

Jul. 02, 2002

Page 1 of 1

50-387/388

MANUAL HARD COPY DISTRIBUTION

DOCUMENT TRANSMITTAL 2002-31854

USER INFORMATION:

~~FLAIM*LAUREL B~~ EMPL#:23244 CA#: 0386

~~Address: NUCSA2~~

Phone#: 254-3658

TRANSMITTAL INFORMATION:

TO: ~~FLAIM*LAUREL B~~ 07/02/2002

LOCATION: DOCUMENT CONTROL DESK

FROM: NUCLEAR RECORDS DOCUMENT CONTROL CENTER
(NUCSA-2)

THE FOLLOWING CHANGES HAVE OCCURRED TO THE HARDCOPY
OR ELECTRONIC MANUAL ASSIGNED TO YOU:

106 - 106 - HEALTH PHYSICS SPECIALIST (DUTY
FOREMAN): EMERGENCY PLAN-POSITION SPECIFIC
PROCEDURE

REMOVE MANUAL TABLE OF CONTENTS DATE: 05/24/2002

ADD MANUAL TABLE OF CONTENTS DATE: 07/01/2002

CATEGORY: PROCEDURES TYPE: EP

ID: EP-PS-106

ADD: PCAF 2002-1440 REV: N/A

UPDATES FOR HARD COPY MANUALS WILL BE DISTRIBUTED
WITHIN 5 DAYS IN ACCORDANCE WITH DEPARTMENT
PROCEDURES. PLEASE MAKE ALL CHANGES AND
ACKNOWLEDGE COMPLETE IN YOUR NIMS INBOX UPON
RECEIPT OF HARD COPY. FOR ELECTRONIC MANUAL USERS,
ELECTRONICALLY REVIEW THE APPROPRIATE DOCUMENTS AND
ACKNOWLEDGE COMPLETE IN YOUR NIMS INBOX.

A045

1. PCAF NO. <u>2002-1440</u>	2. PAGE 1 OF <u>6</u>	3. PROC. NO. <u>EP-PS-106</u> REV. <u>9</u>
4. FORMS REVISED - <u>C</u> R <u>6</u> , - <u> </u> R <u> </u> , - <u> </u> R <u> </u> , - <u> </u> R <u> </u> , - <u> </u> R <u> </u> , - <u> </u> R <u> </u>		
5. PROCEDURE TITLE Health Physics Specialist: Emergency Plan Specific Instruction		
6. REQUESTED CHANGE PERIODIC REVIEW <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES INCORPORATE PCAFS <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES # <u> </u> # <u> </u> # <u> </u> # <u> </u> REVISION <input type="checkbox"/> PCAF <input checked="" type="checkbox"/> DELETION <input type="checkbox"/> (CHECK ONE ONLY)		
7. SUMMARY OF / REASON FOR CHANGE This PCAF replaces the term "assembly" with "accountability" to be consistent with changes made in Revision 39 of the Emergency Plan. Sections impacted are major tasks list; supporting information list; and TAB C <div style="text-align: right;">Continued <input type="checkbox"/></div>		
8. DETERMINE COMMITTEE REVIEW REQUIREMENTS (Refer to Section 6.1.4) PORC REVIEW REQ'D? <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		9. PORC MTG# <u>na</u>
BLOCKS 11 THRU 16 ARE ON PAGE 2 OF FORM		
17. <u>Cynthia Smith</u> / <u>254-3233</u> / <u>06/14/2002</u> PREPARER ETN DATE (Print or Type)		18. COMMUNICATION OF CHANGE REQUIRED? <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES (TYPE) <u> </u>
19. <u>Ronald E. Smith</u> <u>6/14/2002</u> RESPONSIBLE SUPERVISOR DATE		SIGNATURE ATTESTS THAT RESPONSIBLE SUPERVISOR HAS CONDUCTED QADR AND TECHNICAL REVIEW UNLESS OTHERWISE DOCUMENTED IN BLOCK 16 OR ATTACHED REVIEW FORMS. CROSS DISCIPLINE REVIEW (IF REQUIRED) HAS BEEN COMPLETED BY SIGNATURE IN BLOCK 16 OR ATTACHED REVIEW FORMS.
20. <u>Jeffrey J. Jurek</u> <u>6/14/02</u> FUM APPROVAL DATE		
21. RESPONSIBLE APPROVER <u>NA</u> INITIALS		ENTER N/A IF FUM HAS APPROVAL AUTHORITY DATE

PROCEDURE CHANGE PROCESS FORM

1. PCAF NO. <u>2002-1440</u>	2. PAGE 2 OF <u>6</u>	3. PROC. NO. <u>EP-PS-106</u> REV. <u>9</u>
------------------------------	-----------------------	---

11. This question documents the outcome of the 50.59 and 72.48 Review required by NDAP-QA-0726. Either 11a, b, c or d must be checked "YES" and the appropriate form attached or referenced.

