

R. J. Tuttle

 Rockwell International Atomics International Division	SUPPORTING DOCUMENT	NUMBER N704TP990008	REV LTR/CHG NO. A <small>SEE SUMMARY OF CHG</small>
---	----------------------------	------------------------	---

PROGRAM TITLE Decontamination and Disposition of Facilities	DOCUMENT TYPE Test Plan
DOCUMENT TITLE Radiological Survey Plan, Support of D&D Program Operations at T-143 (SRE)	KEY NOUNS D&D Radiological Safety, SRE

ORIGINAL ISSUE DATE 11-5-75

GO NO. 07704	S/A NO. 20300	PAGE 1 OF 15 TOTAL PAGES REL. DATE 9-15-81
-----------------	------------------	---

PREPARED BY/DATE R. K. Owen	DEPT 779-210	MAIL ADDR T-143
--------------------------------	-----------------	--------------------

IR&D PROGRAM? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES, ENTER TPA NO. _____		SECURITY CLASSIFICATION (CHECK ONE BOX ONLY)		(CHECK ONE BOX ONLY)	
UNCL <input checked="" type="checkbox"/>	ERDA <input type="checkbox"/>	DOD <input type="checkbox"/>	RESTRICTED DATA <input type="checkbox"/>	DEFENSE INFO. <input type="checkbox"/>	DATE
CONF. <input type="checkbox"/>	SECRET <input type="checkbox"/>	AUTHORIZED CLASSIFIER	DATE		

APPROVALS <i>[Signatures]</i> R. J. Tuttle M. E. Remley W. F. Heine B. F. Ureda	DATE 11-5-75	APPROVALS <i>[Signatures]</i> A. W. Graves E. G. Andrews J. H. Walter
--	-----------------	---

DISTRIBUTION		
*	NAME	MAIL ADDR
*	R. Aquilera	KB45
*	F. H. Badger	T020
*	S. M. Bradbury	T055
*	C. C. Conners (10)	NB02
*	S. Cunha	T040
*	W. R. McCurnin (4)	T020
*	R. K. Owen (3)	T143
*	M. E. Remley	NB08
*	R. J. Tuttle (3)	NB13
*	B. F. Ureda	NB02
*	J. H. Walter	T009
*	Isotopes Committee (7)	NB13
*	J. C. Blake (2)	KB45

ABSTRACT

Requirements for radiological survey data in support of the decontamination and disposition of the SRE facility (T-143) are described.

RESERVED FOR PROPRIETARY/LEGAL NOTICES

THIS REPORT MAY NOT BE PUBLISHED WITHOUT THE APPROVAL OF THE PATENT BRANCH, ERDA

This report was prepared as an account of work sponsored by the United States Government. Neither the U. S. Government, nor any of its employees nor any of its contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

* COMPLETE DOCUMENT
 NO ASTERISK, TITLE PAGE/SUMMARY OF CHANGE PAGE ONLY

"CLEARED FOR PUBLIC RELEASE BY DOE PATENT COUNSEL NOVEMBER 2011"

REV	SUMMARY OF CHANGE	APPROVALS AND DATE
A	Expanded Table 1, page 4, to include upper limits for soil and concrete contamination. New distribution list.	<p><i>[Signature]</i> C. C. Conners</p> <p><i>[Signature]</i> B. F. Ureda 7-31-81</p> <p><i>[Signature]</i> B. F. Ureda</p> <p><i>[Signature]</i> J. H. Walter</p> <p><i>[Signature]</i> R. Aquilera</p> <p><i>[Signature]</i> REL DATE: 9-15-81</p>

A. Objective

The objective of this plan is to assist D&D program personnel in the decontamination and dismantling of T-143 (SRE) and SRE support facilities for unrestricted use. The SRE support facilities that must be considered as radiologically hazardous are, the west end of T-163 (C.E.R.F.), the sodium service vault, the primary sodium fill/drain tank vault, and the R/A liquid/gaseous waste handling and storage systems located in the hill north of T-143 and adjacent to the west side of T-143.

B. Facility Operating Resume

The operations history of T-143(SRE) may be obtained from Facilities Dismantling Plan - FDP-704-990-003, June 6, 1975, by W. F. Heine and B. F. Ureda.

