

GEORGIA POWER COMPANY

HATCH NUCLEAR PLANT

PROCEDURE

Decontamination  
PROCEDURE TITLE

HNP-8006  
PROCEDURE NUMBER

Lab  
RESPONSIBLE SECTION

SAFETY RELATED ( X )

NON-SAFETY RELATED ( )

REV.	DESCRIPTION	APPROVED DEPT. HEAD	APPROVED PLANT MANAGER	DATE
5	Page 4	<i>W.H. Proger</i>	<i>Sam Hume</i>	7/26/82
6	Pages 1 and 4	<i>W.H. Proger</i>	<i>Henry King</i>	11/20/85

HNP-8

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F PDR

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*219*  
PROCEDURE REVISION REQUEST

PROCEDURE NO. HNP- 8006

Revision No. 5

REQUESTED BY		DEPARTMENT HEAD APPROVAL	
Name:	Date:	Signature:	Date:
<i>Michael T. James</i>	<i>8-17-82</i>	<i>W. W. Payer</i>	<i>9-12-82</i>

REVISION CHANGES MODE OF OPERATION OR INTENT AS DESCRIBED IN FSAR:  
( ) Yes (X) No

CHANGE INVOLVES:  
( ) An unreviewed Safety Question ( ) Tech. Specs. (X) Neither  
(See back for Safety Evaluation if required).

Safety Related (X) Non-Safety Related ( )

Safety/Non-safety Status Change ( ) Yes (X) No

Attach marked up copy of procedure to this form.

REASON FOR REQUEST *Pg. 1, Para B+C reverse B+C to*  
*comply with HNP-9*

PRB RECOMMENDS APPROVAL: (X) Yes ( ) No

*Steve Joss*  
PRB Secretary

*82-115*  
PRB No. of

*9/21/82*  
Date

## SAFETY EVALUATION

The revision of this procedure does not constitute an unreviewed safety question as explained below.

1. The probability of occurrence and the consequences of an accident or malfunction of equipment important to safety are not increased above those analyzed in the FSAR due to these changes because the revision does not change the purpose or performance of the system.

2. The possibility of an accident or malfunction of a different type than analyzed in the FSAR does not result from this change because the system responds and is operated as before the change.

3. The margin of safety as defined in the Technical Specifications is not reduced due to this revision because the revision does not change any limited safety system settings which would allow a safety limit to be exceeded or to allow a limiting condition for operations to be exceeded as stated in Technical Specifications.

REVISION
See Title Page
DATE
See Title Page

PROCEDURE NO
HNP- 8006
REVISION NO
6
PAGE NO
1 of 10

## DECONTAMINATION

### A. PURPOSE

To establish a basic technique for decontamination of equipment, floors, and personnel that may become contaminated during operation of a nuclear facility.

### B. REFERENCE

Observe Radiation Protection Procedures.

### C. SAFETY

Radiological Health Handbook.

### D. GENERAL

During operation of a nuclear facility, equipment, floors, and personnel become contaminated. Decontamination should be done prior to maintenance work or release from a Radiation Control Area. Decontamination may be done at the work location or it may be brought into a decontamination room or area as necessary.

### E. EQUIPMENT DECONTAMINATION

#### 1. Equipment decontamination at work location:


- a. Place plastic sheeting under the equipment to be decontaminated. This sheeting should be extended enough in each direction to assure that floors are not contaminated.
- b. Soak some absorbent cloth with water and squeeze out excess water. (It may also be desirable to wet absorbent cloth with a detergent such as Alconox.)
- c. Using an individual cloth rub an area approximately 6" X 6" and then place the used cloth in a plastic bag.

#### NOTE

Soaking wet rags should not be placed into a radwaste container. Contact a Health Physics Foreman for proper disposal methods of wet articles.

Always work from the least contaminated areas toward the most contaminated areas to minimize spreading.

