RTYPE H8.24

PILGRIM NUCLEAR POWER STATION

Procedure No. EP-IP-440

EMERGENCY EXPOSURE CONTROLS

Stop
Think
Act
Review

REFERENCE USE

REVISION LOG

REVISION 11 **Date Originated 1/16**

Pages Affected	Description
9	Change "TLD" to "DLR"
13	Add the JIC Forms File Box and the CTC Assembly Area Supply Cabinet as locations that KI is stored per WT-WTPNP-2015-247 CA-1.

REVISION 10 **Date Originated 10/14**

Pages Affected	Description
6	Add EN-EP-313, *"Offsite Dose Assessment using the Unified RASCAL Interface"* to References.
6	Update current title of NCRP to "National Council on Radiation Protection and Measurements".
6	Correct title of NCRP Report 39 to "Radiation Protection Criteria".
6	Clarify "U.S." Food and Drug Administration.
8,20	Clarify KI is potassium iodide.
8-10	Add titles to referenced Sections and Attachments of procedure.
8	Clarify PNPS administrative exposure guidelines.
10,14,15	Clarify RAC is Radiological Assessment Coordinator.
10	Change "PCs and Respiratory Protection" to actual wording on Emergency Radiological Controls Form of "Protective Clothing & Respiratory Protection"
11	Make editorial correction of "to" to "for".
12,13	Clarify SAMPLE wording and add Alternative TSC/OSC as location of installation.
13	Change dose assessment computer application reference from DAPAR to URI and add EN-EP-313 for instruction.

REVISION 10 (cont.) **Date Originated 10/14**

Pages Affected	Description
14	Change location of KI from OSC Medical Locker to TSC Communications Cabinet and change EOF Medical Locker to actual labeling of Decontamination Equipment Cabinet.
15	Change "Emergency Worker Exposure Record" to correct title of "Emergency Worker Exposure Record/Dose Card".
15	Change "Manager, Emergency Preparedness" to "Emergency Planning Manager".
20	Clarify "Coordinator" is "Radiological Coordinator".
20	Remove reference to Attachment 4 as the Food and Drug Administration Approved Package Insert is now part of the Attachment.
22	Correct document titles in Document Cross-Reference, Attachment 6.

REVISION 9 **Date Originated 4/10**

Pages Affected	Description
9,10	Update to reflect changes to Rev. 35 of The PNPS Explain by Removing the Reference of Delegation by the ED to the EPM for authorizing individual dose in excess of lower limit emergency exposure and administration of KI.
11	Remove "when delegated" from [1].
7,12,13,14,18,19	Update titles from "Onsite and Offsite Radiological Supervisors" to "Radiological Coordinator and Radiological Assessment Coordinator (RAC)".
21	Update Document Cross-Reference by replacing EP-IP-230, "OSC Activation and Response", EP-IP-231, "Onsite Radiation Protection" and "EP-IP-251, "Offsite Radiation Protection" with EP-IP-262, "OSC Operations".

TABLE OF CONTENTS

1.0 PURPOSE

This Procedure provides guidelines and administrative controls for radiation exposure received by PNPS controlled emergency workers during the course of a declared emergency.

2.0 REFERENCES

[1] Environmental Protection Agency, EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents

[2] EN-EP-313, *"Offsite Dose Assessment using the Unified RASCAL Interface"*

[3] EP-PP-01, *"PNPS Emergency Plan"*

[4] International Atomic Emergency Agency (IAEA), Technical Report No. 152, Evaluation of Radiation Emergencies and Accidents

[5] National Council on Radiation Protection and Measurements (NCRP) Report 39, Radiation Protection Criteria

[6] National Council on Radiation Protection and Measurements (NCRP) Report 55, Protection of the Thyroid Gland in the Event of Releases of Radioiodine

[7] The Food and Drug Administration Approved Patient Package Insert for Commercially Packaged Potassium Iodide

[8] U.S. Food and Drug Administration (Health & Human Services), Guidance - Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies, December 2001

3.0 DEFINITIONS

[1] Corrective Action - Includes surveillance and/or assessment actions and plant operations necessary to minimize further deterioration of the level of plant safety or to mitigate the consequences of the accident, if failure to perform these actions could result in a significant increase in offsite exposures.

[2] Emergency Exposure - Radiation exposure received by an emergency worker conducting accident mitigating or life saving actions during a declared emergency.

