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Title/Desc:

PRELIMINARY DESIGN REVIEW REPORT FOR K BASIN DOSE
REDUCTION PROJECT

Pages: 43

JAN 26 1996

21

ENGINEERING DATA TRANSMITTAL

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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-SNF-ERR-003		0	Conceptual Design Review Report for K Basin Dose Reduction Project Clean and Coat Task	ESQ	1,2	1	
2	WHC-SD-SNF-DRR-004		0	Preliminary Design Review Report for K Basin Dose Reduction Project	ESQ	1,2	1	

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

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G)	(H)	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog. Eng.	RF Creed	1-25-96	X3-85	K Basin Operations	WH Closs	1-25-96	X3-72	1	1
1	1	Cog. Mgr.	FW Moore	1-25-96	X3-85						
1	1	QA	Diehl	1-25-96	X3-80						
1	1	Safety		1-25-96	X3-80						
1	1	Env.	RG Gant	1-25-96	X3-79						
1	1	Design Agent	LD Blackburn	1-25-96	MS-53						
1	1	Design Auth.	WA Frier	1-25-96	X3-74						

18. Signature of EDT Originator L. D. Blackburn Date: 1-25-96	19. Authorized Representative for Receiving Organization F. W. Moore Date: 1/25/96	20. Cognizant Manager R. B. Pan Date: 1/25/96	21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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Preliminary Design Review Report for K Basin Dose Reduction Project

L. D. Blackburn

ICF Kaiser Hanford Company, Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-87RL10930

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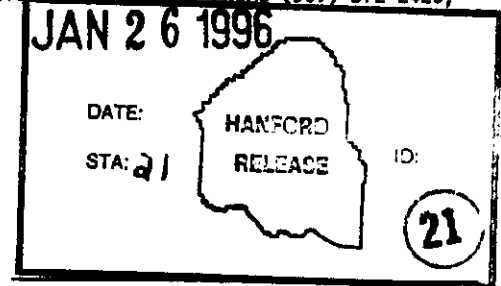
Key Words: K Basin, Dose Reduction

Abstract: The strategy for reducing radiation dose, originating from radionuclides absorbed in the K East Basin concrete, is to raise the pool water level to provide additional shielding. This report documents a preliminary design review conducted to ensure that design approaches for cleaning/coating basin walls and modifying other basin components were appropriate. The conclusion of this review was that design documents presently completed or in process of modification are an acceptable basis for proceeding to complete the design.

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Karen A. Moland 1/26/96
Release Approval Date



Approved for Public Release

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PRELIMINARY DESIGN REVIEW REPORT FOR K BASIN DOSE REDUCTION PROJECT

1.0 INTRODUCTION

A major source of radiation above the water level in the 105 K-East Basin is the radionuclide inventory absorbed into the concrete walls. The current strategy for reducing radiation dose is to raise the water level in the basin. The concrete above the present water level must be coated with a material that will prevent absorption of radionuclides into the newly submerged portion of the wall. Early work on dose reduction identified design concepts that did not involve raising the water level. Project plans and documents were based on removal of significant thickness of concrete both above and below the water line, followed by application of coating to prevent reabsorption of radionuclides. Only recently have all the issues related to raising the water level been resolved in favor of that strategy. It was therefore judged appropriate to conduct a preliminary (50%) design review to ensure that development of project design documentation would be complete and consistent with the actual concept being implemented.

2.0 SCOPE

The documents reviewed are identified in the List of Documents appended to this report. Copies are retained in Dose Reduction Project files.

This review covered the cleaning and coating of the basin walls above the present water level, and the design of an extension of the cartridge filter pit wall to prevent overflow of basin water into the pit. Conceptual design of equipment for the clean and coat task was addressed in a separate review conducted in parallel with the present one. Results of that review are documented in *Conceptual Design Review Report for K Basin Dose Reduction Project Clean and Coat Task*, MHC-SD-SNF-DRR-003, Rev. 0. Activities covered in that report are not included here. Modifications to skimmer wires and weasel pit isolation screen are necessary before raising the water level, but design of these modifications is not within the scope of this review.

3.0 SUMMARY

The design review process included a Design Review Briefing held on December 6, 1995 and a Design Review Meeting held on January 4, 1996. At the Design Review Meeting, all comments submitted by committee members and dispositions proposed by the design team were reviewed and discussed, as necessary. A design review checklist was completed. The conclusion of the meeting was that new documents and draft modifications to existing documents are an acceptable basis for proceeding to complete the design. The action item list provided in this report identifies items that should be addressed in completing design documentation.

4.0 DOCUMENTATION

The documentation provided as part of this report includes:

List of Documents that were reviewed (Appendix A);

Copy of completed Design Review Checklist (Appendix B);

List of Design Review committee members (Appendix C);

Copies of Review Comment Records generated by committee members (Appendix D);

List of Action Items that should be addressed in completing design documentation (Appendix E);

Design Review Briefing presentation graphics (Appendix F);

Meeting minutes for Design Review Meeting (Appendix G).