C. Facilities Contamination History

1. T-143: This facility experienced two primary R/A contamination incidents during the operating history, both of which involved fuel used in Core 1 operations. One was the result of a water/sodium reaction in fuel wash cell "B" during the cleaning operations of a Core 1 fuel element. However, the primary R/A contamination of T-143 High Bay (Reactor Room) occurred during the Core 1 Fuel Recovery program from mid-year 1959 through mid-year 1960.
2. T-163: This facility known as the Contaminated Equipment Repair Facility (C.E.R.F.) became R/A contaminated during the repair of such items as the primary sodium pumps and valves.

3. Sodium Service Vault (T-695) This facility, which is located below grade, is between the primary fill/drain tank vault and the sodium service building (T-153) that housed the new (clean) sodium melt stations and fill tank. The sodium service vault (T-695) contained such items of the primary sodium system as the "cold" trap and two "hot" traps. During the course of reactor operations, several primary sodium leaks and fires occurred within the vault.

4. Primary Sodium Fill/Drain Tank Vault There has been no significant contamination incident involving the sodium fill/drain tank. The primary hazard is high radiation levels. However, some R/A contamination occurred when the man-way cover was separated from the tank after draining primary sodium from the tank into 55 gallon drums.

NOTE: All smear swipe surveys, performed as part of the deactivated SRE facilities surveillance program, have indicated no removable R/A contamination in excess of 5 dpm/100 cm² alpha or 50 dpm/100 cm² beta. The smear swipes were obtained only of the facilities accessible floor areas. However, instrument surveys indicated fixed levels of contamination.

D. Radiological Surveys

All facilities and items within those facilities listed below shall be smeared/instrument surveyed for R/A contamination and/or radiation levels prior to and during dismantling/decontamination operations. All items and facility areas shall not exceed radiation and surface R/A contamination limits stated in Table 1 following completion of the D&D operation.

T-143

Passivation of Residual Primary Sodium in Reactor Core Vessel

1. Vent gas line shall be monitored continuously during passivation operations by in-line sampling procedures. Filter samples shall



be removed and analyzed for R/A concentrations at a frequency of each two hours of operations.

All items and facility areas that exceed those limits stated in Table 1, shall be decontaminated or disposed of as radioactive waste, whichever is more expeditious, economically feasible, and compatible with the D&D program objectives of returning all facilities to unrestricted use.

TABLE 1
UPPER CONTAMINATION LIMITS FOR DECONTAMINATION AND DISPOSITION AT THE SRE

A. Surfaces

Beta Gamma Emitters: Total = 0.1 mrad/h at 1 cm, with 7 mg/cm² absorber
Removal = 100 dpm/100 cm²

Alpha Emitters: Total = 100 dpm/100 cm²
Removable = 20 dpm/100 cm²

B. Soil

Near Surface: 100 pCi/g gross detectable beta activity
Below 3 m (average): 1000 pCi/g gross detectable beta activity
*(maximum): 3000 pCi/g Gross detectable beta activity

C. Concrete (rubble) 100 pCi/g Gross detectable beta activity

*The maximum value may be average over a volume of 1 m³ to meet the limit for the average value.

The radioactivity levels of the facility at completion of the D&D work shall be as low as practicable but shall not exceed limits of Table 1 above. A radiological survey shall be performed upon completion of D&D work to verify this.

The following areas have been identified specifically as requiring radiological surveys prior to work.

1. T-143 (SRE)

- a. Main and auxiliary primary sodium handling systems vault.
- b. Floor/walls of high bay (reactor room)
- c. Pipe trenches - high bay
- d. Fuel storage cells - west end of high bay
- e. Fuel wash cells (3) - northwest end of high bay
- f. Fuel handling machine storage area (Pit)
- g. Fuel handling machines (Mark-I and Mark II)
- h. Overhead bridge cranes - (65 ton and 5 ton)
- i. Moderator can storage cells
- j. All R/A liquid/gaseous waste handling systems located underground, hillside north of T-143 and west side of T-143
- k. Primary sodium pump pit ("Durand's Pit") located between T-143 and fill/drain vault
- l. Moderator can handling machine
- m. Safety and control rod drive motors and storage rack
- n. R/A exhaust system and "hot" cells
- o. Demountable maintenance shield assembly (DMSA). (The well liner was removed during facility deactivation.)

2. T-163 (C.E.R.F.)

- a. Insulation material covering walls and ceiling
- b. 1 ton overhead bridge crane
- c. Floor area of facility (fixed contamination)

3. Primary Sodium Service Vault

- a. Vault walls and floor areas upon removal of sodium handling components, "hot" traps, "cold" trap, etc.

4. Primary Sodium Fill/Drain Tank Vault

- a. Vault walls and floor areas upon removal of primary sodium fill/drain tank.