[3] Emergency Exposure Limits

Dose Limit*	Activity	Conditions
5 rem	All	
10 rem	Protecting valuable property.	Lower dose not practical.
25 rem	Life saving or protection of large populations.	Lower dose not practical.
> 25 rem	Life saving or protection of large populations.	Only on a voluntary basis to persons fully aware of the risks involved.

* EPA TEDE values for nonpregnant adults from exposure and intake during an emergency situation in rem. Workers performing services during emergencies should limit dose to the eyes to three times the listed value and dose to any other organ (including skin and body extremities) to ten times the listed value.

[4] Emergency Worker - An individual who holds an emergency response function as indicated by the PNPS Emergency Plan during a declared emergency.

[5] Life Saving Action - Actions related to the search for and rescue of injured persons, or corrective or protective actions to mitigate conditions which could result in imminent injury or substantial overexposure to an individual.

[6] Total Effective Dose Equivalent (TEDE) - Sum of the external Deep Dose Equivalent (DDE) and the internal Committed Effective Dose Equivalent (CEDE).

4.0 DISCUSSION

None

5.0 RESPONSIBILITIES

[1] The Emergency Director (ED), or the Emergency Plant Manager (EPM) when delegated, is responsible for the authorization of:

(a) Individual dose in excess of the lower emergency exposure limits.

(b) The administration of potassium iodide (KI).

[2] The Radiological Assessment Coordinator (RAC) and Radiological Coordinator are responsible for:

(a) Tracking dose received by the emergency workers during the course of the emergency.

(b) Ensuring that proper emergency exposure guidelines are followed by emergency workers.

(c) Evaluating, recognizing, and recommending the need for potassium iodide (KI).

6.0 PROCEDURE

6.1 DOSES ≤ THE LOWER EMERGENCY EXPOSURE LIMITS

[1] Individual exposure received over the course of the emergency shall be recorded and documented in accordance with Section 6.3, Emergency Exposure Documentation.

[2] From the time an emergency is declared, ERO personnel are considered emergency workers. Emergency workers are allowed to receive the following exposure over the course of the emergency, exclusive of previous exposure and without special authorization:

(a) 5 rem TEDE (whole body).

(b) 15 rem to the eyes.

(c) 50 rem to the skin, thyroid, and extremities.

[3] Radiation exposures to emergency personnel shall be maintained, when possible, within the PNPS administrative exposure guidelines.

[4] In order to maintain personnel exposures as low as possible, methods used during normal Station operation to control and minimize exposures, such as ALARA (As Low As Reasonably Achievable), shall remain in force during an emergency condition to the degree consistent with timely implementation of emergency measures.

[5] To assure adequate protection of minors and the unborn during emergencies, the performance of emergency activities should be limited to nonpregnant adults.

6.2 DOSES > THE LOWER EMERGENCY EXPOSURE LIMITS

[1] Individual exposure received over the course of the emergency shall be recorded and documented in accordance with Section 6.3, Emergency Exposure Documentation.

[2] Prior ED/EPM approval must be given for all emergency exposures anticipated to exceed 5 rem TEDE or to cause an individual to have accumulated greater than 5 rem TEDE over the course of the emergency.

[3] Pre-Exposure Evaluation: Consideration of the following guidelines shall be given prior to authorizing doses greater than the lower exposure limits:

(a) The risk of not performing the task shall be evaluated against the anticipated exposure.

(b) Dosimetry equipment capable of measuring the anticipated maximum exposure and type of radiation shall be worn by personnel receiving emergency exposures whenever possible.

(c) Personnel shall not enter any area where dose rates are unmonitored or immeasurable.

(d) Where practical, all attempts shall be made to keep emergency exposures ALARA (for example, use of protective clothing, respiratory protection, thyroid blocking agent).

[4] Personnel undertaking any emergency operation in which the dose will exceed 25 rem to the whole body shall be identified by signature on the Emergency Volunteer Acknowledgment Form (Attachment 3) and should:

(a) Do so only on a voluntary basis.

(b) Be more than 45 years of age.

(c) Be made fully aware of the risks involved, including the numerical levels of dose at which acute effects of radiation exposure will be incurred and numerical estimates of the risks of delayed effects.