APPENDIX A

LIST OF DOCUMENTS REVIEWED

Numbered Documents

ECN 190567 to and original of *Functions and Requirements for the 105 K-East Basin Dose Reduction Project*, WHC-SD-SNF-FRD-001, Rev. 0.

Project Management Plan for Project A.8, Loadout Dose Management, WHC-SD-SNF-PMP-007, Rev. 0.

Design Review Report for the 105 K-East Basin Dose Reduction Concept, WHC-SD-SNF-DRR-002, Vol. 1, Rev. 0.

WHC Internal Memo BVW-8D420-94-005, Evaluation of Structural Impact of Increased Water Level (B. V. Winkel, author)

ECN 190566 to and original of *Specification for 105 K East Basin Dose Reduction Project Decon and Seal Task*, WHC-S-0375, Rev. 0.

ECN 190564 to Drawing H-1-34692, Rev. 1, Sh. 1.

Design Analysis, Calc. No. 100KE-01

ECN 611951 to Drawing H-1-34710, Rev. 1, Sh. 1.

Informal Documents

Dose Reduction Project Background

Design Review Scope

Investigation Notes, Raising Water Level in K East Basin

Process Flow Diagram

Cost Estimates

Schedule

Statement of Work for the 105 K East Basin Dose Reduction Project
Coating Equipment and Material

Response to Request for Proposal, Coating Equipment and Material for Use
in the 105 K East Basin Dose Reduction Project, Oceaneering
International, Inc.

Options for Extending Cartridge Filter Wall

ALARA Considerations: Option C

APPENDIX B
Design Review Checklist

DESIGN REVIEW CHECKLIST

	YES	NO	N/A
Does the design comply with operational needs and limitations?			✓
1. Reliability provisions?			
2. Utilized preferred or commonly used components?			
3. Provide fabrication and as-built drawings?			
4. Provide operating instructions?			
5. Safety provisions?			
6. Meet intended use and foreseeable misuse?			
7. Provide interlocks/safety devices?			
8. Operation and maintenance provisions?			
9. Simple operations?			
10. Understandable and operable controls?			
11. Spare parts availability?			
12. Environment effects of:			
a. Extremes of service voltages?			
b. Extremes of service water hardness?			
c. Extremes of service pressure?			
d. Extremes of service temperature?			
e. Extremes of external vibration?			
f. Extremes of external shock?			
g. Extremes of ambient temperature?			
h. Extremes of humidity?			
i. Foreign material (sand, grit, oil, lint, dirt, etc.)?			
j. Corrosive ambients (water, acids, etc.)?			
k. Extremes of external magnetic fields?			
l. Weather extremes?			
m. Radio interference?			
n. Nuclear radiation?			
o. Supplementary products (detergents, bleaches, oils, grease, etc.)?			

DESIGN REVIEW CHECKLIST

	YES	NO	N/A
13. Effect on environment of:			
a. Appearance?			
b. Noise?			
c. Odor?			
d. Temperature?			
e. Vibration?			
f. Light?			
g. Radiation?			
h. Exhaust?			
i. Space?			
j. Packaging disposal/recycle?			
k. Final product disposal/recycle?			
1. Material content?			
2. Hazardous materials?			
3. Lubricants?			
14. Human engineering factors?			
15.			
16.			
17.			
18.			
F. FAILURE			
Does the design account for failure modes?			
1. Failure modes identified?		✓	
2. How failures detected?			✓
3. Compensating factors for failures?			✓
4. Recovery from failures?			✓
5. Repairable?			✓

Action Item 3

DESIGN REVIEW CHECKLIST

	YES	NO	N/A
6. Is a Failure Mode and Effect Analysis needed?			✓
7.			
8.			
9.			
G. RELIABILITY			
Does the design meet reliability requirements?			
1. Maximum stresses within limits through full range of travel, load, voltage, etc.?			✓
2. Derating utilized?			✓
3. Simplicity optimized?	✓		
4. Failure modes of critical elements analyzed?			✓
5. Optimum use of standard proven parts?	✓		
6. Correct current problems and complaints?	✓		
7. Similar design data considered?			✓
8. Allowable stresses per (XXXXX)?			✓
9.			
10.			
11.			
H. MATERIALS			
Does the design meet materials requirements?			
1. Allowable materials for specific function and (XXXXX)?			✓
2. Prohibited materials per (XXXXX)?			✓
3. Corrosion resistance?	✓		
4. Cleanliness requirements?			✓
5. Galling?			✓
6. Surface wear?			✓

DESIGN REVIEW CHECKLIST

	YES	NO	N/A
7. Electrical/bearing/lubricants, etc. per (XXXXX)?			✓
8.			
9.			
10.			
I. INTERFACES			
Does the design comply with facility interface requirements?			
1. Will it fit through doors and openings?	✓		
2. Will it require support equipment and utilities?	✓		
3. Is there adequate visibility of operation?	✓		
4. Is there operation access?	✓		
5. Protection for fire, water space?			✓
6.			
7.			
8.			
J. MANUFACTURING			
Does the design minimize manufacturing problems by:			✓
1. Utilizing existing equipment for fabrication, finishing, assembly, calibration, testing, packaging, etc.?			
2. Utilizing more efficient new processes, equipment, and facilities?			
3. Avoiding hazardous operations?			
4. Optimizing tool/piece costs?			
5. Permitting maximum standardization?			
6. Specifying tolerances consistent with acceptable processes and equipment?			
7. Correcting or avoiding previous or current manufacturing problems?			
8. Minimizing operations requiring special skills or special attention?			

