exemption request will be submitted by September 30, 1999.

2) Maintain the current policies to limit explosive gases and combustibles/ flammable liquids introduced into the facility and into hot cells (e.g., limit exposure of sodium to water). The amount of combustible material in any air cell should not exceed the equivalent of 5 kg of hydrocarbon liquids (also includes plastics) or 27 kg of ordinary combustibles to prevent a cell fire from breaching the High-Efficiency Particulate Air (HEPA) filters.

The cell combustible loading limits identified by the FHA are very restrictive, and in some cases, impractical to implement. In many cases, the combustible load is a preexisting condition. There is no practical way to implement these controls and proceed with cleanout of the cells.

As part of the Safety Analysis revision, work has been initiated to reevaluate the assumptions and analyses from which the combustible control limits are based. This effort is necessary to provide a path forward and form the proper basis for safety and operation of the cells. Early results indicate that there is a technically justifiable basis for increasing the limits. During the interim, BWHC will operate to existing procedural controls. The revised combustible load limits, as they are developed, will be forwarded to FDH for concurrence. Revision of the FHA is estimated to be complete by September 30, 1999.

Status: Open. Estimated completion date - September 30, 1999.

3) **Ventilation in the cells handling flammable liquids and explosive gases should be assured of maintaining concentrations below 25 percent of the lower explosive limit (LEL) or explosion venting appropriate for the hazard should be provided in cells based on the enclosure strength and vent release pressure. Cell plugs exceed explosion venting vent closure weight criteria and also cause a projectile concern.**

Testing is performed on the ventilation in the cells and the cells have been maintained in a compliant fashion; however, verification with the requirements of the FHA (2.8 m^3/min - 100 cfm) has not been a requirement in the procedures. The applicable testing procedures (3MVB009, 3MVB010, 3MVB011 and 3MVB012) will be changed to include verification with the 100 cfm requirement.

Status: Open. Estimated completion date - July 31, 1999.

4) **Provide hose outlets in the structure in accordance with DOE RLID 5480.7, 8.1.e. The current maximum possible fire loss (MPFL) does not anticipate fire department intervention and does not exceed allowable limits. Therefore, an exemption to not provide hose outlets could be merited. Particularly in light of the planned decommissioning and demolition activities.**

An exemption request will be prepared by BWHC and transmitted to DOE-RL..

Status: Open. An exemption request will be submitted by September 30, 1999.

5) **Limit transient combustibles, such as wood pallets, rolls of plastic, or flammable or combustible liquids, around the switchgear area so the emergency power and normal power switches are not exposed to the same fire.**

An inspection of the area was performed on April 17, 1999. Combustibles have been removed.

Documented monthly housekeeping inspections are conducted in this facility in accordance with SI-300 Area-015, *Housekeeping Program*. The standing instruction requires a monthly housekeeping inspection for all areas of the facility, and requires senior management participation.

This standing instruction meets the intent of the HNF-PRO-368. The recommendation is considered closed.

Status: Closed.

6) **Remove storage from the exit access area to the loading dock. Basis: NFPA 101.**
OR
Remove the exit sign identifying the loading dock as an exit.

This exit is not required as an emergency exit for the 327 Building personnel. The exit sign was taken out of service (covered). This item is closed.

Status: Closed.

7) **Do not place combustibles, such as new or used HEPA filters and plastics, near the Heating, Ventilation, and Air Conditioning (HVAC) system. In particular, keep combustibles a minimum of 5 feet away from the HEPA filters in use.**

Storage areas and transient combustibles will be maintained a minimum of 5 feet from the HEPAs or combustibles will be kept in closed metal containers. The facility housekeeping checklist will be revised to include this requirement.

Status: Estimated Completion Date - August 31, 1999.

8) **Provide illuminated exit signs at the exit from the basement at the north stair and the decontamination area. Basis: NFPA 101.**

An exit sign has been provided. The sign will be illuminated by a nearby emergency light. This item is closed.

Status: Closed.

9) **Provide a redundant fire protection system within the building in accordance with DOE Order 5480.7A, 9.6.(1). Considering the MPFL, with the material at risk as provided by facility staff, the expenditure does not appear warranted for fire safety purposes and an equivalency or exemption is recommended.**

The need for a redundant fire protection system is based on the MPFL being $50 million or more. The MPFL for the 327 Building is about one-half of that figure. Therefore, a redundant fire protection system is not required for the 327 Building.

The action for this recommendation is complete. The elimination of the need for a redundant fire protection system for the 327 Building will be reflected in the next update of the 327 Building FHA.

Status: Closed.

4.0 REFERENCES

1. Hughes Associates, Inc., "327 Building Fire Hazards Analysis," HNF-SD-HT-FHA-003, Rev. 0, dated September 1997.

2. U.S. Department of Energy (DOE) Order 5480.7A, "Fire Protection."

3. Richland Operations Office Implementation Directive (RLID) 5480.7, "Fire Protection."

4. National Fire Protection Association (NFPA) 13, "Installation of Sprinkler Systems."

5. NFPA 101, "Life Safety Code."