

ENGINEERING CHANGE NOTICE	1. ECN 160230 Page 1 of <u>5</u> 3 Proj. ECN
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2. ECN Category (mark one) <input checked="" type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void	3. Originator's Name, Organization, MSIN, and Telephone No. R. H. Meichle / Safety Technical Support / X0-44 372-1509	4. Date 12/09/93
	5. Project Title/No./Work Order No. Fuel Storage Basins	6. Bldg./Sys./Fac. No. K Basins
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-OSR-006 REV 0	9. Related ECN No(s). N/A
		7. Impact Level IESQ
		10. Related PO No. N/A

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)	11b. Work Package No. N/A	11c. Modification Work Complete N/A _____ Cog. Engineer Signature & Date	11d. Restored to Original Condition (Temp. or Standby ECN only) N/A _____ Cog. Engineer Signature & Date
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12. Description of Change
 This change is to update the radioactive material discharge to the air and water limits due to issuance of DOE Order 5400.5, "Radiation Protection of the Public and the Environment".
 See Continuation Sheets details of change.

13a. Justification (mark one) As-Found <input type="checkbox"/>	Criteria Change <input checked="" type="checkbox"/>	Design Improvement <input type="checkbox"/>	Environmental <input type="checkbox"/>
	Facilitate Const. <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

13b. Justification Details
 See Continuation Sheets

14. Distribution (include name, MSIN, and no. of copies)	RELEASE STAMP OFFICIAL RELEASE BY WHC ¹⁰ DATE JAN 02 1994 Station #19
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5 ^{max} 12/14/93. ECN (use no. from pg. 1)
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15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%; text-align: center;">ENGINEERING</th> <th style="width: 50%; text-align: center;">CONSTRUCTION</th> </tr> <tr> <td>Additional <input type="checkbox"/> \$</td> <td>Additional <input type="checkbox"/> \$</td> </tr> <tr> <td>Savings <input type="checkbox"/> \$0</td> <td>Savings <input type="checkbox"/> \$0</td> </tr> </table>	ENGINEERING	CONSTRUCTION	Additional <input type="checkbox"/> \$	Additional <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$0	Savings <input type="checkbox"/> \$0	17. Schedule Impact (days) Improvement <input type="checkbox"/> Delay <input type="checkbox"/> 0
ENGINEERING	CONSTRUCTION							
Additional <input type="checkbox"/> \$	Additional <input type="checkbox"/> \$							
Savings <input type="checkbox"/> \$0	Savings <input type="checkbox"/> \$0							

18. 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 12. Enter the affected document number in Block 19.

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

19. 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
OP 59/60-07		
WHC-NR-M-2, D-403 "Monitoring of KE and KW Basins"		
WHC-IP-0856, "Effluent Monitoring Program 100 Areas"		

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog Engineer R. H. Meichle <i>RH Meichle</i>	12/9/93	PE	NA
Cog. Mgr. C. L. Bennett <i>CL Bennett</i>	12/10/93	QA	NA
QA G. M. Davis <i>Gm Davis</i>	12/13/93	Safety	NA
Safety J. L. Rathbun <i>JL Rathbun</i>	12/9/93	Design	NA
Environ. L. P. Diedeker <i>LP Diedeker</i>	12/9/93	Environ.	NA
Facilities Operations G. L. Bennett <i>GL Bennett</i>	12/9/93	Other	NA
SEAC, Process and Facilities Subcouncil R. J. Cash <i>RJ Cash</i>	12/13/93		
S. K. Foreman <i>SK Foreman</i>	12/10/93		
J. P. Schmidt <i>JP Schmidt</i>	12/9/93	DEPARTMENT OF ENERGY	
J. E. Truax <i>JE Truax</i>	12/13/93	Signature or Letter No.	93-FTB-031
		ADDITIONAL	

Description of Change:

1. Page 37 of 56, Section 3/4.4 Objective - Changed to current applicable DOE Order.
2. Page 37 of 56, Section 3.4.1.2 - Changed such that limit applies to the flow averaged concentration of all streams.
3. Page 38 of 56, Section 3.4.1.2 - Concentration guide units has been changed from pCi/l to μ Ci/ml.
4. Page 38 of 56, Section 3.4.1.2 - Concentrations changed to the Derived Concentration Guides of DOE Order 5400.5 for water.
5. Page 38 of 56, Section 3.4.1.2 - Limits for Am-241 have been added.
6. Page 39 of 56, Section 3.4.2.1 - Changed such that limit applies to the flow averaged concentration of all streams.
7. Page 39 of 56, Section 3.4.2.1 - Concentration guide units has been changed from pCi/l to μ Ci/ml.
8. Page 39 of 56, Section 3.4.2.1 - Concentrations changed to the Derived Concentration Guides of DOE Order 5400.5 for air.
9. Page 39 of 56, Section 3.4.2.1 - Limits for Am-241 have been added.
10. Page 40 of 56, Section 3.4.2.1 - Deleted mask use requirement for basin entry if concentrations guides are exceeded.
11. Page 41 of 56, Bases - Changed to reflect new DOE Order requirements.
12. Pages 42, 43 - Reset text, no content change.
13. Page 54 of 56, Section 6.4 - Updated title of criteria and procedures for unusual occurrence reporting.
14. Page 54 of 56, Section 6.5 - Added reference to DOE Order 5400.5.

Justification Details:

1. DOE Order 5400.5 now provides the release requirements to protect the public and the environment. These replaced the requirements of DOE Order 5480.1A.
- 2&6 The public dose is a function of the total radioactive material discharged from all K Basin release points. Therefore, the flow averaged concentration of all streams average for the year should be compared to the limit, rather than just the concentration at any release point. The flow averaged concentration reflects the total radioactive material being released.
- 3&7 Units presented in DOE Order 5400.5 are in μ Ci/ml, change made for consistency.

Justification Details: (Cont'd)

4. The public dose limits from 5400.5 for the water pathway are 4 mrem/yr EDE from all Hanford operations. The DCG values from 5400.5 would provide a 100 mrem/yr EDE, however since the limits are to be applied to the release point at the river, there will be a sizeable dilution. See dose estimate calculation below.
- 5&9 The Am-241 concentration in the water/air is significant and as such should be factored into comparisons against the limits.
8. The values are those for the 100 mrem/year EDE concentrations from 5400.5. Dispersion will reduce dose to well below the 10 mrem/year EDE limit for the public for airborne radioactivity from all of Hanford operations. See dose estimate calculation below.
10. Mask requirements for entry into the basin are governed by DOE Order 5480.11, "Radiation Protection for Occupational Workers," and are determined on a real time basis rather than a yearly average.
11. DOE Order 5400.5 now provides the release requirements to protect the public and the environment. These replaced the requirements of DOE Order 5480.1A.
12. Self explanatory
13. DOE Order 5000.3B title changed from previous versions.
14. DOE Order 5400.5 provides requirements for radiological protection of the public.

ESTIMATES OF DOSES BASED ON RADIOACTIVE RELEASES LIMITS TO THE RIVER

The following provides estimates of the potential doses from drinking water from radioactive material releases to the river. The values presented are basically for order of magnitude margin estimates only.

From the Process Standard D-400 the discharge flow to the river from K Area is 4.1 mgd (7.4 cfs). The annual average river flow from NUSAR Section 2.4.1.2 is 120,000 cfs. For the limits specified in the discharge flow, mixing with only 0.15% of the river flow will result in enough dilution to reduce the potential dose to below 4 mrem. Therefore, the limits provide a large margin in meeting the limits of DOE Order 5400.5.

ESTIMATES OF DOSES BASED ON RADIOACTIVE AIRBORNE RELEASES LIMITS

This following provides estimates of the onsite and offsite dose for the expected radioactive airborne releases. The values presented are basically for order of magnitude margin estimates only.

Since the unity rule applies it is only necessary to look at one isotope to estimate the public dose for the release concentration limits. For a conservative exhaust value for the K Area facility of 100,000 cfm, the SAR indicates the combined exhaust from both K basin areas is 70,000 cfm, and using the Pu-239/240 concentration limit, the $\mu\text{Ci}/\text{sec}$ release would be as follows.