E. Equipment - (Tools, etc.)

All tools and equipment shall be smear surveyed periodically during operations. No equipment or tools shall be removed from operations area until approved to do so by the Health and Safety representative.

All contractor-owned equipment and tools shall be surveyed prior to end of each work shift or as deemed necessary by the Health and Safety representative. Contractor's work schedule shall be such that the H&S representative will have a minimum of 30 minutes to perform survey and obtain results before contractor personnel leave facility at end of each work day.

F. Forms and Document

1. All radiation/smear surveys shall be recorded on Form 732-A Rev. 8-73; Health and Safety Analysis Report. All liquid, soil, concrete, and air samples shall also be recorded on Form 732-A. Copies of the above report shall be sent to R&NS manager, D&D Program Manager, Operations Manager and on-site H&S files.
2. A Restricted Access Area Entry Permit, Form 719L, Rev. 8-70, shall be issued prior to beginning of operations. One permit may be issued for duration of operation. However, a new permit must be issued if there is a significant change in the operations. Portions of the entry permit shall be filled in by the manager of the group authorizing or performing the work prior to being submitted to the Health and Safety representative.
3. Health Physics Data Request Form is to be filled in by operations personnel to request Health Physics Data for a specific item and/or area.
4. Radiation/Smear Survey Completion Data Form shall be completed by the H&S representative with disposition of item or area to be indicated by operations personnel.

5. Cumulative air sample data form may be used by H&S representative to record results of daily air samples. However, air sample results shall be recorded on Form 732-A as mentioned above.

6. Monthly Dosimeter Record Form shall be used by the H&S representative to record daily radiation exposure levels of personnel to preclude any accidental overexposure.

7. Respirator issuance record form shall be filled in by the H&S representative only, and only in accordance with operating procedure OP-001-870-001, "Control and Use of Respirators."

8. Applicable documents that may be referred to are listed below:
 - a. Operational Safety document - G-27- "Control of Asbestos Operations," E. L. Roddy and W. F. Heine.
 - b. Operating Procedure, OP-001-870-001, "Control and Use of Respirators," J. D. Moore.
 - c. Operational Safety Plan for the AI Decontamination and Disposition of Facilities Program, SRR-704-990-001, Rev. B by J. D. Moore and E. L. Roddy.
 - d. Facilities Dismantling Plan for SRE, FDP-704-990-003 by B. F. Ureda and W. F. Heine, June 24, 1975.

VII

Appended Forms

- Figure 1 - Form 732-A Health and Safety Analysis Report
- Figure 2 - Form 719-L Restricted Access Area Entry Permit
- Figure 3 - Form No Number Health Physics Data Request
- Figure 4 - Form No Number Radiation/Smear Survey Completion Data
- Figure 5 - Cumulative Air Sample Data
- Figure 6 - Monthly Dosimeter Record
- Figure 7 - Respirator Issuance Record

ANALYZED _____
 DATE ANALYZED _____
 FILM NO. _____
(DO NOT WRITE IN THIS BOX)



Atomics International Division
 Rockwell International

HEALTH AND SAFETY ANALYSIS REPORT

SUBMITTED BY _____
 DATE SAMPLED _____
 BLDG. AND ROOM NO. _____

SAMPLE NUMBER	DESCRIPTION AND LOCATION	RESULTS			

COMMENTS: _____

LEDGER ACCOUNT _____ CONTRACT OR ORDER _____ SIGN ACCOUNT _____ WORK RELEASE _____

LOG BOOK NO. _____ PAGE _____

TYPE OF SAMPL
 SMEAR _____ (_____
 TYPE OF ANALY
 RADIOMETRIC _____
 OTHER _____

N704TP990008
 Page 9

RESTRICTED ACCESS AREA ENTRY PERMIT

No 17700

GROUP AUTHOR OR PERFORMING WORK

REQUESTED BY: _____ DEPT: _____
 JOB LOCATION _____
 JOB DESCRIPTION _____

BEFORE STARTING WORK, OPERATIONAL SAFETY SUPERVISION OF GROUP AUTHORIZING OR PERFORMING WORK, AND SUPERVISION OF WORK AREA **MUST BE NOTIFIED.**