6.3 EMERGENCY EXPOSURE DOCUMENTATION

[1] Emergency exposure documentation for ERO personnel shall be maintained by the Radiological Assessment Coordinator (RAC) and Radiological Coordinator (as applicable). Individual exposures will be recorded on Attachment 1, Example - Emergency Worker Exposure Record/Dose Card, or other similar form to ensure adequate documentation and tracking during the course of the emergency.

[2] Activities in support of emergency efforts which involve emergency exposure must include a radiological briefing and will be documented through a Radiation Work Permit (RWP) or on an Emergency Radiological Controls Form (Attachment 2).

> NOTE
>
> Although it is preferable to document radiological controls prior to dispatching individuals on emergency related tasks, radiological controls and precautions may be provided verbally and documented as soon as possible thereafter.

[3] Radiological controls determined to be necessary for a task conducted during the emergency are documented on Attachment 2, Emergency Radiological Controls Form, as follows:

(a) Task Assignment: The task, number, location, and date are copied from the OSC Team Task Assignment Sheet or completed as appropriate (for tasks such as RMT dispatch).

> NOTE
>
> Prior ED/EPM approval must be given for all emergency exposures anticipated to cause an individual to have accumulated greater than 5 rem over the course of the emergency.

(b) Task Exposure (Individual) Estimate: The maximum expected dose to any single member of the team. Team members are instructed to either contact the team coordinator or to return prior to exceeding this dose. Consideration shall be given to the benefit of performing the task versus the exposure to be received by personnel when this value has been determined.

(c) Task Dose Rate Limit: The maximum expected whole body dose rate. Team members are to fall back to an area of lower dose rate and contact the team coordinator or return when this limit is encountered.

(d) Dosimetry: Describes any requirements beyond a DLR and SID. A DLR and SID are automatic requirements for all tasks involving radiological controls.

(e) Protective Clothing & Respiratory Protection: Denotes the necessary protective clothing and equipment required for the task.

(f) Suggested Route: Best or preferred route to the task site or the sequence to follow for tasks conducted at multiple locations.

(g) Anticipated Conditions: Radiation, contamination, and airborne conditions. Values need not be provided for tasks which could be hindered by stopping to conduct contamination and airborne surveys. When air sampling is required, ensure guidance is provided regarding:

(1) Sample location(s).

(2) Sample volume (collection time and flow rate).

(3) Analysis or counting method to be used.

(4) Actions for high exposure rates on collected samples.

(h) Survey Equipment and Maps: Describes any radiological equipment and logs or maps used to conduct surveys performed as part of or during the task.

(i) Special Instructions: Describes any additional radiological information or instructions necessary for the task.

[4] Task Exposure: The task exposure section is used to identify the individuals assigned to and track exposure received during conduct of the task. Current emergency dose will be checked against the task exposure estimate prior to team dispatch to ensure no exposure limits are exceeded without proper authorization.

NOTE

Although it is preferable to document authorization prior to tasks which allow extended exposure, authorization may be granted verbally and documented as soon as possible thereafter.

[5] Extended Exposure: The extended exposure section provides authorization by the Emergency Director (or Emergency Plant Manager for onsite ERO personnel) prior to activities which would result in doses greater than the lower emergency limits.

(a) If the task exposure estimate will result in an individual's emergency exposure exceeding 5 rem, an extended limit must be determined and authorized.

(b) Extended emergency exposures for life saving or protection of large populations anticipated to exceed 25 rem must include additional briefing and documentation in accordance with the Emergency Volunteer Acknowledgment Form (Attachment 3).

6.4 POSTEXPOSURE EVALUATION

[1] EPA-400 specifies that emergency exposures received during an emergency are considered a once-in-a-lifetime exposure and are not added to occupational exposure accumulated under nonemergency conditions.

[2] 10CFR20 specifies doses received during emergencies must be subtracted from the limits for Planned Special Exposures that the individual may receive during the current year and during the individual's lifetime.

[3] Individuals receiving doses beyond the lower exposure limits shall be restricted from further occupational (nonemergency) radiation exposure pending the outcome of exposure evaluations and medical surveillance.

[4] The Entergy Medical Department shall be contacted for follow-up care and further evaluation, as required.

6.5 ADMINISTRATION OF POTASSIUM IODIDE (KI)

[1] The Emergency Director or the Emergency Plant Manager shall be responsible for authorizing the administration of KI to PNPS emergency workers.