Justification Details: (Cont'd)ESTIMATES OF DOSES BASED ON RADIOACTIVE AIRBORNE RELEASES LIMITS (Cont'd)

$$100,000 \text{ cfm} \times .472 \text{ l/sec/cfm} \times 1000 \text{ ml/l} \times 2 \times 10^{-14} = 9.44 \times 10^{-7} \text{ } \mu\text{Ci/sec.}$$

From NUSAR Tables 2.3-42 & 43, the χ/Q at the 320 feet from release point (nearly equivalent to facility perimeter) is 1.98×10^{-4} and 3.97×10^{-7} at 5 miles from the release point (nearly equivalent to nearest Hanford site boundary). Values selected were the peak values to specified position regardless of direction. The concentration at 320 feet is then.

$$9.44 \times 10^{-7} \text{ } \mu\text{Ci/sec} \times 1.98 \times 10^{-4} \text{ sec/cu. meter} = 1.87 \times 10^{-10} \text{ } \mu\text{Ci/cu meter}$$

$$\text{and } 1.87 \times 10^{-10} \text{ } \mu\text{Ci/cu meter} \times 1 \times 10^{-6} \text{ cu meter/ml} = 1.87 \times 10^{-16} \text{ } \mu\text{Ci/ml}$$

since a concentration of 2×10^{-14} $\mu\text{Ci/ml}$ of Pu-239/240 is equal to 100 mrem EDE the approximate onsite dose is

$$(1.87 \times 10^{-16} / 2 \times 10^{-14}) \times 100 = 0.93 \text{ mrem EDE.}$$

which is well below the onsite Safety Analysis acceptance limit of 5 rem and Safety Class 2 limit that would require mitigation and/or control.

The site boundary public dose would be:

$$(3.97 \times 10^{-7} / 1.98 \times 10^{-4}) \times 0.93 = 1.87 \times 10^{-3} \text{ mrem EDE}$$

This value is also well below the 500 mrem limit that would require Safety Class 1 SSCs for mitigation and/or control. The value is also well below the 10 mrem limit for dose to the public from all airborne radioactivity from Hanford site operations.

Therefore the values selected for comparison limits have a significant margin to any dose or safety class limits.

Complete for all Types of Release

Purpose		ID Number (include revision, volume, etc.) WHC-SD-WM-OSR-006 REV. 0-A
<input type="checkbox"/> Speech or Presentation <input type="checkbox"/> Full Paper (Check only one suffix) <input type="checkbox"/> Summary <input type="checkbox"/> Abstract <input type="checkbox"/> Visual Aid <input type="checkbox"/> Speakers Bureau <input type="checkbox"/> Poster Session <input type="checkbox"/> Videotape	<input type="checkbox"/> Reference <input type="checkbox"/> Technical Report <input type="checkbox"/> Thesis or Dissertation <input type="checkbox"/> Manual <input type="checkbox"/> Brochure/Flier <input type="checkbox"/> Software/Database <input checked="" type="checkbox"/> Controlled Document <input type="checkbox"/> Other	List attachments. ECN 160230, plus revised pages
		Date Release Requested 12/22/93

Title **OPERATIONS SAFETY REQUIREMENTS - 100-KE AND 100-KW FUEL STORAGE BASINS** Unclassified Category **UC-** Impact Level **1**

New or novel (patentable) subject matter? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If "Yes", has disclosure been submitted by WHC or other company? <input type="checkbox"/> No <input type="checkbox"/> Yes Disclosure No(s).	Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Identify)
Copyrights? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If "Yes", has written permission been granted? <input type="checkbox"/> No <input type="checkbox"/> Yes (Attach Permission)	Trademarks? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Identify)

Complete for Speech or Presentation

Title of Conference or Meeting N/A	Group or Society Sponsoring N/A
Date(s) of Conference or Meeting N/A	City/State
	Will proceedings be published? <input type="checkbox"/> Yes <input type="checkbox"/> No Will material be handed out? <input type="checkbox"/> Yes <input type="checkbox"/> No

Title of Journal
N/A

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval
			Name (printed) Signature Date
Classification/Unclassified Controlled Nuclear Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>T. E. Van der Coak</u> <u>R. J. Pyzel</u> <u>R. E. Van der Coak</u> <u>1-10-94</u> (Per OGC memo, 2/04/93)
Patent - General Counsel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Legal - General Counsel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Applied Technology/Export Controlled Information or International Program	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
WHC Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Communications	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
RL Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Publication Services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Other Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Information conforms to all applicable requirements. The above information is certified to be correct.