a. This change is an Administrative Correction for which 50.59 and 72.48 are not applicable.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> N/A
b. This change is a change to any surveillance, maintenance or administrative procedure for which 50.59 and 72.48 are not applicable. <u>A-01-732</u>	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> N/A
c. This change is bounded by a 50.59/72.48 Screen/Evaluation, therefore, no new 50.59/72.48 Evaluation is required. Screen/Evaluation No. _____	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> N/A
d. 50.59 and/or 72.48 are applicable to this change and a 50.59/72.48 Screen/Evaluation is attached.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> N/A

12. This change is consistent with the FSAR or an FSAR change is required. ☒ YES
Change Request No. na

13. Should this change be reviewed for potential effects on Training Needs or Material? ☐ YES ☒ NO
If YES, enter an Action Item @ NIMS/Action/Gen Work Mech/PICN

14. Is a Surveillance Procedure Review Checklist required per NDAP-QA-0722? ☐ YES ☒ NO

15. Is a Special, Infrequent or Complex Test/Evolution Analysis Form required per NDAP-QA-0320? (SICT/E form does not need to be attached.) ☐ YES ☒ NO

16. Reviews may be documented below or by attaching Document Review Forms NDAP-QA-0101-1.

REVIEW	REVIEWED BY WITH NO COMMENTS	DATE
QADR		
TECHNICAL REVIEW		
REACTOR ENGINEERING/NUCLEAR FUELS *		
IST **		
OPERATIONS		
NUCLEAR SYSTEMS ENGINEERING		
NUCLEAR MODIFICATIONS		
MAINTENANCE		
HEALTH PHYSICS		
NUCLEAR TECHNOLOGY		
CHEMISTRY		
OTHER <u>10CFR50.54Q</u>	<u>C. A. Smith</u>	<u>6/14/2002</u>

* Required for changes that affect, or have potential for affecting core reactivity, nuclear fuel, core power level indication or impact the thermal power heat balance. ⁽⁵⁸⁾

** Required for changes to Section XI Inservice Test Acceptance Criteria.

HEALTH PHYSICS SPECIALIST
(DUTY FOREMAN):

Emergency Plan-Position Specific Procedure

WHEN: Technical Support Center (TSC) is activated

HOW NOTIFIED: Paged, on- and off-hours

REPORT TO: Radiation Protection Coordinator (RPC) then
Damage Control Team Coordinator (DCTC)

WHERE TO REPORT: TSC

OVERALL DUTY:

Assess rad conditions within the restricted area and provide radiological and ALARA guidance to in-plant (India) teams.

MAJOR TASKS:	TAB:	REVISION:
Obtain briefing from the RPC and DCTC.	TAB A	4
Determine radiological conditions within the plant and restricted area.	TAB B	5
Assess onsite habitability - TSC, ^{accountability} assembly areas, evacuation routes, and gatehouses.	TAB C	5/6
Brief the RPC and DCTC when there are significant changes in radiological conditions onsite.	TAB D	2
Prepare for team dispatch.	TAB E	3
Provide guidance and brief teams on radiological and ALARA considerations.	TAB F	2
Monitor in-plant (India) team activities, exposures, and reported survey measurements.	TAB G	3
Coordinate the packaging and transportation of accident samples for onsite and/or offsite analysis.	TAB H	1
Debrief team on radiological conditions encountered.	TAB I	1
Coordinate vehicle decontamination.	TAB J	1

PCAF

SUPPORTING INFORMATION:

TAB:

Emergency Telephone Instructions	TAB 1
Emergency Organization	TAB 2
Logkeeping	TAB 3
SSES Contamination Plan	TAB 4
Emergency Facility Form Flow	TAB 5
Habitability of ^{Accountability Areas,} Assembly Areas and Evacuation Routes	TAB 6
PPL Emergency Personnel Dose Assessment and Protective Action Recommendation Guide	TAB 7
Personnel Assembly and Accountability	TAB 8
Preparation for India Team Dispatch	TAB 9
Emergency Forms	TAB 10
<ul style="list-style-type: none"> • Emergency Exposure Extension Request • Potassium Iodide (KI) Tracking Form • Emergency Plan Radiation Work Permit 	
Accident Sample Packaging and Transportation	TAB 11

REFERENCES:

SSES Emergency Plan	
IE Notice 88-15	Approved Potassium Iodide for use in Emergency Involving Radioactive Iodine
NUREG-0654,	Planning Standards and Evaluation Criteria
NUREG-0731,	Guidelines for Utility Management Structure and Technical Resources, September 1980
HP-TP-801,	General Shipment of Radioactive Material

MAJOR TASK:

Assess onsite habitability - TSC, assembly areas, ^{accountability areas} evacuation routes, and gatehouses.

SPECIFIC TASKS:

HOW:

1. Establish contamination controls and surveys of the TSC.

- 1a. Direct the performance of routine smears and air samples.
- 1b. Direct the placement of step off pads and friskers at doorways during releases or if plant status warrants.