NOTE

KI is 90% effective in blocking the uptake of radioiodine by the thyroid if administered within the first hour of uptake, and is 50% effective if administered within 4 hours after uptake. Almost no benefit will be obtained if KI is administered 10 to 14 hours after exposure; therefore, it shall not be administered after such a duration.

[2] KI should be considered as a potential dose reducing option for any situation in which airborne radioactive iodine is present (an additional ALARA option).

[3] Dose Determination: KI should be administered to emergency workers if by calculation, measurement, or estimation the total dose to the thyroid will exceed 10 rem.

(a) The isotopic halogen concentrations must be determined before a thyroid dose can be estimated. Concentrations can be determined by direct measurement of each isotope or by estimations based on a known I-131 concentration.

(1) Concentration estimations can be determined as follows:

- By the use of the Halogen Concentration Worksheet (Attachment 4).
- Through the use of the Excel spreadsheet file SAMPLE. SAMPLE is installed on the TSC Core Damage computer (Classroom 8 computer at the Alternative TSC/OSC) and the EOF Dose Assessment computers.

(2) When estimated concentrations are used, the estimations should be confirmed by direct measurement as soon as practical.

(3) The sample data and calculation sections are used to determine I-131 activity if an NaI equipped E-600 (or equivalent) is used to analyze the I-131 concentration. Otherwise, the I-131 concentration can be entered directly.

(4) Accident type is determined by the Reactor or Core Damage Engineer in the TSC. If the accident type is unknown, assume a gap release.

(b) Thyroid dose can be estimated from isotopic concentrations (in μCi/cc) as follows:

(1) Direct Calculation

$$\textbf{Thyroid Dose}_i = Concentration_i \times DCF_i \times \left(\frac{-1}{\lambda} \times e^{-\lambda t} + \frac{1}{\lambda}\right)$$

Isotope	$DCF\left(\frac{rem \bullet cm^3}{\mu Ci \bullet hr}\right)$	$\lambda(hr^{-1})$
I-131	1.3E+06	3.59E-03
I-132	7.7E+03	3.01E-01
I-133	2.2E+05	3.33E-02
I-134	1.3E+03	7.88E-01
I-135	3.8E+04	1.05E-01
Te-132	2.9E+05	8.86E-03

Where t = exposure period in hours.

Total thyroid dose is the sum of the individual doses from each of the isotopes above.

(2) Through the use of the Excel spreadsheet file titled SAMPLE. SAMPLE is installed on the TSC Core Damage computer (Classroom 8 computer at the Alternative TSC/OSC) and the EOF Dose Assessment computers.

(3) Through the use of the dose assessment computer application titled Unified RASCAL Interface (URI) in accordance with EN-EP-313, *"Offsite Dose Assessment using the Unified RASCAL Interface"*. URI is installed on computers in the Control Room and the EOF.

[4] Issuing KI: The Radiological Assessment Coordinator or Radiological Coordinator as applicable, shall:

NOTE

The Emergency Director or, when delegated to, the Emergency Plant Manager shall be responsible for authorizing the administration of KI to PNPS emergency workers.

(a) Ensure approval and documentation are recorded on the Potassium Iodide Administration Form (Attachment 5).

CAUTION

Individuals who have known allergies to iodide shall NOT be issued KI.

(b) Notify those who are to receive KI to report to a designated location for distribution.

(c) Issue one 130 mg KI tablet to each individual who is to receive KI. KI is stored in the TSC Communications Cabinet, the EOF Decontamination Equipment Cabinet, the JIC Forms File Box, and the CTC Assembly Area Supply Cabinet. Additional supplies are also located in the Medical Department.

(d) Contact the Entergy Medical Department and request follow-up care and further guidance concerning KI administration.

(e) Instruct individuals to take one 130 mg KI tablet daily for 10 days or as directed by the Entergy Medical Department and record each issuance on the Potassium Iodide Administration Form (Attachment 5).

7.0 RECORDS

[1] The following documents may be generated by the implementation of this Procedure:

(a) Emergency Worker Exposure Record/Dose Card

(b) Emergency Radiological Controls Form

(c) Emergency Volunteer Acknowledgment Form

(d) Halogen Concentration Worksheet

(e) Potassium Iodide Administration Form

[2] Completed documents shall be collected by the Radiological Assessment Coordinator or the Radiological Coordinator as applicable, who reviews and submits all records to the Emergency Planning Manager.

