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CSER 90-006, ADDENDUM 1: CRITICALITY SAFETY CONTROL FOR SOURCE TERM REDUCTION IN SCRUBBER GLOVEBOX OF BUILDING 232-Z		ECN No. N/A

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ENGINEERING DATA TRANSMITTAL

1. EDT No. 610635

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Plutonium Finishing Plant	Criticality and Radiological Analyses	112870
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
PFP	D. E. Friar	N/A
8. Originator Remarks: Transmittal of Criticality Safety Evaluation Report 90-006, Addendum 1, for review and approval		**9. Equip./Component No.:** N/A
		10. System/Bldg./Facility: 232-Z
11. Receiver Remarks:		**12. Major Assm. Dwg. No.:** N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date:

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
	WHC-SD-SQA-CSA-20390		0	CSER 90-006, Addendum 1,	S	1,2		
				Criticality Safety Control				
				for Source Term Reduction				
				Project in the Scrubber				
				Glovebox of Building 232-Z				

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp.	(J) Name (K) Signature (L) Date (M) MSIN	(J) Name (K) Signature (L) Date (M) MSIN	(G) Reason	(H) Disp.
1		Cog.Eng. DE Friar DE Friar 2/2/95 H4-64	OSTI (2) 45.07		
1		Cog. Mgr. RL Ramble 2/3/95 H4-64			
		QA N/A			
1		Safety SE Nunn 2/8/95 56-70			
		Env. N/A			
1		Tech Review: EM Miller EM Miller H4-64			
1		Crit. Safety Rep. LT Nirider 2-06-95 T5-53			

18.	19.	20.	21. DOE APPROVAL (if required) Ltr. No.
D.E. Friar DE Friar 2/2/95 Signature of EDT Originator Date	L.H. Rodgers 2-7-95 Authorized Representative for Receiving Organization Date	A. L. Ramble 2/3/95 Cognizant/Project Engineer's Manager Date	[] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (07/91) GEF097

RELEASE AUTHORIZATION

Document Number:	WHC-SD-SQA-CSA-20390, Rev. 0
Document Title:	CSER 90-006, Addendum 1: Criticality Safety Control for Source Term Reduction in Scrubber Glovebox of Building 232-Z
Release Date:	2/17/95

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

V.L. Birkland 2/17/95

V.L. Birkland

SUPPORTING DOCUMENT

1. Total Pages 5

2. Title	3. Number	4. Rev No.
CSER 90-006, ADDENDUM 1: CRITICALITY SAFETY CONTROL FOR SOURCE TERM REDUCTION PROJECT IN THE SCRUBBER GLOVEBOX OF BUILDING 232-Z	WHC-SD-SQA-CSA-20390	0

5. Key Words	6. Author
SOURCE TERM REDUCTION, 232-Z INCINERATOR FACILITY, SCRUBBER GLOVEBOX	Name: D. E. Friar Signature Organization/Charge Code 8M400/XR5067

7. Abstract

This Criticality Safety Evalution Report addendum extends the coverage of the original CSAR (90-006) about dismantling the ductwork in 232-Z to include cleanout of the Scrubber Glovebox, with an estimated residual Pu holdup of less than 200 grams. The procedures for keeping any materials inside or removed dry is retained as part of the qualification as a Limited Control Facility.

8. RELEASE STAMP

OFFICIAL RELEASE BY WHC
DATE FEB 21 1995
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ADDENDUM 1 TO CSER 90-006

Title: CRITICALITY SAFETY CONTROL FOR SOURCE TERM REDUCTION PROJECT IN THE SCRUBBER GLOVEBOX OF BUILDING 232-Z

Prepared by: _____ Date: 2/1/95
Engineer, Criticality & Radiological Analysis

Reviewed by: Edward M. Miller Date: 2/1/95
Engineer, Criticality & Radiological Analysis

Approved by: _____ Date: 2/3/95
Manager, Criticality & Radiological Analysis

Since December of 1987, building 232-Z has been classified as a Limited Control Facility which requires that the form and distribution of the fissile material be controlled so that a criticality accident cannot occur. Primarily the control has been met by prohibiting the addition, removal, or rearrangement of fissile material in the facility. In CSER 90-006, some cleanout of the facility ductwork was authorized on the basis of special procedural controls. Cleanout of the scrubber glovebox is similar work and requires only slight modification of the requirements already established in CSER 90-006. For the scrubber glovebox cleanout, the operating organization needs to ensure that:

1. Before beginning work that could disturb the fissile material from its current configuration, there must be verification that the materials are essentially dry. Testing and/or evaluation shall show that not more than 0.5 liter of liquid could be present in the "section" to be dismantled. For purposes of the scrubber glovebox, the "section" would refer to elements such as the equipment piece, glovebox floor section, filter box, length of piping, catch basin, or sump. The intent of the requirement is to prevent more than a total of 0.5 liters of liquid from accumulating in one area in the event of a spill, and to prevent the application of paints to fix and remove contamination. If the use of Butvar or similar vinyl based paint is necessary, another addendum to the CSER will be needed.