NOTE:

Frisking pads should be set up at the stairwell door, north end of the TSC, with the frisker located appropriately. Access to the TSC from the elevator should be prevented by placing signs in the elevator.

Hang "FRISKING REQUIREMENTS" signs at each end of the TSC. Update the signs as radiological conditions warrant

2. Assess habitability of accountability areas and evacuation routes.

- 1c. Direct HP personnel located on elevation 676' of the control structure to ensure personnel reporting to the TSC from the tunnel access use the contamination monitors if release conditions warrant.
- 1d. Direct the decontamination of the TSC or arriving personnel as necessary.

HELP

Personnel Assembly and Accountability
See TAB 8

Habitability of Accountability Areas, Assembly Areas and Evacuation Routes see TAB 6

PCAF

PCAF

SPECIFIC TASKS:

HOW:

3. Assess habitability of gatehouse or other facilities on site.

- 3a. If the gatehouses or Security Control Center is in the plume pathway, instruct the Security Coordinator to place the ventilation systems in recirculation, isolating the intake.
- 3b. If dose rates warrant, contact the Security Coordinator to evacuate structure(s).

SSES CONTAMINATION RESPONSE PLAN

TABLE OF CONTENTS

	PAGE
1.0 OVERVIEW	2
2.0 DEFINITIONS	2
3.0 CONTAMINATION ASSESSMENT	3
4.0 DECONTAMINATION	5
4.1 Building, Structure, Removable Equipment	5
4.2 Water	5
5.0 RELEASE CRITERIA IN RESTRICTED AREA	6
5.1 Structures and Equipment	6
5.2 Personal Property	7

SSES CONTAMINATION RESPONSE PLAN

1.0 OVERVIEW

This plan describes actions to be taken in response to emergency conditions which result in deposition of radioactive contamination as a result of a release from the Susquehanna Steam Electric Station. Deposition may be within the restricted area, within the site boundary, offsite or a combination of these.

This plan considers only actions to be taken which are PPL's responsibility and does not describe emergency response agency actions outside the PPL site boundary or public protective action implementation.

This plan is applicable when an emergency condition has been declared at SSES, an accidental release of radioactive material has occurred and the release has been terminated.

Ground contamination occurs as a result of the deposition of radioactive particulate material released into the atmosphere. It may be in the form of particulates at the time of release or it may result from the decay of gaseous radionuclides. Since these materials, and the resultant dose rates, may persist for an extended period of time following termination of a release, qualitative and quantitative analysis is necessary to assess long-term exposures. In addition, variability of levels within the affected area is expected to be high, due to meteorological and terrain conditions, and ultimately may require days or weeks of sampling to ensure adequate characterization.

2.0 DEFINITIONS

- 2.1 **LEGAL SITE BOUNDARY** - "That line beyond which the land is not leased, owned, or otherwise controlled by the licensee."
- 2.2 **RESTRICTED AREA** - The area encompassed by the inner security fence.
- 2.3 **EMERGENCY PLAN BOUNDARY** - Same as the Exclusion Area, i.e. that area around Susquehanna SES within a radius of 1800 feet determined in accordance with 10CFR100.16.

The EPB is used to calculate offsite dose rates, project dose to the public, and to determine necessary Protective Action Recommendations for the public.

- 2.4 **EMERGENCY PLANNING ZONE** - An area approximately ten miles in radius around SSES for which emergency planning consideration of the plume exposure pathway has been given in order to ensure prompt and

effective actions can be taken to protect the public in the event of an accident at SSES.

- 2.5 **INGESTION PATHWAY ZONE** - An area approximately fifty miles in radius around SSES for which emergency planning consideration for the ingestion exposure pathway has been given.

3.0 CONTAMINATION ASSESSMENT

- 3.1 Upon termination of a release, the following actions should be done:

- 3.1.1 Perform smear samples and direct frisk of ground, building and temporary structure surfaces inside the restricted area which are believed to be in the plume pathway in order to determine the extent of the affected area.

Results which exceed 1000 dpm/100 cm² removable (smear survey) contamination or exceed 100 cpm above background on a frisker shall be designated contaminated.

Affected areas and/or equipment shall be roped/taped off as appropriate and posted as contaminated.

- 3.1.2 Perform isotopic analysis of a representative sample of onsite smears if not previously performed. Use of portable gamma spectroscopy equipment may be considered to assist in characterization of the depositions.

- 3.1.3 Perform smear samples and direct frisk survey of ground surfaces and all vehicles, equipment, and facilities outside the restricted area and within the site boundary believed to be in the plume pathway to determine the extent of affected areas.

NOTE: Results which exceed 1000 dpm/100 cm² removable contamination or exceed 100 cpm above background on a frisker shall be designated contaminated.

Use of the portable gamma spectroscopy system may be considered to assist in the characterization of the deposition.