8.0 ATTACHMENTS

ATTACHMENT 1 - EXAMPLE - EMERGENCY WORKER EXPOSURE RECORD/DOSE CARD

ATTACHMENT 2 - EMERGENCY RADIOLOGICAL CONTROLS FORM

ATTACHMENT 3 - EMERGENCY VOLUNTEER ACKNOWLEDGMENT FORM

ATTACHMENT 4 - HALOGEN CONCENTRATION WORKSHEET

ATTACHMENT 5 - POTASSIUM IODIDE ADMINISTRATION FORM

ATTACHMENT 6 - DOCUMENT CROSS-REFERENCE

ATTACHMENT 7 - IDENTIFICATION OF COMMITMENTS

EXAMPLE - EMERGENCY WORKER EXPOSURE RECORD/DOSE CARD

PNPS EMERGENCY DOSE CARD

LAST FIRST M.I.

NAME:

SLOT #	SID SERIAL #
DATE:	AVAILABLE DOSE

TASK #	SID IN	SID OUT	TASK DOSE	TOTAL DOSE

EMERGENCY RADIOLOGICAL CONTROLS FORM

Assignment

Task:	**No:**
Location:	**Date:**

Radiological Controls

Task Exposure (Individual) **Estimate:**	**Task Dose Rate Limit:**	**Dosimetry** (TLD and SID as a minimum) **:**

Protective Clothing & Respiratory Protection:

- ☐ None
- ☐ Other (see below)
- ☐ Cotton Liners
  Rubber Gloves
  Shoe Covers
  Rubbers
- ☐ Lab Coat
- ☐ Full PCs
- ☐ Full Face Part
- ☐ Full Face Part/Iod
- ☐ SCBA

Suggested Route:

Anticipated Conditions:	**Enroute**	**At Location**
Radiation (mR/hr)		
Contamination		
Airborne		

Survey Equipment and Maps:

Special Instructions (attach additional pages if necessary):

Task Exposure

Team Member Name	Current Emergency Dose	SID Dose In	SID Dose Out	Task Dose

Extended Exposure

Task Requires an Individual's Emergency Exposure to Exceed 5 Rem:

☐ No ☐ Yes **Extended Limit:**

Authorization (ED or EPM):	**Time:**

EMERGENCY VOLUNTEER ACKNOWLEDGMENT FORM

Assignment	
Task:	**No:**
Location:	

Health Effects associated with Whole Body Absorbed Doses Received Within a Few Hours[a] (Acute Dose)		
Dose (Rad)	% Precursory Effects[b]	% Early Fatalities[c]
50	2	
100	15	
140		5
150	50	
200	85	15
250	98	
300		50
400		85
460		95

a Risks will be lower for protracted exposures.
b Forewarning symptoms of more serious health effects associated with large doses of radiation.
c Supportive medical treatment may increase the dose at which these frequencies occur by approximately 50 percent.

Approximate cancer Risk to Average Individuals from 25 Rem Acute Exposure		
Age at Exposure (years)	Approximate risk of premature death (deaths per 1000 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

I have been briefed on the radiological consequences and hazards associated with the authorized emergency exposure, and I have volunteered to perform the task described.

Name: _____ Signature: _____ Date: _____

Name: _____ Signature: _____ Date: _____

Name: _____ Signature: _____ Date: _____

Name: _____ Signature: _____ Date: _____

Note: Detailed information for the above tables is located in Appendix B and Appendix C of EPA-400

HALOGEN CONCENTRATION WORKSHEET

Halogen Concentration Worksheet

Calculations Performed By

Name: _____ **Date:** _____

Sample Data		
Gross Sample Count Rate (CPM)	A.	
Background Count Rate #1 (CPM)	B.	
Background Count Rate #2 (CPM)	C.	
Meter Efficiency (%)	D.	
Sample Duration (min)	E.	
Sample Flow (scfm)	F:	
Time After Shutdown (hrs)	G:	
Accident Type (G or M)	H:	

Sample Calculations		
Average Background = (B + C) / 2	J:	
Net Counts = A - J	K:	
Sample Correction = D x E x F	L:	

Isotopic Concentrations		uCi/cc	Ratio
I-131 = (K / L) x 1.59E-09	M:		N/A
I-132 = Table Ratio x M			
I-133 = Table Ratio x M			
I-134 = Table Ratio x M			
I-135 = Table Ratio x M			
Te-132 = Table Ratio x M			