See Title Page
DATE See Title Page

Georgia Power 

PROCEDURE NO. HNP- 800C
REVISION NO. 6
PAGE NO. 2 of 10

- d. Using a dry cloth, wipe up the detergent - water residue, and place the cloth in a radwaste container.
  - e. Repeat E.1.c and E.1.d in a new area. (Intermittent surveys with an appropriate radiation detecting instrument will show which area the decontamination must be repeated.)
2. Equipment decontamination in decontamination areas:

Equipment which is difficult to decontaminate at work location is wrapped or sealed in plastic and carried to the decontamination room or area for clean-up. See Radiological Health Handbook or Figures 2 through 2d for other decon methods.

#### F. FLOOR AND AREA DECONTAMINATION

##### NOTE

See HNP-8005 section E.2.b for floor decontamination limits.


The techniques used for the decontamination of floors or areas vary with the level and extent of contamination. For high-level or spotty contamination, the technique described in E.1 above is used to avoid spread of the contamination. For low-level contamination of large areas, a scrubbing machine or mop are used with water and detergent. Masslin cloth used with a sweeping pad may also be used for decontaminating large areas. The types of material used for decontamination will vary with the activity and area, therefore Health Physics personnel will determine the materials to be used prior to decontamination.

##### NOTE

When using vacuum cleaner for contamination removal, exercise extreme care when removing the filter from the cleaner for disposal. Follow procedure as in Figure 1 to minimize airborne activity.

**REFERENCE ONLY**

DATE	See Title Page
DATE	See Title Page

Georgia Power 

PROCEDURE NO	HNP- 8006
REVISION NO	6
PAGE NO	3 of 10

G. PERSONNEL DECONTAMINATIONNOTE

See HNP-8005 section E.2.e for personnel contamination limits.

1. Decontamination shower(s) are supplied for decontamination of personnel. Superficial hand contamination can be washed off by the person involved after notifying H.P. After washing, the hands and arms must be monitored carefully to assure that the contamination is removed. If the contamination involves parts of the body other than the hands or if the hand contamination cannot be removed by simply soap and water washing, Health Physics personnel must be notified.
2. The following procedure is used for the cleanup of skin contamination.
  - a. If the contamination is spotty, the spots are cleaned up using cotton swabs dipped in a thick mixture of detergent. This mixture is removed using clean cotton swabs.
  - b. If the contamination is general, the skin area must be washed with soap and water. (If the contamination is widespread the decontamination shower may be used.)
  - c. After washing, the skin area is surveyed with an E-100 or RM-14 count-rate meter. If detectable contamination is found, the area must be rewashed.
  - d. After two washings, if the contamination is still present, the skin area should be scrubbed with a brush using a thick solution of detergent, such as Tide). Use light pressure with heavy lather. (Do not scratch or erode the skin.)


NOTE

Only if steps G.1 through G.2.d are unsuccessful are steps G.2.e and G.2.f to be attempted.

- e. After repeated scrubbing, if the contamination is still present, a thick paste of titanium dioxide and water is applied to the area and kept moist. After the paste has stayed on the skin for approximately two minutes, it is removed and the skin area washed with soap and water.

REFERENCE ONLY

See Title Page
DATE
See Title Page

Georgia Power 

PROCEDURE NO	HNP- 8006
REVISION NO	6
PAGE NO	4 of 10

- f. If the titanium dioxide paste does not remove the contamination, the skin area is painted with a 4 percent solution of potassium permanganate. The area is painted three times, allowing each application to dry. The skin discoloration is removed with a 4 percent solution of sodium bisulfite.
- g. Decontamination around eyes, in nasal passages or other body orifices, is done under the supervision of the Health Physics staff.

#### NOTE

Serious cuts or wounds should not be decontaminated unless done so by a Doctor.

Whenever it is suspected that personnel could have ingested radioactive contamination, a scan for internal contamination should be performed using a whole body counter as soon as possible.