REFERENCE PROCEDURE, WORK REQUEST, JOB ORDER, ETC. _____
 DATE OF REQUEST _____ WORK TO _____

N704TP990008

Page 10

OPERATIONAL SAFETY AND ORIGINATOR

NAME AND IDENTIFICATION OF PERSONS COVER

NAME	NR SERIAL	NON-NR AFFILIATION

PROTECTIVE EQUIPMENT REQUIRED

- | | | | |
|--|---|---|---|
| <p>HANDS</p> <ul style="list-style-type: none"> <input type="checkbox"/> CANVAS GLOVES <input type="checkbox"/> NEOPRENE GLOVES <input type="checkbox"/> PVC GLOVES <input type="checkbox"/> SURGEON'S GLOVES <input type="checkbox"/> LEATHER GLOVES <input type="checkbox"/> GAUNTLET TYPE <input type="checkbox"/> _____ <p>BODY</p> <ul style="list-style-type: none"> <input type="checkbox"/> COVERALLS <input type="checkbox"/> LAB COAT <input type="checkbox"/> SURGEON'S CAP | <ul style="list-style-type: none"> <input type="checkbox"/> HOOD <input type="checkbox"/> ACID APRON <input type="checkbox"/> GONAD SHIELD <input type="checkbox"/> HARD HAT <input type="checkbox"/> PHENOLIC <input type="checkbox"/> FACE SHIELD <input type="checkbox"/> EYE PROTECTION <input type="checkbox"/> SAFETY GLASSES <input type="checkbox"/> JONES GOGGLES <input type="checkbox"/> EAR PROTECTION <input type="checkbox"/> EAR PLUGS <input type="checkbox"/> EAR MUFFS <input type="checkbox"/> SAFETY HARNESS <input type="checkbox"/> SAFETY BELT | <p>FEET</p> <ul style="list-style-type: none"> <input type="checkbox"/> TOE GUARDS <input type="checkbox"/> CANVAS COVERS <input type="checkbox"/> PLASTIC COVERS <input type="checkbox"/> BOOTS <input type="checkbox"/> LEGGINGS <p>RESPIRATORY PROTECTION</p> <ul style="list-style-type: none"> <input type="checkbox"/> SCBA <input type="checkbox"/> AIR SUPPLIED RESPIRATOR | <ul style="list-style-type: none"> <input type="checkbox"/> FILTER TYPE RESPIRATOR <input type="checkbox"/> FULL FACE <input type="checkbox"/> COMFO <input type="checkbox"/> ULTRA FILTER <input type="checkbox"/> DUST FILTER <input type="checkbox"/> ORGANIC VAPOR <input type="checkbox"/> ACID GASES <input type="checkbox"/> _____ |
|--|---|---|---|

PERSONNEL MONITORING EQUIPMENT

- BETA-GAMMA FILM BADGE
- NEUTRON FILM BADGE
- BETA-GAMMA DOSIMETER
- NEUTRON DOSIMETER
- EXTREMITY MONITORING
- LAPEL AIR SAMPLER

SPECIAL REQUIREMENTS

- PERSONAL SURVEY
- TOOL SURVEY
- WELDING PERMIT
- CONFINED SPACE PROCEDURES
- OXY DEFICIENCY TEST _____% O₂
- COMBUSTIBLE ATMOSPHERE _____% LEL
- TOXIC ATMOSPHERE TEST _____% TLV
- STANDBY REQUIRED
- FIRE PROTECTION

RADIATION MEASUREMENTS

BETA _____ mrem/hr
 GAMMA _____ mrem/hr
 NEUTRON _____ mrem/hr
 TOTAL _____ mrem/hr

SURFACE CONTAMINATION LEVEL _____

AIRBORNE CONTAMINATION LEVEL _____

SPECIAL INSTRUCTIONS _____

APPROVALS FOR PERFORMING WORK

SUPERVISOR OF AREA WHERE WORK WILL BE PERFORMED _____ DATE _____
 SUPERVISOR OF GROUP AUTHORIZING OR PERFORMING WORK _____ DATE _____
 OPERATIONAL SAFETY _____ DATE _____ PERMIT EXPIRES _____

ALL PERSONS COVERED BY THIS PERMIT MUST INITIAL AFTER SAFETY INSTRUCTIONS HAVE BEEN GIVEN

HEALTH PHYSICS DATA REQUEST

FACILITY

DATE	REQUESTOR	REQUIREMENT	RESULT	DATE

Radiation/Smear Survey Completion Data

Item/Area	Date	Results of Survey	Disposition		Remarks
			R/A Waste	Decontaminate	

Figure 4

MONTH OF _____



Atomic International Division
Rockwell International

BLDG _____

MONTHLY DOSIMETER RECORD

NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL			

N704TP990008
Page 14