Time After Shutdown	I-132	I-133	I-134	I-135	Te-132 (Gap)	Te-132 (Melt)
0	1.45	2.09	2.31	1.95	0.01	12.63
1	1.45	2.05	1.63	1.76	0.01	12.54
2	1.44	2.00	0.96	1.59	0.01	12.47
3	1.44	1.94	0.52	1.44	0.01	12.41
4	1.43	1.89	0.26	1.30	0.01	12.34
5	1.43	1.83	0.13	1.17	0.01	12.28
6	1.43	1.78	0.06	1.06	0.01	12.21
7	1.42	1.73	0.03	0.96	0.01	12.15
8	1.41	1.68	0.01	0.87	0.01	12.08
16	1.35	1.32	0.00	0.38	0.01	11.58
24	1.30	1.04	0.00	0.17	0.01	11.11
48	1.14	0.51	0.00	0.01	0.01	9.79
72	1.01	0.25	0.00	0.00	0.01	8.62
96	0.89	0.12	0.00	0.00	0.01	7.60
120	0.78	0.06	0.00	0.00	0.00	6.70
144	0.69	0.03	0.00	0.00	0.00	5.90
168	0.61	0.01	0.00	0.00	0.00	5.20

*Mix ratio assumes end of core life source term.

POTASSIUM IODIDE ADMINISTRATION FORM

Name: _____ SSN: _____
(Last) (MI) (First)

I-131 Concentration (µCi/cc area) _____ µCi/cc

Duration of Exposure: _____ Hours

Project Thyroid Dose (Estimated): _____ Rem

Respiratory Protection Worn: ☐ Yes ☐ No Protection Factor: _____

Determined by: _____ Time: _____
Radiological Coordinator/RAC

Approved by: _____ Time: _____
ED/EPM

I have read and understand the precautions in the Food and Drug Administration Approved Package Insert that follows and understand that taking potassium iodide (KI) is voluntary. I also verify to the best of my knowledge I have no known allergies to iodide.

Signature of Individual Taking KI:

KI Administration Record

Date	Time	Issued By

POTASSIUM IODIDE ADMINISTRATION FORM (CONT.)

THE FOOD AND DRUG ADMINISTRATION APPROVED PACKAGE INSERT

THYRO-BLOCK®
TABLETS
(POTASSIUM IODIDE TABLETS, USP)
(pronounced poe-TASS-e-um EYE-oh-dyed)
(abbreviated: KI)

TAKE POTASSIUM IODIDE ONLY WHEN PUBLIC HEALTH OFFICIALS TELL YOU. IN A RADIATION EMERGENCY, RADIOACTIVE IODINE COULD BE RELEASED INTO THE AIR. POTASSIUM IODIDE (A FORM OF IODINE) CAN HELP PROTECT YOU.

IF YOU ARE TOLD TO TAKE THIS MEDICINE. TAKE IT ONE TIME EVERY 24 HOURS. DO NOT TAKE IT MORE OFTEN. MORE WILL NOT HELP YOU AND MAY IN-CREASE THE RISK OF SIDE EFFECTS. *DO NOT TAKE THIS DRUG IF YOU KNOW YOU ARE ALLERGIC TO IODINE.* (SEE SIDE EFFECTS BELOW.)

INDICATIONS

THYROID BLOCKING IN A RADIATION EMERGENCY ONLY.

DIRECTIONS FOR USE

Use only as directed by State of local public health authorities in the event of a radiation emergency.

DOSE

Tablets: ADULTS AND CHILDREN 1YEAR OF AGE OR OLDER: One (1) tablet once a day. Crush for small children. BABIES UNDER 1 YEAR OF AGE: One-half (1/2) tablet once a day. Crush first.

Take for 10 days unless directed otherwise by State or local public health authorities.

Store at controlled room temperature between 15° and 30° C (59° to 86° F). Keep container tightly closed and protect from light.

WARNING

Potassium iodide should not be used by people allergic to iodine. Keep out of the reach of children. In case of overdose or allergic reaction, contact a physician or the public health authority.

DESCRIPTION

Each THYRO-BLOCK® TABLET contains 130 mg of potassium iodide. Other ingredients: magnesium stearate, microcrystalline cellulose, silica gel, sodium thiosulfate.