References Available to Intended Audience	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Transmit to DOE-HQ/Office of Scientific and Technical Information	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Author/Requestor (Printed/Signature)	Date
C. L. Bennett <u>Rio Mencher for</u>	

Intended Audience	<input type="checkbox"/> Internal <input type="checkbox"/> Sponsor <input checked="" type="checkbox"/> External
Responsible Manager (Printed/Signature)	Date
J. P. Schmidt <u>[Signature]</u>	<u>1/4/94</u>

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

Stamp is required before release. Release is contingent upon resolution of mandatory comments.



Date Cancelled _____ Date Disapproved _____

SUPPORTING DOCUMENT		1. Total Pages 58
2. Title OPERATIONS SAFETY REQUIREMENTS - 100-KE AND 100-KW FUEL STORAGE BASINS	3. Number WHC-SD-WM-OSR-006	4. Rev No. 0-A
5. Key Words K Basins, fuel storage basins, N fuel storage, KE and KW fuel storage basins, irradiated fuel, fuel storage canisters, encapsulated fuel.	6. Author Name: R. H. Meichle <i>R H Meichle</i> Signature Organization/Charge Code 11110/KK4DC	
<div style="display: flex; justify-content: space-between; align-items: center;"> <i>Km3 1/10/94</i> <div style="border: 1px solid black; padding: 5px;"> APPROVED FOR PUBLIC RELEASE </div> </div>		
7. Abstract <p>These operations safety requirements (OSRs) define the approved safety specifications and operational limits for operation of the 105-KE and 105-KW fuel storage facility. This document was originally issued by United Nuclear as UNI-M-139, Volume 1. After consolidation with Westinghouse Hanford Company (WHC), the document was approved by RL on May 11, 1989 and reissued as WHC-CM-5-28. It was subsequently approved for public release on July 7, 1992.</p>		
 8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed. <p>PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA.</p> <p>DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.</p>		10. RELEASE STAMP <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p style="text-align: center;">OFFICIAL RELEASE BY WHC</p> <p style="text-align: center;">DATE JAN 10 1994</p> <p style="text-align: center;"><i>Station #19</i></p> </div>
9. Impact Level IESQ		

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Subject	Nonreactor Nuclear Facilities KE and KW Fuel Storage Basins	Issued By Westinghouse Hanford Co.	

demineralization of the KE Basin, should cause no increase in carbon steel corrosion. (Reference: Memo, W.K. Kratzer to K.L. Fowler "KE Fuel Storage Basin pH Limits", dated January 24, 1986.)

The KW Basin walls are protected with an epoxy coating and are not subject to significant dissolution. The KE walls are not coated and are subject to minimal amount of dissolution.

3/4.4 Radioactive Materials Release

Applicability: This section applies to the release of all liquid, solid, and airborne effluents containing radioactive material from the facility.

Objective: This section specifies the conditions required to control the release of radioactive materials from the 105-KE and KW fuel storage basins to the environs and assures that all releases comply with DOE Order 5400.5.

Limiting Conditions for Operation:

3.4.1 Liquid Waste Specifications

3.4.1.1 The basin water radionuclide concentration shall be monitored to identify adverse trends.

3.4.1.2 The release of radioactive materials in liquid effluent streams discharging from the 105-KE and KW Fuel Storage Facilities to the Columbia River shall be limited such that the flow averaged concentrations of radionuclides for all the streams do not exceed the following concentration guides, unity rule applies, (averaged over a one year period):

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<u>Radionuclide</u>	<u>Concentration Guide, $\mu\text{Ci/ml}$</u>
H-3	2.0×10^{-3}
Mn-54	5.0×10^{-5}
Co-60	5.0×10^{-6}
Sr-90	1.0×10^{-6}
Ru-106	6.0×10^{-6}
Cs-134	2.0×10^{-6}
Cs-137	3.0×10^{-6}
Ce-144	7.0×10^{-6}
Pu-239/240	3.0×10^{-8}
Am-241	3.0×10^{-8}

Action: If adverse trends are indicated in basin water radionuclide concentrations, steps shall be taken to identify and correct the trend.

If the concentration guides are exceeded, an investigation shall be made to identify the source of the release and a program of corrective action shall be defined and implemented.