DESIGN REVIEW CHECKLIST

	YES	NO	N/A
9. Clearly identifying critical parameters to be controlled during the procurement and manufacturing cycle?			
10. Specifying materials conforming to standards?			
11. Being clearly and completely described on drawings?			
12.			
13.			
14.			
K. QUALITY ASSURANCE			
Does the design provide for testing and quality assurance?			✓
1. Inspection and testing of fabrication?			
2. Functional tests?			
3. Load tests?			
4. Special tests?			
5. Supplier test specification?			
6. Test documentation?			
7. Acceptance criteria?			
8. Westinghouse inspection?			
9. Post installation tests?			
9. Post installation tests?			
10. Records and certifications?			
11.			
12.			
13.			
L. INSTALLATION			
Does the design consider installation requirements?			✓
1. Is weight and size compatible with lifting equipment?			

DESIGN REVIEW CHECKLIST

	YES	NO	N/A
2. Are there lifting and handling aids?			
3. Center-of-gravity identified?			
4. Vendor responsibilities defined?			
5.			
6.			
7.			
M. PACKAGING			
Does the design minimize packaging, shipping, handling, and warehousing problems by:			✓
1. Utilizing standard packaging?			
2. Minimizing offsets, projections, etc. which require additional packing material?			
3. Withstanding applicable transportation tests?			
4. Considering shipping and warehousing environment?			
a. Shock?			
b. Vibration?			
c. Temperature extremes?			
d. Humidity extremes?			
e. Handling equipment?			
f. Sand and dust?			
5. Permitting shape and size of packaged product which would optimize rail car and truck loading?			
6. Providing clear handling instructions on outside of packaging?			
7. Considering disposal of used packaging material?			
8.			
9.			
10.			

DESIGN REVIEW CHECKLIST

	YES	NO	N/A
N. LAWS AND SPECIFICATIONS			
Does the design comply with applicable laws and agency requirements?			
1. Does the product comply with applicable laws and agency requirements?			✓
a. State laws?	✓		
b. Federal laws?			✓
2. Does the product comply with applicable agency standards or guidelines?			
a. Underwriters' lab?	✓		
b. OSHA?	✓		
c. ANSI?			✓
d. DOE?	✓		
e. NEMA?			✓
f. NEPA?	✓		
g.			
h.			
i.			
3. Local requirements?			
a. Radiological Controls?	✓		
b. Nuclear Safety?	✓		
c. Lifting and Handling?	✓		
d. Safety?	✓		
e. Fire Protection?			✓
f.			
g.			
h.			
i.			

APPENDIX C

**K BASIN DOSE REDUCTION PROJECT
PRELIMINARY DESIGN REVIEW**

COMMITTEE MEMBERS

L. D. Blackburn	Chairman
R. E. Breedlove	ICF KH Construction Forces
W. H. Cloos	Operations
J. I. Diehl	Operations Quality Assurance
W. A. Frier	Engineering (Design Authority)
R. G. Gant	Environmental
D. O. Hess	Operational Safety
W. J. Millsap	ALARA

APPENDIX D
Review Comment Records

REVIEW COMMENT RECORD (RCR)	1. Date 12/14/95	2. Review No.
	3. Project No. A.8	4. Page 1 of 2

5. Document Number(s)/Title(s) K-Basins Dose Reduction Project A.8 "Preliminary Design Review"	6. Program/Project/ Building Number SNF	7. Reviewer JI Diehl	8. Organization/Group SNFPQA	9. Location/Phone 100K 1719 Bldg 373-4734
--	---	-------------------------	---------------------------------	--

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	Date 1-17-96	Reviewer/Point of Contact <i>J.I. Diehl</i> J.I. Diehl
	Author/Originator <i>Tom C. Fozell</i> Tom C. Fozell	Reviewer/Point of Contact
		Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
D-2 Gen	I realize that I do not have all of the back ground information since I was just put on this project last week, but why are we doing a preliminary design review on a project that's been roughly half completed?		This is a 50% PDR.	CLOSED

REVIEW COMMENT RECORD (RCR)	1. Date 12/14/95	2. Review No.
	3. Project No. A.8	4. Page 2 of 2