- 3.1.4 Initiate surveys of building ventilation intakes to determine if airborne radioactive material was drawn into air supply systems. Surveys of noncontrolled zone areas such as the S&A Building, South Building, trailers, etc. should be performed prior to allowing personnel to re-enter these areas. Air conditioners running at the time of the release should also be surveyed.

- a. Initiate surveys of building areas in unrestricted areas (such as APF, SLC, etc.) believed to be in the plume pathway prior to allowing personnel to re-enter these areas.
- b. Perform surveys of the service air and instrument air intakes and components to determine if these systems are contaminated. Air samples from the service air system should also be considered. Use of supplied air respiratory protection should be prevented until the evaluation is complete.

3.1.5 Direct Chemistry personnel to:

- a. Sample standing water in the storm drainage system, roofs, equipment, pools, etc.
- b. Sample the site drinking water supply. Prevent the use of drinking water until water evaluation is complete.
- c. Initiate sampling of the Sewage Treatment Facility. If influent conditions permit, discharge should be prevented until analysis is complete. Liquid release dose calculations may be required if the discharge cannot be diverted.

3.1.6 Perform contamination surveys of areas outside the site boundary as directed by the Emergency Director or Recovery Manager. The State has primary responsibility for survey of these areas; however, it is expected that PPL assistance will be requested to assist in delineation of affected areas. Survey locations outside the site boundary should be as accurately described as possible by the monitoring teams. Isotopic analysis of a representative sample of smears should be performed as soon as practical.

3.1.7 Perform environmental sampling in accordance with EP-PS-248, Field Team Director.

3.1.8 Consider covering contaminated surfaces (building roofs, grounds and/or equipment) with reinforced plastic covering to minimize the spread of contamination until decontamination can take place.

3.1.9 Plug applicable building roof drains to prevent runoff of contaminated water.

3.1.10 Consider use of bladders to isolate storm drains and/or drainage channels in the event of precipitation. The Spill Response Team and PPC plan maybe used to assist in these actions.

3.1.11 Request that engineering personnel identify any other normally clean plant systems which may have become contaminated during the release and survey, as necessary.

3.1.12 Coordinate with the Field Team Director to have Ecology-III personnel perform soil sampling of affected areas within the site boundary in accordance with the EREMP procedure for soil sampling.

4.0 DECONTAMINATION

4.1 Building(s), Structure(s), Removable Equipment Decontamination

4.1.1 Should be performed as soon as practical following termination of the release.

NOTE: Methods used for decontamination should generate limited quantities of waste water. Run off into the plant drainage system should be avoided if possible. Water generated should be collected, sampled, analyzed and treated as necessary.

4.1.2 Decontamination methods include, but are not limited to:

- a. Wipe down with approved decontamination chemicals
- b. Strippable paint
- c. Washing (water must be collected, sampled and treated, if contaminated, prior to disposal)
- d. Transport of movable equipment into radiologically controlled areas for decon
- e. Fix contamination using paint, plastic sealants, concrete, etc.
- f. Control areas until activity decays to acceptable levels, if release into environment is unlikely

4.2 Water Decontamination

4.2.1 Treatment of contaminated water from the following sources may be required:

- a. Roof drains previously plugged or routed to temporary tanks

- b. Water collected in the storm drainage system
- c. Decontamination of buildings, equipment and vehicles
- d. Collected water on site such as in the CST berm or Spray Pond
- e. Hydrolasing and/or flushing of roof drains, drainage systems, etc.

4.2.2 Contractor assistance and a portable demineralizer may be required.

5.0 RELEASE CRITERIA IN RESTRICTED AREA

5.1 Structures and Equipment

5.1.1 Release criteria for structures and equipment inside the Restricted Area are:

- a. Surfaces should be decontaminated to levels below the following:
 - (1) Removable contamination: $<1000 \text{ dpm}/100 \text{ cm}^2$
 - (2) Fixed contamination: $<100 \text{ cpm}$ above background on a frisker or equivalent instrumentation
- b. If decontamination below these levels is not possible, alternatives include:
 - (1) Disposal of the material as waste
 - (2) Fix contamination using paint, plastic sealants, etc. - resulting dose rate shall be less than 10 mrem per year (see NOTE on next page).
- c. Ground contamination of soils, rocks, paved surfaces, etc. inside the restricted area should be removed if the area is small. For larger areas, levels which would not result in dose to an individual in excess of 10 mrem/year are acceptable.

NOTE: This guidance is in accordance with NUREG/CR-289, PNL-5429, "Residual Radionuclide Contamination Within and Around Commercial Nuclear Power Plants," February 1986.

This level is considered sufficiently low so as not to endanger the health and safety of either SSES site

workers or members of the general public. Records of these areas and final levels of radioactivity must be maintained for the life of the Plant and should be included in the decommissioning plan.