- h. Anytime personnel decontamination is performed, the Health Physics staff must be notified. The Health Physics Supervisor or his designated alternate will determine the necessity for documenting the decontamination of Form 1 of HNP-8009.
3. During an emergency situation, personnel decontamination may be required at a location which is not equipped to handle liquid radwaste. In these instances a decontamination kit must be used, and the decontamination effort done without the use of water. Prior to initiating any decontamination activity, plastic or similar material should be placed on the ground for the effected person to stand on. Radcon should then be sprayed onto a towel which is used to clean the contaminated area(s). Contaminated towels should be stored in a yellow bag when decontamination is complete. If this method is unsuccessful, or if the contamination is widespread, the individual should don a disposable coverall and relocate to the nearest facility which is equipped to handle liquid radwaste. These facilities are marked accordingly, e.g. "Emergency Decontamination Shower". Aside from the existing facilities in the plant, these showers will be located in the welding training building and the Environmental building. The procedures described in Section C.1 and C.2 should be followed at these facilities.

See Title Page

CASE

See Title Page


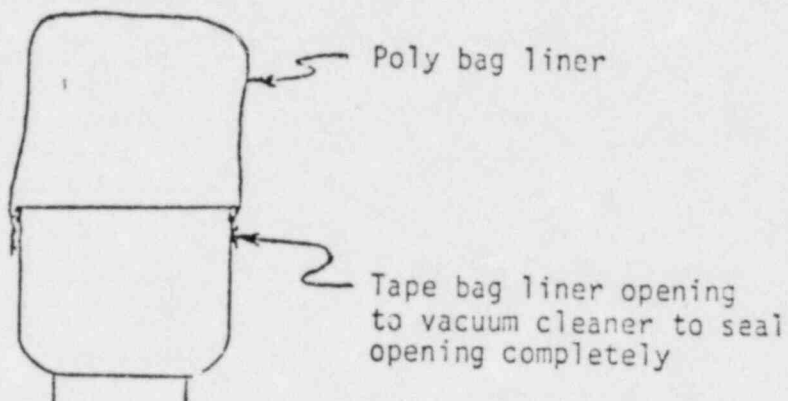
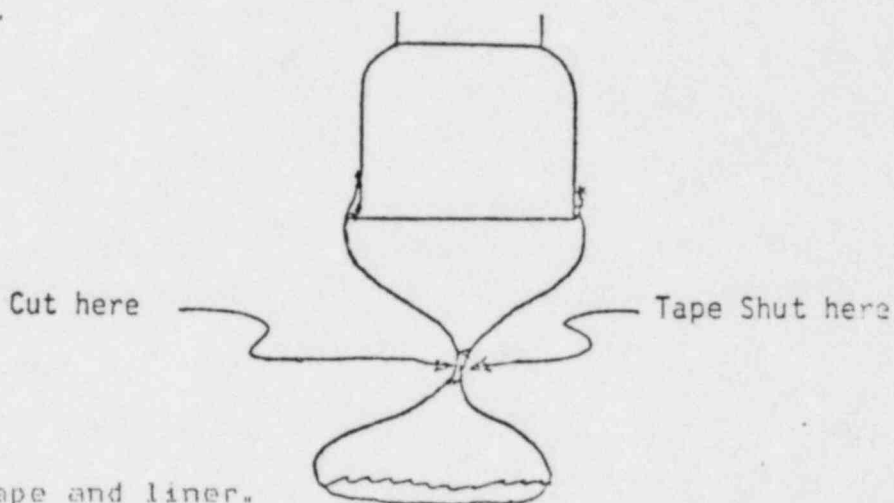
Georgia Power 

FIGURE 1  
VACUUM CLEANER FILTER REMOVAL TECHNIQUE

1. Place poly bag liner over top of cleaner as in sketch below. Tape to cleaner.



2. Invert cleaner and liner to remove filter.
3. With most of debris in bottom of liner, tape liner shut as in figure below.



4. Carefully cut tape and liner.
5. Carefully remove remaining half of liner from cleaner and tape open end of poly bag liner shut.
6. Place all material in proper container for radioactive waste.