3.4.1.3 An effluent sampling system shall be in service sampling the 100-K outfall as follows:

- A. An automatic composite sampling system shall be in operation,
OR
- B. Grab samples shall be taken on a weekly frequency.

Action: If the above sampling requirements are not met, an investigation shall be made to determine the deficiency and the corrective action to be implemented. The inoperative sampling system shall be returned to service as soon as practicable.

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3.4.1.4 The release of liquids containing radioactive materials by way of leakage pathways discharging to the ground from the 105-KE and KW Fuel Storage Facility shall be monitored by means of basin drawdown testing performed at least once a month.

Action: If the drawdown testing requirement is not met, an investigation shall be made to identify the deficiency and determine the corrective action to be implemented.

3.4.2 Airborne Waste Specifications

3.4.2.1 The release of radioactive materials from the KE and KW Fuel Storage Facilities to the atmosphere shall be limited such that the flow averaged concentration of radionuclides for all airborne effluent stream do not exceed the following concentration guides, unity rule applies, (averaged over a one year period):

<u>Radionuclide</u>	<u>Concentration, $\mu\text{Ci}/\text{ml}$</u>
H-3	1.0×10^{-7}
Mn-54	2.0×10^{-9}
Co-60	8.0×10^{-11}
Sr-90	9.0×10^{-12}
Ru-106	3.0×10^{-11}
Cs-134	2.0×10^{-10}
Cs-137	4.0×10^{-10}
Ce-144	3.0×10^{-11}
Pu-239/240	2.0×10^{-14}
Am-241	2.0×10^{-14}

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<p><u>Action:</u> If the concentration guides are exceeded an investigation shall be made to identify the source of the release and a program of corrective action shall be defined and implemented.</p> <p>3.4.2.2 An effluent sampling system shall be in service sampling the exhausted 105-KE and KW Storage Basin air as follows:</p> <p style="margin-left: 40px;">A. An automatic composite sampling system shall be in operation, <u>OR</u></p> <p style="margin-left: 40px;">B. Grab samples shall be taken on a weekly frequency.</p> <p><u>Action:</u> If the above sampling requirements are not met, an investigation shall be made to determine the deficiency and the corrective action to be implemented. The inoperative composite sampling system shall be returned to service as soon as practicable.</p> <p><u>Surveillance Requirements:</u></p> <p>4.4.1 Liquid Waste Specifications</p> <p style="margin-left: 40px;">Composite samples from the 100-K outfall shall be obtained and analyzed at least once per month.</p> <p>4.4.2 Airborne Waste Specifications</p> <p style="margin-left: 40px;">Composite samples of the 105-KE and KW Storage Basin exhaust air shall be obtained and analyzed at least once per month.</p>			

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<p><u>Exceptions:</u> The weekly grab samples or their composites may be analyzed once a month to substitute for the monthly analysis of composite samples of 4.4.1 and 4.4.2 surveillance requirements.</p> <p><u>Bases:</u> There are no control or mitigation systems or administrative actions utilized to limit the release of radioactivity to the air or water, however monitoring is performed for comparison with the specification values. These specification values are the Derived Concentration Guide (DCG) values of DOE Order 5400.5, "Radiation Protection of the Public and the Environment", for air and water. The DCG values are imposed for facility releases rather than at the location of the public, and the resultant doses are well within the requirements of DOE Order 5400.5.</p> <p>3/4.5 <u>Heat Exchanger Differential Pressure</u></p> <p><u>Applicability:</u> Applies to the heat exchangers water pressure.</p> <p><u>Objective:</u> Define the minimum allowable pressure differential between the two sides of the heat exchangers.</p> <p><u>Limiting Condition for Operation:</u></p> <p>3.5.1 The pressure on the tube side shall be eight psig or more than the pressure on the shell side of the operating heat exchanger.</p>			