2. The project is to be planned so that the total amount of fissile material contained in the scrubber glovebox and process equipment involved is less than 425 grams (as determined by the most recent NDA measurements). The discovery of unexpected fissile material

accumulations (in excess of 425 grams) will not violate this planning requirement if work is stopped until a revised plan is developed and approved. Since the scrubber glovebox is estimated to contain less than 200 grams fissile (see attached Compilation of NDA Results), this addendum does not include the work "phase" provision of CSER 90-006.

3. At least two physical barriers and/or administrative controls and procedures shall be included to prevent water access into the fissile material deposits in the scrubber glovebox or in the removed materials. Examples include

   - o Blanking and draining the fire sprinkler line to 232-Z building above and around the scrubber glovebox.
   - o A greenhouse which houses the dismantling and segmenting operations and glovebags used around unbolting or sawing activities is to exclude fire-sprinkler water access to fissile material. It is recommended that a non-hydrogenous fire extinguisher be available inside the greenhouse to handle potential fires in the plastics caused by sawing sparks or other activities.
   - o During the removal of piping segments or equipment, the removed fissile material is contained. Typically, sealed plastic bags or metal containers are used for this purpose. Accumulations or minor spillage due to sawing through deposits can be swept into a 1/2-liter jar or can which is then sealed.
   - o The double wrapping and sealing of the removed glovebox equipment or piping segments for contamination control, before transfer out of the greenhouse and out of 232-Z. Double wrapping is to meet the requirements of Section G, "Use of Plastics" in CPS-Z-165-80010 (GENERAL LIMITS), to prevent critically unfavorable shapes as much as possible.
   - o A CPS limit for the project which forbids the addition of liquid (with the exceptions of that contained in the paste used for sawing lubrication and in wrung-out damp rags used for cleanup).

The scrubber glovebox is near but not connected to the incinerator glovebox. Because the incinerator glovebox is subject to another set of strict inspection and cleanout requirements, an additional requirement is needed: The scrubber cleanout activity must not dislodge, relocate, or moderate the fissile material in the incinerator glovebox.

Duct removal work done as part of the scrubber glovebox cleanout should be conducted in accordance with the existing CSER 90-006.

Spillage of fissile material into plastic containment bags or sleeves is to be controlled by the application of Section G, "Use of Plastics" in CPS-Z-165-80010 (GENERAL LIMITS). Handling and storage of packages produced by the cleanout operations are conducted in accordance with CPS-Z-165-80330, "200 Gram Storage Limit for Nonapproved Containers".

It is noted that the CPS for the operations should include controls requiring that each package of waste transferred out of 232-Z contains no more than 200 grams fissile. This assures compliance with CPSs applicable for handling and/or waste packaging operations involved in their disposition.

To exclude water fire category C is appropriate, with the additional restriction that fire sprinklers are to be blanked and drained.

The glovebox limit of 200 grams fissile is less than 45% of the minimum critical mass for Pu-239 under ordinary (water moderated) conditions, and less than the plastic moderated plutonium minimum critical mass of about 360 grams Pu. Thus both moderation and overbatching would be required before criticality is possible. Conservatism includes no allowance for Pu-240 or other absorbers, less than optimum density or concentration, less than optimum geometry, and less than full water reflection. Further justification for the limits in this addendum is provided in CSER 90-006. It is noted that the 200 gram fissile mass estimate for the scrubber glovebox is much less than the 600 grams fissile analyzed for the ductwork in CSER 90-006. This is judged to compensate for the lack of pipe diameter restrictions found in the original basis.

REVIEWER'S COMMENTS

E. M. Miller of Criticality and Radiological Analysis did an independent, technical review of this addendum to CSER 90-006. The reviewer agrees that for a loading of less than 200 grams of plutonium that cleanup of the Scrubber Glovebox is safe from inadvertent nuclear excursions regardless of the fissile materials form or distribution or of water addition. The limits and restrictions including water exclusion add to the safety margin and are appropriate when the quantity of fissile material is determined by NDA methods. The reviewer's suggestions were incorporated into the addendum.

Compilation of NDA results for 232-Z process equipment

The assay values listed below are the result of measurements performed during June, July and August 1994. The list was compiled as the result of a conversation with Cheryl Stallbaum and Don Sorenson on October 14, 1994.

The equipment listed below does not include the Burning Hood. The measured value for the Burning Hood is being determined by NDA.

Equipment ID	Best Value	Low Value	Most Value
Feed Hood	23	1	70
Conveyor	43	18	86
Ash Hood	16	0	39
Pipe below Ash Hood	7	3	12
Cyclone separators	101	60	156
Canning Hood	6	0	19
Scrubber Cell	148	119	171
Filter Box #1	1	0	1
Filter Box #2	2	1	3
E-4 Exhaust Lines	49	32	70
	=======	=======	=======
	396	234	627