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1.	Specific to coatings: per W-S-0375: have not found where Oceaneering addresses cracks, ledges and holes after surface preparations.	JID	<p style="text-align: center;">ACCEPTED</p> <p>The intent of this requirement was to address damage caused by aggressive methods for cleaning concrete (e.g. scabbling or scarification) that have the potential to cause damage to the basin wall.</p> <p>The coating material proposed by Oceaneering requires only a light superficial cleaning via light brushing and damage is not anticipated. However the cleaning method will be verified prior to deploying the equipment into the basin.</p> <p>ECN 190566 will revise the Specification to reflect this method of cleaning.</p>	OPEN
2.	Question on the SOW: Submittals, I don't see a schedule as to when the submittals are required.	JID	<p style="text-align: center;">ACCEPTED</p> <p>The schedule for document submittals where required in the Request for Proposals.</p>	CLOSED <i>JH</i>
3.	Did we specify what the vendors QA manual/program was supposed to meet?	JID	<p style="text-align: center;">ACCEPTED</p> <p>No, (see SOW Section 13) the QA manual was submitted with the vendors response to the RFP. The manual was reviewed for compliance to Hanfords requirements during the RFP evaluation and selection process by R.E. Lacey.</p>	CLOSED <i>JH</i>

D-3

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REVIEW COMMENT RECORD (RCR)	1. Date 12/12/95	2. Review No. 5
	3. Project No. A.8	4. Page 1 of 1

5. Document Number(s)/Title(s) Preliminary Design Review for Raising Water Level in 105 K East	6. Program/Project/Building Number SNF/A.8/105 KE	7. Reviewer W. H. Cloos	8. Organization/Group K Basins Operations	9. Location/Phone 105 KE/372-2853
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17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	Reviewer/Point of Contact <i>W. H. Cloos</i> Date: 1/17/96	Reviewer/Point of Contact Date Author/Originator <i>Jan C. Janett</i>

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Issues number 1.4.3, the north load out pit door leaks, this would flood the old clarifier pumps in the north load out pit.	WHC	ACCEPTED Verification will be conducted to assess the effects on the equipment and components in the pit. The findings will be documented in a preliminary job walk-down.	OPEN
2	Issues number 1.3, Operations would like to see skimmer weirs that would hold throw away nylon bags, to make cleaning the weirs easy.	WHC	ACCEPTED J.M. Kurta is the Design Authority for the skimmer system. C.P. Janett has been identified as the Design Agent in charge of the skimmer weir upgrade/modification task. This comment will be forwarded to them for consideration.	OPEN
3	Verify that the overflow weirs on the north side of the basin are plugged, or above the upper water line limit.	WHC	ACCEPTED Verification will be conducted and documented in a preliminary job walk-down the findings will be disclosed at the FDR.	OPEN A

D-5

MHC-SD-SNF-DRR-004 Rev. 01

REVIEW COMMENT RECORD (RCR)	1. Date 12-08-95	2. Review No. 2
	3. Project No. A.8	4. Page 1 of 2

5. Document Number(s)/Title(s) ECN 190566, WHC-S-0375, ECN 190564, ECN 611951	6. Program/Project/ Building Number Dose Reduction Project	7. Reviewer L. D. Blackburn	8. Organization/Group Mechanisms Engineering	9. Location/Phone ETC-2, 2920 GWW, 376-5888
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17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	Date <u>1/17/96</u>	Date
	Reviewer/Point of Contact <i>L. D. Blackburn</i>	Reviewer/Point of Contact
	Author/Ociginator <i>Jan C. Ford</i>	Author/Ociginator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
D. 6 1	ECN 190566, Continuation Sheet, "Add Section 5.8:": The document ends at Section 5.5; change should be to Section 5.6?	LDB	ACCEPTED Agreed.	OPEN
2	WHC-S-0375 Section 4.1: none of the project documentation reviewed discussed how the ability to repair concrete damaged by cleaning is to be demonstrated. If demonstration is to be provided by Clean and Coat ATP, will the use of dummy concrete panels exhibit the same damage as K Basin concrete?	LDB	ACCEPTED The intent of this requirement was to address damage caused by aggressive methods for cleaning concrete (e.g. scabbling or scarification) that have the potential to cause damage to the basin wall. The coating material proposed by Oceaneering requires only a light superficial cleaning via light brushing and damage is not anticipated. However the cleaning method will be validated prior to deploying the equipment into the basin. ECN 190566 will revise the Specification to reflect this method of cleaning.	OPEN

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Rev. 0

REVIEW COMMENT RECORD (RCR)	1. Date 12-08-95	2. Review No. 2
	3. Project No. A.8	4. Page 2 of 2