HOW POTASSIUM IODIDE WORKS

Certain forms of iodine help your thyroid gland work right. Most people get the iodine they need from foods, like iodized salt or fish. The thyroid can "store" or hold only a certain amount of iodine.

In a radiation emergency, radioactive iodine may be released in the air. This material may be breathed or swallowed. It may enter the thyroid gland and damage it. The damage would probably not show itself for years. Children are most likely to have thyroid damage.

If you take potassium iodide, it will fill up your thyroid gland. This reduces the chance that harmful radioactive iodine will enter the thyroid gland.

WHO SHOULD NOT TAKE POTASSIUM IODIDE

The only people who should not take potassium iodide are people who know they are allergic to iodine. You may take potassium iodide even if you are taking medicines for a thyroid problem (for example, a thyroid hormone or anti-thyroid drug). Pregnant and nursing women and babies and children may also take this drug.

HOW AND WHEN TO TAKE POTASSIUM IODIDE

Potassium Iodide should be taken as soon as possible after public health officials tell you. You should take one dose every 24 hours. More will not help you because the thyroid can "hold" only limited amounts of iodine. Larger doses will increase the risk of side effects. You will probably be told not to take the drug for more than 10 days.

SIDE EFFECTS

Usually, side effects of potassium iodide happen when people take higher doses for a long time. You should be careful not to take more than the recommended dose or take it for longer than you are told. Side effects are unlikely because of the low dose and the short time you will be taking the drug.

Possible side effects include skin rashes, swelling of the salivary glands, and "iodism" (metallic taste, burning mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes stomach upset and diarrhea).

A few people have an allergic reaction with more serious symptoms. These could be fever and joint pains, or swelling of parts of the face and body and at times severe shortness of breath requiring immediate medical attention.

Taking iodine may rarely cause overactivity of the thyroid gland, underactivity of the thyroid gland, or enlargement of the thyroid gland (goiter).

WHAT TO DO IF SIDE EFFECTS OCCUR

If the side effects are severe or if you have an allergic reaction, stop taking potassium iodide. Then, if possible, call a doctor or public health authority for instructions.

HOW SUPPLIED

THYRO-BLOCK® TABLETS (Potassium Iodide Tablets, UPS) bottles of 14 tablets (NDC 0037-0472-20). Each white, round, scored tablet contains 130 mg potassium iodide.

WALLACE LABORATORIES
Division of
CARTER-WALLACE, INC.
Cranbury, New Jersey 08512

IN-0472-01 Rev 2/85

DOCUMENT CROSS-REFERENCE

This Attachment lists those documents, other than source documents, which may be affected by changes to this Procedure.

Document Number	Document Title
EP-IP-262	Operations Support Center (OSC) Operations
EP-IP-260	Emergency Operations Facility (EOF) Operations
EP-IP-261	Technical Support Center (TSC) Operations

IDENTIFICATION OF COMMITMENTS

This Attachment lists those external commitments (i.e., NRC commitments, QA audit findings, and INPO inspection items) implemented in this Procedure.

Reference Document	Commitment	Affected Section(s)/Step(s)
NRC Inspection Finding 84-05-16/85-19-01	Describe or reference by Procedure the program for exposure control during emergencies. Improve program for evaluation/control of re-entry team radiation exposure.	All

Procedure/Document Number: EP-IP-440	**Revision:** 11
Equipment/Facility/Other: Pilgrim Nuclear Power Station	
Title: Emergency Exposure Controls	

Part I. Description of Activity Being Reviewed This procedure revision:

1. Change "TLD" to "DLR". Page 9
2. Add "the JIC Forms File Box, and the CTC Assembly Area Supply Cabinet" as locations that KI is stored. Page 13

Part II. Activity Previously Reviewed? Is this activity fully bounded by an NRC approved 10 CFR 50.90 submittal or Alert and Notification System Design Report? If YES, identify bounding source document number/approval reference and ensure the basis for concluding the source document fully bounds the proposed change is documented below:	☐ YES 50.54(q)(3) Evaluation is NOT required. Enter justification below and complete Part VI.	☒ NO Continue to next part

Justification:

☐ Bounding document attached (optional)

Part III. Applicability of Other Regulatory Change Control Processes

APPLICABILITY CONCLUSION

☒ If there are no controlling change processes, continue the 50.54(q)(3) Screening.
☐ One or more controlling change processes are selected, however, some portion of the activity involves the emergency plan or affects the implementation of the emergency plan; continue the 50.54(q)(3) Screening for that portion of the activity. Identify the applicable controlling change processes below.
☐ One or more controlling change processes are selected and fully bounds all aspects of the activity. 50.54(q)(3) Evaluation is NOT required. Identify controlling change processes below and complete Part VI.