5.2 Personal Property

5.2.1 Contamination levels on personal property being removed from the restricted area, including vehicles, must be reduced to less than the following:

- a. Removable - $<1000 \text{ dpm}/100 \text{ cm}^2$
- b. Fixed - $<100 \text{ cpm}$ above background on a frisker (or equivalent instrumentation)

**HABITABILITY OF ACCOUNTABILITY AREAS, ASSEMBLY AREAS, AND
EVACUATION ROUTES**

1. Upon notification of Accountability the Health Physics Specialist will:
 - a. Confirm initial habitability of all accountability areas based upon plant radiological conditions, as indicated by local CAMs and ARMs.
 - b. Consider the necessity of an alternate (the Control Structure Access Corridor) or remote holding area if readings from radiological instrumentation $\geq 5.0\text{mR/hr}$ and are confirmed by an independent rad survey.
 - (1) If a remote holding area is required, select an area which is upwind of any actual or potential radiological release.
 - (a) Susquehanna Energy Information Center - NE Sector.
 - (b) West Building - WSW Sector.
 - (2) Inform the Radiological Protection Coordinator.
 - c. Establish a habitability monitoring program for those assembly areas that will be used as essential personnel work areas or holding areas to support OSC and TSC operations.
2. For site evacuation of non-essential personnel, the Health Physics Specialist shall:
 - a. Ensure that evacuation routes are not in the plume pathway.
 - b. Recommend alternate evacuation routes to the RPC.

PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 EMERGENCY DOSE LIMITS	2
2.0 EMERGENCY EXPOSURE/ACCIDENTAL OVEREXPOSURE	3
3.0 PROTECTIVE ACTIONS	3
4.0 EMERGENCY EXPOSURE NOTIFICATION AND HEALTH CONSEQUENCE INVESTIGATION	4
EMERGENCY EXPOSURE EXTENSIONS	5
HEALTH PHYSICS AND ALARA CONSIDERATIONS DURING AN EMERGENCY	8

EMERGENCY EXPOSURE EXTENSION REQUEST FORM and
POTASSIUM IODIDE TRACKING FORM can be found immediately following
EP-AD-000-125.

**PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND
PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE
(continued)**

CHECK ☐

1.0 Limits for EMERGENCY doses.

- ☐ **1.1 An EMERGENCY DOSE AUTHORIZATION** (see EMERGENCY EXPOSURE EXTENSIONS) may be granted in order to protect facilities, and or equipment to substantially limit the escape of radioactive effluents or control fires. The maximum planned doses are:
 - 1.1.1 Whole body (TEDE)⁽¹⁾ dose shall not exceed 10 Rem.
 - 1.1.2 Dose to any organ (CDE)⁽²⁾, including the skin and extremity (SDE)⁽³⁾, shall not exceed 100 Rem.
 - 1.1.3 Dose to the lens of the eye shall not exceed 30 Rem (LDE)⁽⁴⁾.
- ☐ **1.2 An EMERGENCY dose authorization** may be granted for life-saving actions or protection of large populations. The maximum doses are:
 - 1.2.1 Planned whole body (TEDE)⁽¹⁾ doses shall not exceed 25 Rem.
 - 1.2.2 Planned dose to any organ (CDE)⁽²⁾, including skin and extremity doses, shall not exceed 250 Rem.
 - 1.2.3 Dose to the lens of the eye shall not exceed 75 Rem (LDE)⁽⁴⁾.
- 1.3 RARE** situations may occur in which a dose **GREATER THAN** those specified in SECTION 1.2 above for emergency dose would be unavoidable to carry out a lifesaving operation or to avoid extensive exposure of large populations. It is not possible to prejudge the risk that one should be allowed to take to save lives of others, therefore no upper limit has been established.

- (1) The sum of the Effective Dose Equivalent resulting from the exposure to external sources and the committed effective Dose Equivalent incurred from all significant inhalation pathways during the early phase.
- (2) The Committed Dose Equivalent to the thyroid from radioiodine.
- (3) Shallow Dose Equivalent.
- (4) Lens Dose Equivalent.

PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE (continued)

CHECK ☐

- 2.0 For any **EMERGENCY EXPOSURE OR ACCIDENTAL OVEREXPOSURE**, the assessment actions in step 2 of the EMERGENCY EXPOSURE EXTENSIONS must be performed.

3.0 PROTECTIVE ACTIONS

☐ 3.1 Potassium Iodide

- 3.1.1 For emergency workers entering areas where a committed dose equivalent, (CDE)⁽²⁾, to the thyroid from radioiodine could be 25 Rem or greater, the **Consulting Radiological Physician** should provide input concerning the administration and cessation of KI intake. (See Emergency Telephone Directory for telephone number.)
- 3.1.2 For thyroid exposures that are strongly expected to exceed 25 Rem, (CDE)⁽²⁾, KI doses of 130 mg (100 mg - iodine) per day should be administered.