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
3	ECN 190564, Description of Change: The project documentation reviewed did not require demonstration that walls be "cleaned of scums, scales, dirt, water deposits, and biological growth." The drawing change should better note "...cleaned by wire brushing."	LDB	ACCEPTED The cleaning requirements are specified in WHC-S-0375 Section 4.0, which will be revised to reflect the cleaning method proposed. ECN 190564 will be revised to reference the specification for these requirements.	OPEN
4	ECN 190564, Description of Change: The description of the Clean and Coat Task given at the briefing indicated that the clean and coat area would begin a few inches above the water line (2" I think), rather than at the water line as indicated in the ECN.	LDB	ACCEPTED ECN 190564 will be revised to reflect the tolerance of 1/2" to 2" above the existing water line. Project documentation will also be revised to reflect this change.	OPEN
5	ECN 190564, Justification: in the third sentence, change to "The cleaning and sealing of the concrete walls, followed by raising the water level, will result...:	LDB	ACCEPTED Agreed.	OPEN
6	ECN 611951, Description of Change: same comments as 3 and 4.	LDB	ACCEPTED Consideration is being giving to left in place SST concrete forms that would not require coating, the existing concrete in the tech view pit is already coated. ECN 611951 will be revised to reflect this new concept.	OPEN
7	ECN 611951, Justification: change to "Extension of concrete wall is required to raise water level for engineered reduction in radiation dose to workers."	LDB	ACCEPTED Agreed.	OPEN

0-7

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Rev. 3

REVIEW COMMENT RECORD (RCR)

1. Date 12/14/95	2. Review No. 1
3. Project No. A.8	4. Page 1 of 1

5. Document Number(s)/Title(s) Preliminary Design Review	6. Program/Project/ Building Number SNF/Dose Reduction/KE-105	7. Reviewer R. L. Simons	8. Organization/Group Nuclear Physics and Shielding	9. Location/Phone 3200GWW/376-8244
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17. Comment Submittal Approval: _____ 10. Agreement with indicated comment disposition(s) 11. CLOSED

Organization Manager (Optional) _____ Date 1/16/96 Reviewer/Point of Contact *Robert L. Simons* Reviewer/Point of Contact _____

Author/Originator *Ray C. Ford* Author/Originator _____

8-8

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	No discussion of vacuumed waste or the estimate of rate of accumulation of radioactive debris.	RLS	ACCEPTED The projects Waste Plan will document these estimates, and will be available for review at the FDR.	OPEN
2	Will there be adequate view of the coating to determine if it is being applied uniformly and of adequate thickness?	RLS	ACCEPTED A vision and lighting system will provided with the clean and coat equipment to monitor the application. Details regarding the system and the criteria for determining the coatings adequacy will be provided at the FDR.	OPEN

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)	1. Date December 13, 1995	2. Review No.
	3. Project No. A.8	4. Page 1 of 3

5. Document Number(s)/Title(s) Dose Reduction Project Preliminary Design Review	6. Program/Project/ Building Number K Basin Dose Reduction	7. Reviewer R.G.Gant	8. Organization/Group K Basins Standards and Requirements	9. Location/Phone MO-401/22 373-3781
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17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	Date 1/17/96	Reviewer/Point of Contact <i>R.G. Gant</i>
	Author/Originator <i>Ray C Ford</i>	Reviewer/Point of Contact
		Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Some of the supporting documentation (e.g., F&R, PMP, CDRR) provided did not include the EDT sign off sheets, so it is difficult to ascertain who actually reviewed the documents.	RGG	ACCEPTED EDT's will be included with the controlled documents at the Final Design Review.	CLOSED
2	The Project Management Plan indicates in Figure 2 that an Environmental approval is required for the F&R document. Yet, the F&R document title page indicates an impact level of "SQ", i.e., no "E". (See also comment no. 1)	RGG	ACCEPTED The Project Management Plan is being reviewed by the Regulatory Compliance Organization, this review will determine the K Basin required signatures.	CLOSED
3	"Raise the Water Level Issues" document states in section 2.2 that "NOC authorizes wall cleaning...". In fact, the NOC only authorizes cleaning by the use of a high pressure water jet. Alternate cleaning processes are not yet approved by DOH and must be brought to their attention and be approved prior to the start of work.	RGG	ACCEPTED Brushing has been approved by the WDOH on 1/9/96.	CLOSED

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
4	The documentation does not address whether coating without any cleaning has been considered. Such a process would be extremely attractive in that lower costs and lower doses would be incurred.	RGG	ACCEPTED Oceaneering has provided justification for the cleaning method selected in their response to the RFP (page 2-7). Provisions have been provided in the Clean and Coat Specification (WHC-S-0375, 4.6) to waive this requirement if the vendor can demonstrate that surface preparation is not required.	CLOSED
5	The Decon and Seal specification, WHC-S-0375, paragraph 6.1 requires the sealant shall be able to withstand periodic cleaning with wire brushes or steam. 5.a.) Is it realistic to expect the coating to meet this requirement, especially for the wire brushes? 5.b.) Is the requirement necessary for these two processes? A satisfactory coating would seem to not need such an aggressive cleaning process to be able to be decontaminated. 5.c.) Steam cleaning would seem to be an unlikely cleaning process that would be used in the basin.	RGG	ACCEPTED 5.a) Yes, The WPPSS report rated Bio-Dur as "Best material tested.", and in a Tel-Con with R. F. Creed and Don A. Hill, author of the WPPSS report, Don reiterated that Bio-Dur is a top quality product better than any others they have used or tested. 5.b) No, However the Vendor has proposed a coating that can withstand the cleaning processes required in the specification. 5.c) Agreed.	CLOSED