See Title Page

DATE

See Title Page


Georgia Power 

FIGURE 2  
PERSONNEL DECONTAMINATION

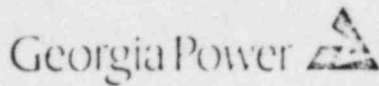
Method*	Surface	Action	Technique	Advantages	Disadvantages
Soap and water	Skin and hands	Emulsifies and dissolves contaminate.	Wash 2-3 minutes and monitor. Do not wash more than 3-4 times	Readily available and effective for most radioactive contamination.	Continued washing will defat the skin. Indiscriminate washing of other than affected parts may spread contamination.
Soap and water	Hair	Same as above	Wash several times. If contamination is not lowered to acceptable levels, shave the head and apply skin decontamination methods.		
Lava soap, soft brush, and water	Skin and hands	Emulsifies, dissolves, and erodes.	Use light pressure with heavy lather. Wash for 2 minutes, 3 times. Rinse and monitor. Use care not to scratch or erode the skin. Apply lanolin or hand cream to prevent chapping	Same as above	Continued washing will abrade the skin.
Tide or other detergent (plain)	Same as above	Same as above	Make into a paste. Use with additional water with a mild scrubbing action. Use care not to erode the skin.	Slightly more effective than washing with soap.	Will defat and abrade skin and must be used with care

\* Begin with the first listed method and then proceed step by step to the more severe methods, as necessary.

REFERENCE ONLY

manual set

NOVA  
 See Title Page  
 DATE  
 See Title Page



PROCEDURE NO  
 HNP- 8006  
 REVISION NO  
 6  
 PAGE NO  
 7 of 10

FIGURE 2a  
 PERSONNEL DECONTAMINATION - CONTINUED

Method*	Surface	Action	Technique	Advantages	Disadvantages
Mixture of 50% Tide and 50% cornmeal	Skin and hands	Emulsifies, dissolves, and erodes.	Make into a paste. Use with additional water with a mild scrubbing action. Use care not to erode the skin.	Slightly more effective than washing with soap.	Will defat and abrade skin and must be used with care.
5% water solution of a mixture of 30% Tide, 65% Calgon, 5% Carbose (carboxymethyl cellulose)	Same as above.	Same as above.	Use with water. Rub for a minute and rinse.	Same as above.	Same as above.
A preparation of 8% Carbose, 3% Tide, 1% Versene, and 88% water homogenized into a cream.	Same as above.	Same as above.	Use with additional water. Rub for 1 minute and wipe off. Follow with lanolin or hand cream.	Same as above.	Same as above.
Titanium dioxide paste. Prepare by mixing precipitated titanium dioxide (a very thick slurry, never permitted to dry) with a small amount of lanolin. If not successful, go on to next step.	Skin, hands, and extremities. Do not use near face or other body openings.	Same as above.	Work the paste into the affected area for 2 minutes. Rinse and wash with soap and warm water. Monitor.	Removes contamination lodged under scaly surface of skin. Good for heavy surface contamination of skin.	If left on too long will remove skin.

\* Begin with the first listed method and then proceed step by step to the more severe methods, as necessary.