Unless the **EMERGENCY DIRECTOR** or **RECOVERY MANAGER** instructs personnel to do otherwise, the KI tablets should generally be taken as soon as possible after thyroid exposure exceeding 25 Rem (CDE)⁽²⁾ is projected.

NOTE: Stable Iodine (KI) is most effective when administered immediately prior to exposure to radioiodine. Significant blockage of the thyroid dose can be provided by administration within one or two hours after uptake of radioiodine.

- (1) The sum of the Effective Dose Equivalent resulting from the exposure to external sources and the committed effective Dose Equivalent incurred from all significant inhalation pathways during the early phase.
- (2) The Committed Dose Equivalent to the thyroid from radioiodine.
- (3) Shallow Dose Equivalent.
- (4) Lens Dose Equivalent.

**PP&L EMERGENCY PERSONNEL DOSE ASSESSMENT AND
PROTECTIVE ACTION RECOMMENDATION (PAR) GUIDE
(continued)**

CHECK ☐

- 3.1.3 Onsite issuance of KI for iodine prophylaxis requires the approval of the **EMERGENCY DIRECTOR**. Issuance to EOF and FIELD EMERGENCY MONITORING/SAMPLING TEAM personnel requires the approval of the **RECOVERY MANAGER** when the EOF has relieved the TSC of emergency management activities. The **EMERGENCY DIRECTOR** will approve issuance prior to that time. These approvals must be documented on the **POTASSIUM IODIDE (KI) TRACKING FORM**.
- 3.1.4 For an injured and/or contaminated worker sent to a hospital for treatment, the patient will be under the care of the attending physician. As such, plant procedures no longer apply and KI issuance will be at the discretion of the attending physician. The physician can rely on a senior Health Physics Technician Level II or Health Physics Management to provide the in-plant radiological data on which to base their decision.

- ☐ 3.2 Protective measures should be implemented for EOF personnel at the direction of the **DOSE ASSESSMENT SUPERVISOR**.
- ☐ 3.3. Exposures to members of local offsite support groups, (ambulance workers, fire fighters) shall not exceed 500 mrem (TEDE)⁽¹⁾ for the performance of support duties on the site of the Susquehanna SES.

4.0 EMERGENCY EXPOSURE NOTIFICATIONS AND A HEALTH CONSEQUENCE INVESTIGATION must be conducted for any emergency exposure as outlined in step 6 of the Emergency Exposure Extensions.

- (1) The sum of the Effective Dose Equivalent resulting from the exposure to external sources and the committed effective Dose Equivalent incurred from all significant inhalation pathways during the early phase.
- (2) The Committed Dose Equivalent to the thyroid from radioiodine.
- (3) Shallow Dose Equivalent.
- (4) Lens Dose Equivalent.

EMERGENCY EXPOSURE EXTENSIONS

CHECK ☐

1. Fill out the attached EMERGENCY EXPOSURE EXTENSION REQUEST Form.

2. Review the following factors:

- ☐ Rescue personnel should be volunteers or professional rescuers.
- ☐ Other considerations being equal (e.g., skill, potential need for person on another mission) personnel above the age of 45 are preferred.
- ☐ Rescue personnel should be familiar and briefed with the consequences of exposure.
- ☐ Women capable of reproduction should not take part in an effort requiring EMERGENCY exposure.
- ☐ Use of personnel with high lifetime cumulative exposure should be discouraged.
- ☐ All reasonable measures must be taken to control contamination and internal exposure.
- ☐ Exposure under these conditions shall be limited to once in a lifetime.
- ☐ For exposures greater than 25 Rem whole body (TEDE), the persons undertaking any emergency operation in which the dose will exceed 25 Rem to the whole body (TEDE) should do so only on a voluntary basis and with full awareness of the risks involved, including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of the risk of delayed effects. See the following two tables for general information concerning Health Effects & Cancer Risks.

EMERGENCY EXPOSURE EXTENSIONS (continued)

CHECK ☐

Health Effects Associated with Whole Body Absorbed Doses Received Within a Few Hours^(a)

Whole Body Absorbed Dose (rad)	Early Fatalities ^b (percent)	Whole Body Absorbed Dose (rad)	Prodromal Effects ^c (percent affected)
140	5	50	2
200	15	100	15
300	50	150	50
400	85	200	85
460	95	250	98

^a Risks will be lower for protracted exposure periods.

^b Supportive medical treatment may increase the dose at which these frequencies occur by approximately 50 percent.

^c Symptoms (nausea, vomiting) which occur within a few hours after exposure to large doses of radiation and which usually precede more serious health effects.