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
6	<p>The Statement of Work document has conflicts in section 9.3.4.11. DAC values at K Basins are applied by assuming all alpha activity is Pu-239 and all beta-gamma activity is Sr-90. There are published values in 10 CFR Part 835 for Pu-239 (alpha) and Sr-90 (beta-gamma) that become our "DAC limits". Clarification is needed in whether the requirement is to meet these DAC levels or ten percent of these DAC levels. I believe the intent of the last sentence is that air quality shall be maintained below 10 percent of the DAC limits as applied at K Basins.</p> <p>The requirement does not specify the area of measurement. If the exhaust air from the basin approaches 10 percent of DAC levels it will not be acceptable. On the other hand, this requirement would be suitable in the immediate work area of the clean/coat equipment.</p>	RGG	<p style="text-align: center;">ACCEPTED</p> <p>SOW 9.3.4.11 will be revised and made available prior to the FDR.</p>	OPEN

D-11

REVIEW COMMENT RECORD (RCR)	1. Date 14 Dec 95	2. Review No. 95-XXX
	3. Project No. A.8	4. Page 1 of 1

5. Document Number(s)/Title(s) Clean & Coat System design review. Dose Reduction A.8	6. Program/Project/ Building Number 105-KE	7. Reviewer Dave O. Hess	8. Organization/Group SNF Safety	9. Location/Phone 1719-K X3-80/ 3-1767
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17. Comment Submittal Approval: Organization Manager (Optional) _____	10. Agreement with indicated comment disposition(s) Date <u>1/16/96</u>	11. CLOSED Reviewer/Point of Contact <u>David O. Hess</u> Date _____ Author/Originator <u>Joe C. Ford</u>	Reviewer/Point of Contact _____ Date _____ Author/Originator _____
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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1.	The statement of work and/or the Decon & Seal specification should have a criteria statement saying that rotating/moving parts shall be guarded/protected per OSHA criteria and Electrical components shall be UL or FM listed.	DOH	ACCEPTED The SOW, Section 3.0 (OSHS Title 29, CFR Labor Part 1910) specifies the machine guarding requirements. WMC-S-0375, Section 3.0 (DOE-RL-6430.1A Section 16) covers the electrical requirements for Hanford.	CLOSED
2.	There is a potential criticality safety issue/what if relating to failure of the equipment and dropping all or part of the equipment into the basin on the stored fuel.	DOH	ACCEPTED This is covered by previous analyses for fuel/canister drops and was revisited for proposed core drilling of the basin walls project. A letter will be obtained from the K-Basin Criticality Safety Representative indicating that this accident is bounded by existing documents.	OPEN
3.	There is an additional crit. safety concern (as well as a potential water chemistry concern) relating to a potential spill of the BIO-DUR 560 materials (either as the final product mix or its preliminary components) into the basin water. This potential spill raises two questions: are any of the components or final product more neutronically reactive than water; and what is the effect of any spilled final product on canister cleaning and fuel recovery? Also, would a spill of the precursor materials create a basin water chemistry problem (e.g. cause filter clogging, IXM blinding, etc.)?	DOH	ACCEPTED Steve Burke will evaluate the coating material and document his findings. The USQ screening and Hazard Classification will evaluate and document potential accident scenarios, including the effects of spilled coating material on the open fuel and canisters.	OPEN

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REVIEW COMMENT RECORD (RCR)	1. Date 12/18/95	2. Review No.
	3. Project No. A.8	4. Page 1 of 4

5. Document Number(s)/Title(s) Dose Reduction Project Preliminary Design Review	6. Program/Project/ Building Number K Basin Dose Reduction	7. Reviewer W. J. Millsap	8. Organization/Group Dose Reduction Projects ALARA	9. Location/Phone MO-293/376-3676
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17. Comment Submittal Approval: Organization Manager (Optional) _____	10. Agreement with indicated comment disposition(s) 1/15/96 Date	11. CLOSED William J. Millsap Reviewer/Point of Contact Ray C. Ford Author/Oriinator	12. _____ Date	13. _____ Reviewer/Point of Contact	14. _____ Date	15. _____ Author/Oriinator
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D-13