See Title Page

DATE

See Title Page


Georgia Power 

FIGURE 2b  
PERSONNEL DECONTAMINATION - CONTINUED

Method*	Surface	Action	Technique	Advantages	Disadvantages
Mix equal volumes of a saturated solution of potassium permanganate and 0.2 N sulfuric acid. (Saturated solution of $KMnO_4$ is 6.4 grams per 100 ml of $H_2O$ .) Continue with next step.	Skin, hands, and extremities. Do not use near face or other body openings.	Dissolves contaminant absorbed in the epidermis.	Pour over wet hands, rubbing the surface and using hand brush for not more than 2 minutes. Rinse with water.	Superior for skin contamination. May be used in conjunction with titanium oxide.	Will remove a layer of skin if in contact with the skin for more than 2 minutes.
Apply a freshly prepared 5% solution of sodium acid sulfite. (Solution made by dissolving 5 gm of $NaHSO_3$ crystals in 100 ml distilled water.)	Same as above.	Removes the permanganate stain.	Apply in same manner as above. Apply for not more than 2 minutes. The above procedure may be repeated. Apply lanolin or hand cream when completed.		Same as above.
Flushing	Eyes, ears, nose, and mouth	Physical removal by flushing.	Roll back the eyelid as far as possible, flush with large amounts of water. If isotonic irrigants are available, obtain them without delay. Apply to eye continually and then flush with large amounts of water.	If used immediately will remove contamination. May also be used for ears, nose, and throat.	When using for nose and mouth, contamination individual should be warned not to swallow the rinses.

\* Begin with the first listed method and then proceed step by step to the more severe methods, as necessary

Reference Only

See Title Page
DATE
See Title Page

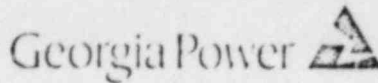


FIGURE 2c  
PERSONNEL DECONTAMINATION - CONTINUED

Method*	Surface	Action	Technique	Advantages	Disadvantages
Flushing (cont'd)			(Isotonic irrigant (0.9% NaCl solution): 9 grams NaCl in beaker, fill ot 1000 cc with water.) Can be purchased from drug suppliers, etc.		
Flushing	Wounds	Physical removal by flushing.	Further decontamination should be done under medical supervision. Wash wound with large amounts of water and spread edges to stimulate bleeding, if not profuse. If profuse, stop bleeding first, clean edges of wound, bandage, and if any contamination remains, it may be removed by normal cleaning methods, as above.	Quick and efficient if wound not severe.	May spread contamination to other areas of body if not done carefully.
Sweating	Skin of hands and feet	Physical removal by sweating.	Place hand or foot in plastic glove or booty. Tape shut. Place near source of heat for 10-15 minutes or	Cleansing action is from inside out. Hand does not dry out	If glove or booty is not removed shortly after profuse sweating starts a d part washed with soap

\* Begin with the first listed method and then proceed step by step to the more severe methods, as necessary.

See Title Page
DATE
See Title Page

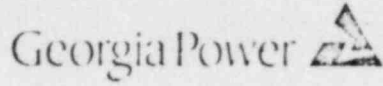


FIGURE 2d  
PERSONNEL DECONTAMINATION - CONTINUED

Method*	Surface	Action	Technique	Advantages	Disadvantages
Sweating (Cont'd)			until hand or foot is sweating profusely. Remove glove and then wash using standard techniques. Or gloves can be worn for several hours using only body heat.		and water immediately, contamination may seep into the pores.

AREA AND MATERIAL DECONTAMINATION

Method*	Surface	Action	Technique	Advantages	Disadvantages
Vacuum cleaning	Dry surfaces	Removes contaminated dust by suction.	Use conventional vacuum technique with efficient filter.	Good on dry, porous surfaces. Avoids water reactions.	All dust must be filtered out of exhaust. Machine is contaminated.
Water	All nonporous surface (metal, painted, plastic, etc.)	Dissolves and erodes.	For large surface Hose with high-pressure water at an optimum distance of 15 to 20 feet. Spray vertical surfaces at an angle of incidence of 30° to 40°; work from top to bottom to avoid recontamination. Work upwind to avoid spray.	All water equipment may be utilized. Allows operation to be carried out from a distance. Contamination may be reduced by 50%. Water equipment may be used for solutions of other decontaminating agents.	Drainage must be controlled. Not suitable for porous materials. Oiled surfaces cannot be decontaminated. Not applicable on dry contaminated surfaces (use vacuum); not applicable on porous surfaces such as wood, concrete.

\* Begin with the first listed method and then proceed step by step to the more severe methods, as necessary.

REFERENCE ONLY