Approximate Cancer Risk to Average Individuals from 25 Rem Effective Dose Equivalent Delivered Promptly

Age at Exposure (years)	Approximate Risk of Premature Death (deaths per 1,000 persons exposed)	Average Years of Life Lost if Premature Death Occurs (years)
20 to 30	9.1	24
30 to 40	7.2	19
40 to 50	5.3	15
50 to 60	3.5	11

3. Review the HEALTH PHYSICS AND ALARA CONSIDERATIONS DURING EMERGENCIES which is attached.

4. Obtain appropriate approval signatures as outlined in the table below.

EXTENSION		APPROVAL	ACTIONS
FROM mrem (TEDE)	TO mrem (TEDE)		
4000	<25000	ED and RPC/RM and DASU	ALARA REVIEW AND APPLY EMERGENCY EXPOSURE CONSIDERATIONS
>25000		ED and RPC/RM and DASU	ALL OF ABOVE AND BRIEFING ON RISKS

EMERGENCY EXPOSURE EXTENSIONS (continued)

CHECK ☐

5. If the Emergency Dose Extension is for greater than 4 Rem (TEDE), have the volunteer sign the EMERGENCY EXPOSURE REQUEST Form acknowledging that they are a volunteer and are fully aware of the radiological risks of acute and delayed effects.
6. Upon completion of the activity requiring the Emergency Exposure perform the following:
 - ☐ Collect, process, and evaluate personnel dosimetry devices when technically appropriate.
 - ☐ Investigate the circumstances of all emergency exposures and confirm the dose received.
 - ☐ Notify the NRC of emergency exposure as follows:

Immediate notification of the NRC is required for:

- a. Exposure of the whole body of greater than 25 Rem (TEDE); or
- b. Exposure of the skin of the whole body of greater than 150 Rem (SDE); or
- c. Exposure of the extremities of greater than 375 Rem (SDE).

Notification of the NRC **within 24 hours** is required for:

- a. Exposure of the whole body of greater than 5 Rem (TEDE); or
 - b. Exposure of the skin of the whole body of greater than 30 Rem (SDE); or
 - c. Exposure of the extremities of greater than 75 Rem (SDE).
- ☐ Assess the health consequences of all emergency exposures. Consult with a physician to determine the need for and extent of physical and biochemical examinations.
 - ☐ Whole body greater than 25 Rem (TEDE) should result in an examination of the exposed person by a physician.
 - ☐ If internal exposure is suspected, quantitative measurements should be made immediately. Bioassays are required based on the following:
 - Nasal smear or facial contamination greater than 1,000 cpm above background.
 - Greater than 4 DAC-HRS in a day or less, or 20 DAC-HRS in a week or less.

HEALTH PHYSICS AND ALARA CONSIDERATIONS DURING EMERGENCIES

CHECK ☐

1.0 Evaluate radiological conditions.

☐ 1.1 Obtain detailed survey data to ascertain:

1.1.1 Beta-Gamma radiation levels

1.1.2 Need for neutron measurements

1.1.3 Contamination levels and protective clothing requirements

1.1.4 Airborne radioactive materials

1.1.5 Variability of conditions over space and time

☐ 1.2 Evaluate personnel status.

1.2.1 Determine available dose under normal administrative dose objectives.

1.2.2 If essential, obtain approval from RADIATION PROTECTION COORDINATOR/EMERGENCY DIRECTOR for persons expected to exceed administrative objectives.

1.2.3 Follow criteria in PP&L Emergency Personnel Dose Assessment and Protective Action Recommendation Guide when emergency exposures are deemed appropriate by EMERGENCY DIRECTOR.

1.2.4 Assess individual's history of exposure to airborne materials.

1.2.5 Assess individual's skills in relation to proposed task.

1.2.6 Assess individual's lifetime exposure history.

HEALTH PHYSICS AND ALARA CONSIDERATIONS DURING EMERGENCIES (continued)

CHECK ☐

- ☐ 1.3 Determine proper type and placement of dosimeters.

1.3.1 Evaluate need for additional whole body dosimeters.

NOTE: For emergency exposures above 4 rem, the placement of several dosimeters on an individual is recommended to determine spatial distribution of dose to the individual.

1.3.2 Evaluate need and placement of extremity dosimeters.

1.3.3 Evaluate need for additional dosimetry devices such as high range self-reading dosimeters, electronic dosimeters, and neutron dosimeters.

1.3.4 Evaluate need for time keeping.

- ☐ 1.4 Determine proper respirator equipment required to perform task.

NOTE: For tasks expected to last more than several hours, consider need for relief of team members.

- ☐ 1.5 Review the following ALARA items:

NOTE: The detail and scope of ALARA reviews are to be commensurate with the magnitude of doses expected, numbers of people involved, and urgency of required task.

1.5.1 Consider the trend of exposures vs. the importance of the task:

- a. Important and critical task with rising exposure rates will require the dispatch of teams as quickly as possible to reduce exposures.
- b. Unimportant or less critical task could be delayed until exposure rates begin to trend downward.