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	A determination of the optimized basin static background dose rate needs to be made; this will determine what the end-point of the dose reduction project should be. This determination should be based on these factors: the present estimate of the collective dose to be incurred throughout the project from the static background radiation field; the present monetary value of collective dose (\$30,000/person-rem); and the estimated cost of options to reduce exposure to the background radiation field.	WJM	ACCEPTED A Supporting Document (SD) is being generated that documents the current condition and conditions prior to hydrolysis. This SD serves as the baseline for dose reduction efforts, and will be updated as changes in the ambient conditions occur. After raising the water has been completed, an optimization study, taking into account all project work scheduled to be completed in the KE Basin, will be conducted that will identify options and make recommendations for future dose reduction efforts, based on designs available at that time. This will be completed by June 96.	OPEN
2	All aspects of the dose reduction project should be consolidated under a single point control; if this is not the case, the project may not be well coordinated and the expected dose reduction not achieved.	WJM	ACCEPTED R.F. Creed is the Project Engineer and will ensure the proper coordination of all aspects of the project, including the skimmer wter upgrades.	CLOSED

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REVIEW COMMENT RECORD (RCR)	1. Date 12/18/95	2. Review No.
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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
3	Concerning the skimmer weir upgrades: Bill Mills has experience with a skimmer system at a pool in Idaho, and he was part of the initial look at the K-Basin skimmer system. His knowledge and experience should be used in the designing and installing the upgraded system at K-East.	WJM	ACCEPTED J.M. Kurta is the Design Authority for the skimmer system. C.P. Janett has been identified as the Design Agent in charge of the skimmer weir upgrade/modification task. This comment will be forwarded to them for consideration. The Dose Reduction Project is purchasing the material and fabrication services for this task.	OPEN
4	Concerning the skimmer weir upgrades: A single, comprehensive upgrade should be planned and implemented; an incremental upgrade path would likely result in needless radiation dose received.	WJM	ACCEPTED See comment disposition 3.	OPEN
5	Concerning the skimmer weir upgrades: It would reduce the installation dose if, consistent with a useful upgrade, as much of the old system as practical is used.	WJM	ACCEPTED See comment disposition 3.	OPEN
6	Concerning the skimmer weir upgrades: Consider using a floating system that skims the small stuff off the surface augmented with a plan to fish out the larger objects with a pole.	WJM	ACCEPTED See comment disposition 3.	OPEN

D-14

REVIEW COMMENT RECORD (RCR)	1. Date 12/18/95	2. Review No.
	3. Project No. A.8	4. Page 3 of 4

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
7	Concerning the cartridge filter pit dam: Consider using a stainless steel form to pour a concrete dam; this form would be left in place after the concrete cures. This would make a stronger dam and would reduce the installation dose since the form will not have to be removed. An initial review by Kaiser construction, Basin radcon, Basin ALARA, and project ALARA showed this to be the best option (of the three proposed).	WJM	ACCEPTED ECN 611951 will be revised to reflect the concept described in this comment.	CLOSED
8	Concerning the cartridge filter pit dam: If a concrete dam is poured, the concrete scabbling and hole drilling need to be done without respirators if at all possible in order to keep the collective dose down. (HEPA-filtered concrete scabbling tools are available from Nilfisk and Pentex.)	WJM	ACCEPTED Engineered controls, if at all practical, will be used to reduce or eliminate the use of respiratory protection. Methods considered will be reviewed, evaluated, and documented in the ALARA planing.	OPEN
9	Concerning the cartridge filter pit dam: Kaiser needs the time and opportunity to practice with any new tools (such as scabblers) before doing the basin work.	WJM	ACCEPTED Training will be provided on the use of tools, equipment, and methods that are not familiar to the crafts and operators prior to commencing in basin work activities.	OPEN
10	Concerning the cartridge filter pit dam: If a concrete dam is poured, try to find a concrete-to-concrete bonding agent that does not require the use of a mask for chemical protection purposes.	WJM	ACCEPTED A practical effort will be made to find a bonding agent that will not require a mask.	OPEN

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REVIEW COMMENT RECORD (RCR)		1. Date	2. Review No.
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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
11	Concerning the cartridge filter pit dam: There are some hot pipes nearby and some thought needs to be given to shielding.	WJM	ACCEPTED Additional temporary shielding will be installed, if it is cost effective to do so, to keep the radiological dose rate ALARA. The details will be reviewed, approved, and documented in the safety and ALARA reviews of the project.	OPEN

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APPENDIX E

ACTION ITEM LIST

1. Revise ECNs 190564, 190566, and 611951 to reflect current cleaning method in the revised specification and drawings.
2. Revise ECN 611951 to incorporate the structural analysis of the cartridge filter pit wall modification.
3. Revise structural analysis calculations for the cartridge filter pit wall modification to include a case for damage to concrete reinforcing bar during drilling.
4. Revise the Statement of Work to include the dummy elevator pit in the scope.
5. Revise ECNs 190564 and 611951 to reflect:
 - (a) coating will be applied only to within 1/2 to 2 inches of the current water level;
 - (b) editorial changes in Justification sections.
6. Conduct preliminary job walk-down to assess effects of leaks in north load out pit doors on equipment and components in pit.
7. Conduct preliminary job walk-down to verify that overflow weirs on the north side of the basin are plugged or that they are above the upper water level limit. Provide documentation of walk-down for final design review.
8. Forward all comments on skimmer weirs to the Design Agent for skimmer weir upgrade/modification task.
9. Include estimates of vacuum waste and accumulation of radioactive debris from wall cleaning in project Waste Plan document.
10. Include a vision and lighting system in the clean and coat equipment, and provide criteria for determining adequate uniformity and thickness of coating.
11. Revise section 9.3.4.11 of the Statement of Work to clarify requirements for air quality.
12. Provide a letter from K-Basin Criticality Safety Representative indicating that an accident in which clean and coat equipment is dropped into the basin on the stored fuel is bounded by existing safety documentation.
13. Evaluate potential spills of coating material into the basin on: (a) neutronic reactivity, (b) canister cleaning and fuel recovery, and (c) water chemistry problems that could impact filters, ion exchange, etc.