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<p><u>Action:</u> Shut off the recirculating pump, if it has not been tripped off by the differential pressure device.</p> <p>Operation may continue on the basin chiller, once the heat exchanger has been isolated on the shell side. Isolation shall occur within four hours.</p> <p><u>Surveillance Requirement</u></p> <p>4.5.1 The differential pressure sensing equipment shall be calibrated quarterly.</p> <p><u>Action:</u> Follow action item of 3.5.1 above until calibration has been completed.</p> <p><u>Bases:</u> Maintaining the differential pressure above eight psi will ensure any heat exchanger tube leakage will be from the tube side (clean water) to the shell side (radioactive water). This will prevent the pool coolant, which contains radioactivity, from passing into the tube side and being discharged to the Columbia River.</p> <p>3/4.6 <u>Tornado Missiles</u></p> <p><u>Applicability:</u> Applies to the area west of the storage basin to the fence between a southwest and northwest line from the south and north corners of each basin structure. See cross hatched area of Figure 3/4-1, page 44.</p> <p><u>Objective:</u> To prevent damage to the basin and its structures from tornado missiles.</p>			

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<u>Limiting Conditions for Operation:</u>			
<p>3.6.1 The area west of the basins as defined above shall be kept free of tornado missiles which are defined as objects between 50 and 4000 pounds in weight.*</p> <p style="padding-left: 40px;"><u>Action:</u> The area shall be cleared of tornado missiles as soon as practicable, but not to exceed a week or fuel shipments into the subject basin shall be halted.</p> <p style="padding-left: 40px;"><u>Surveillance Requirements:</u></p> <p>4.6.1 The area west of each K area basin shall be inspected monthly to determine that there are no tornado missiles in the area. Records of the inspections shall be maintained.</p> <p style="padding-left: 40px;"><u>Action:</u> Perform the inspection as soon as practicable after identification of the surveillance interval violation, not to exceed one month.</p> <p style="padding-left: 40px;"><u>Bases:</u> Objects the size and weight of automobiles are not likely to become airborne missiles. The prevailing winds may vary from southwest in the winter to the northwest in the summer. Tornadoes tend to follow the prevailing wind directions so clearing the westerly area of potential missiles will minimize the possibility of tornado missiles. Missiles would be expected to disturb mostly the suspended fuel storage by damage to the structure or fuel supporting members.</p>			
*NUSAR, WHC-SP-0297, Section 3.3.3.1 "Description of Tornado Generated Missile".			

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<p>6.1.5 The Radiological Control organization will provide the radiation monitoring personnel necessary for the operation of the facility. This organization is also responsible for assuring that radiological controls are provided to maintain radiation exposure to personnel as low as reasonably achievable (ALARA).</p> <p>6.1.6 The Industrial Safety organization is responsible for assuring that appropriate industrial safety and industrial hygiene controls are provided in accordance with applicable requirements.</p> <p>6.2 <u>Training</u></p> <p>6.2.1 All persons working at the facilities shall be trained to the extent necessary to assure safe execution of their duties in the following areas:</p> <p style="padding-left: 40px;">Radiological Health and Safety Industrial Safety Emergency Procedures</p> <p>6.2.2 All persons involved in the control, handling, storage, processing or transferring of fissile materials in quantities that could support a chain reaction shall be trained in the area of nuclear criticality safety. Retraining shall be done annually and qualification verified every two years by discussion with the trainee and sign off of the training record by the trainer.</p> <p>6.3 <u>Procedures</u></p> <p>6.3.1 An operating procedures program shall be maintained and shall include written procedures, applicable checkoff lists, and</p>		

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<p style="text-align: center;">specific review and approval authorities. The program shall be designed to ensure operation within the Operations Safety Requirements.</p> <p>6.3.2 An emergency procedures program shall be maintained and shall include written procedures to provide preplanning for , and guidance during, potential emergency conditions.</p> <p>6.4 <u>Action to be Taken in the Event of an Unusual Occurrence</u> The unusual occurrence (UO) criteria and procedures for notification, investigation, and reporting of occurrences are found in MRP 5.14, "Occurrence Reporting and Processing of Operations Information", of the Management Requirements and Procedures, (WHC-CM-1-3)</p> <p>6.5 <u>Radiological Control</u> A radiation protection program shall be maintained to assure that radiation exposures to individuals in controlled areas and to population groups comply with the radiation protection standards specified in DOE Orders 5480.11, (12-21-88) and RLIP 5480.11 (4-24-91) and DOE Order 5400.5, "Radiation Protection of the Public and the Environment." The program shall include written requirements and procedures for control of radiation exposure to occupationally exposed individuals and to the public, for internal and external dosimetry for occupationally exposed individuals, for control or radioactive material and for respiratory protection to keep internal deposition of radioactive material as low as reasonably achievable.</p>			