**HEALTH PHYSICS AND ALARA CONSIDERATIONS
DURING EMERGENCIES
(continued)**

CHECK ☐

- 1.5.2 When time permits the following should be included in the ALARA review:
- a. Consider the use of remote handling devices or other special tools.
 - b. Consider the use of portable shielding.
 - c. Consider the need for mock-ups or other practice exercises.
 - d. Assess the number of people required to assure all have essential productive roles.
 - e. Consider the magnitude of doses received by team members in transit to work location.

PREPARATION FOR INDIA TEAM DISPATCH

1. Upon identification of the need to assemble and dispatch teams during an emergency condition, the Health Physics Specialist will:
 - a. Assemble and evaluate existing and potential radiological conditions that will relate to the team's activities.
 - b. Consider how teams will access areas where elevated dose rates exists; in addition, consider a low dose approach where possible.
 - c. Consult with appropriate TSC Coordinators on the activities to be performed and the radiological conditions present to arrive at an estimated exposure for team members.
 - d. Obtain current YTD dose information for team members and evaluate the need for an exposure extension for emergency exposures.
 - (1) INDIA team members are permitted to accumulate doses up to 4 rem once entry into the Emergency Plan occurs.
 - e. Contact the Radiation Protection Coordinator when exposure extensions for emergency exposure in excess of 4 rem authorizations are required.
 - f. Review (or prepare) the Emergency Plan RWP for the activity to be performed.
 - (1) Description of task.
 - (2) Protective clothing and respiratory requirements.
 - (3) Dosimetry requirements (specify Alarm set points for PADs).
 - (4) Any special precautions.
 - g. Utilize the Emergency Plan RWP (YYYY-8000) to track team members and their exposure.
 - (1) Use the RWP REMARKS LOG to specify and document:

PAD Settings, Dress Requirements, Dosimetry, Engineering Controls, or other requirements.
 - h. Verify respirator qualifications, as necessary.

PERSONNEL ACCOUNTABILITY
(As defined in SP-00-309, Personnel Accountability)

ACCOUNTABILITY READER LOCATIONS

SITE BUILDING	READER LOCATION
Service & Administration Building – North	S&A Cafeteria
	S&A Large Conference Room 2nd Floor
	Effluents Management Meeting Area
	Facilities Management Meeting Area
Warehouse Facility	Large Conference Room 2nd Floor
South Building – Two Story	First Floor
	Main Hallway – East Doorway
	Main Hallway – West Doorway
	Main Hallway – Center
	Second Floor
	Main Hallway – North Exit
	Main Hallway – South Exit
	Main Hallway – West Exit
South Building – Three Story	First Floor
	North End Near Elevator
	South End Near Doorway to Maintenance
	Center Hallway
	Second Floor
	North End Near Elevator
	South End Near West Stairway
	Third Floor
	North End Near Elevator
	South End Near West Stairway

PERSONNEL ACCOUNTABILITY AREAS AND LEADER ASSIGNMENTS

Accountability Area Designator	Accountability Area	Work Groups	Accountability Area Leader
ACCOUNTABILITY AREA A	S&A Building Cafeteria ETN 254-1624	All Personnel located in S&A Building All floors except those noted in Assembly Area B	PRIMARY: Industrial Safety Supervisor
ACCOUNTABILITY AREA B	Effluents Management Meeting Area ETN 254-1644	Effluents Management Facilities Management Chemistry Admin ISI-ISD	PRIMARY: Effluents Mgmt. Supervisor
ACCOUNTABILITY AREA C	Warehouse Large Conference Room ETN 254-3186	Procurement	PRIMARY: Mgr.-Nuc Procurement
ACCOUNTABILITY AREA D	Electrical Maintenance I&C Shop 1 st Floor Two Story South Building ETN 254-3713	All Personnel located in the Two Story South Building	PRIMARY: Production Supervisor I&C
ACCOUNTABILITY AREA E	Cafeteria Conference Room 1 st Floor Three Story South Building ETN 254-1685	All Personnel located on the 1 st Floor of the Three Story South Building	PRIMARY: Production Supervisor Maintenance
ACCOUNTABILITY AREA F	Conference Room 211 2 nd Floor of the Three Story South Building ETN 254-1211	All Personnel located on the 2 nd and 3 rd Floor of the Three Story South Building	PRIMARY: Radiation Protection Manager
ACCOUNTABILITY AREA G	Technical Support Center Control Structure Elevation 741 ETN 254-3045	All Personnel Responding to Fill Emergency Plan Positions in the TSC	PRIMARY: TSC Administrative Coordinator

ACCOUNTABILITY ROSTER

ACCOUNTABILITY AREA: _____

DATE: / /

ACCOUNTABILITY AREA LEADER: _____

[illegible]

INSTRUCTIONS:

1. The **Accountability Area Leader** will direct all personnel in the assembly area to complete this roster in the event the Accountability Card Reader system is inoperable.
2. **On-site Personnel** will print their name and SSES badge number in the areas provided on this form.
3. After completion, notify **Security** and follow their direction to forward the rosters.