14. The optimized basin static background dose rate to define what the end-point of the dose reduction project should be. This determination should be based on the following factors:
 - (a) The present estimate of the collective dose to be incurred throughout the project from the static background radiation field;
 - (b) The present monetary value of collective dose (\$30,000/person-rem);
 - (c) The estimated cost of options to reduce exposure to the background radiation field.

15. For construction of the cartridge filter pit wall modification:
 - (a) Conduct any concrete scabbling or hole drilling required without respirators if at all possible;
 - (b) Provide worker training for use of new tools (e.g. scabblers);
 - (c) Use concrete-to-concrete bonding agent that does not require mask for protection from chemical agents, if possible;
 - (d) Provide radiation shielding for nearby hot pipes, if justified by cost-benefit analysis.

All action items are the responsibility of WMC Dose Reduction Project and are to be completed before February 28, 1996, except for Item 14, which will be completed by June 1996.

APPENDIX F
Design Review Briefing Graphics

PRELIMINARY DESIGN REVIEW RAISING WATER LEVEL IN 105 K EAST BASIN

December 6, 1995

Functions and Requirements, Specification

- Functions and Requirements changes
 - Raise water section requirements section added
 - Add requirement on testing hydraulic fluid/IXM compatability
 - Detail for 10 year warranty
 - Details on handling shielding
- Specification
 - Detail for 10 year warranty
 - Time limitation between cleaning and painting eliminated
 - Coating must be "concrete grey"

PDR December 6, 1995

Basin Resources

- Pit wall construction (February 1996)
 - Kaiser CF estimate in progress
 - Operations, primarily escort
 - Health physics, intermittent coverage
 - Maintenance, none
- Cleaning and Painting (March-April 1996)
 - Kaiser CF, 2 painters in basin, associated laborers
 - Operations, escort
 - Health physics, intermittent coverage
 - Maintenance, none
- Skimmer wiers (in progress, TBD)
 - Operations, Escort, system shut down and start-up
 - Maintenance, Equipment removal and installation
 - Health physics, intermittent coverage
- Weasel Pit Isolation Screen (in progress, TBD)
 - Kaiser CF, Equipment removal and installation
 - Operations, Escort
 - Health physics, intermittent coverage
 - Maintenance, Equipment removal and installation

PDR December 6, 1995

Project Considerations

- Clean and Paint Equipment contract placed (11/14/95)
- Estimate by Kaiser CF for wall modification in progress
- Concept designs for wall modification in progress
- Preliminary Design Review for cleaning and coating equipment
- Preliminary Design Review for raising water level
- SAR change complete
- OSR change in progress
- PFWR for painting walls complete -- CF
- Issue resolution in progress -- see attachment

PDR December 6, 1995

Cost Benefit Analysis

- Operator dose anticipated 660 man-rem (Eacker Rpt)
- Operator dose after raising water 330 man-rem (Eacker Rpt)
- Cost Benefit
 - Project cost ~\$3K/man-rem saved
 - @\$30K/man-rem, \$10M is cost effective
- Others in basin will decrease the cost per man rem saved

Interfaces

- K Basin structure affected
- Water level alarm
- Coordinate with cartridge filter changeout
- Fuel Characterization
- Debris Removal
- Skimmer Wiers
- Weasel Pit isolation screen

APPENDIX G

K BASIN DOSE REDUCTION PROJECT
PRELIMINARY DESIGN REVIEW

MEETING MINUTES

The Preliminary Design Review Meeting for the K Basin Dose Reduction Project was held on January 4, 1996 in the M0293 conference room at 2 p.m. Those in attendance were:

- *L. D. Blackburn, Chairman
- *W. J. Millsap
- *W. H. Cloos
- *R. G. Gant
- *W. A. Frier
- *J. I. Diehl
- R. F. Creed
- M. T. Husain
- J. C. Fordham

* Committee members

The agenda for the meeting was review of all comments and dispositions documented on Review Comment Record (RCR) forms and completion of the design review checklist. The final RCRs resulting from meeting discussions and the completed design review checklist will be included in the design review report.

Discussions of the comments did not reveal any major items of concern. Review of proposed dispositions led to some minor changes in wording. The conclusion of the committee was that the existing documents are an acceptable basis for proceeding to complete the action items and the designs.

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