CONTROLLING CHANGE PROCESSES

10 CFR 50.54(q)

Part IV. Editorial Change Is this activity an editorial or typographical change such as formatting, paragraph numbering, spelling, or punctuation that does not change intent?	☐ YES 50.54(q)(3) Evaluation is NOT required. Enter justification and complete Part VI.	☒ NO Continue to next part

Justification:

Part V. Emergency Planning Element/Function Screen (Associated 10 CFR 50.47(b) planning standard function identified in brackets) Does this activity affect any of the following, including program elements from NUREG-0654/FEMA REP-1 Section II?

1. Responsibility for emergency response is assigned. [1]	☐
2. The response organization has the staff to respond and to augment staff on a continuing basis (24/7 staffing) in accordance with the emergency plan. [1]	☐
3. The process ensures that on shift emergency response responsibilities are staffed and assigned. [2]	☐
4. The process for timely augmentation of onshift staff is established and maintained. [2]	☐
5. Arrangements for requesting and using off site assistance have been made. [3]	☐
6. State and local staff can be accommodated at the EOF in accordance with the emergency plan. [3]	☐
7. A standard scheme of emergency classification and action levels is in use. [4]	☐

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8. Procedures for notification of State and local governmental agencies are capable of alerting them of the declared emergency within 15 minutes after declaration of an emergency and providing follow-up notifications. [5]	☐
9. Administrative and physical means have been established for alerting and providing prompt instructions to the public within the plume exposure pathway. [5]	☐
10. The public ANS meets the design requirements of FEMA-REP-10, Guide for Evaluation of Alert and Notification Systems for Nuclear Power Plants, or complies with the licensee's FEMA-approved ANS design report and supporting FEMA approval letter. [5]	☐
11. Systems are established for prompt communication among principal emergency response organizations. [6]	☐
12. Systems are established for prompt communication to emergency response personnel. [6]	☐
13. Emergency preparedness information is made available to the public on a periodic basis within the plume exposure pathway emergency planning zone (EPZ). [7]	☐
14. Coordinated dissemination of public information during emergencies is established. [7]	☐
15. Adequate facilities are maintained to support emergency response. [8]	☐
16. Adequate equipment is maintained to support emergency response. [8]	☐
17. Methods, systems, and equipment for assessment of radioactive releases are in use. [9]	☐
18. A range of public PARs is available for implementation during emergencies. [10]	☐
19. Evacuation time estimates for the population located in the plume exposure pathway EPZ are available to support the formulation of PARs and have been provided to State and local governmental authorities. [10]	☐
20. A range of protective actions is available for plant emergency workers during emergencies, including those for hostile action events.[10]	☐
21. The resources for controlling radiological exposures for emergency workers are established. [11]	☐
22. Arrangements are made for medical services for contaminated, injured individuals. [12]	☐
23. Plans for recovery and reentry are developed. [13]	☐
24. A drill and exercise program (including radiological, medical, health physics and other program areas) is established. [14]	☐
25. Drills, exercises, and training evolutions that provide performance opportunities to develop, maintain, and demonstrate key skills are assessed via a formal critique process in order to identify weaknesses. [14]	☐
26. Identified weaknesses are corrected. [14]	☐
27. Training is provided to emergency responders. [15]	☐
28. Responsibility for emergency plan development and review is established. [16]	☐
29. Planners responsible for emergency plan development and maintenance are properly trained. [16]	☐

APPLICABILITY CONCLUSION

☑ If no Part V criteria are checked, a 50.54(q)(3) Evaluation is NOT required; document the basis for conclusion below and complete Part VI. ☑

☐ If any Part V criteria are checked, complete Part VI and perform a 50.54(q)(3) Evaluation.

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BASIS FOR CONCLUSION

Activity 1: This activity changes references to a TLD (Thermoluminescent Dosimeter) to DLR (Dosimeter of Legal Record). DLR is the term that is used within Entergy and includes TLDs as described in Procedure EN-RP-201, Section 3.0 Definitions. This activity does not change intent, facilities, equipment or processes for this procedure or affect any planning standard elements. This activity does not affect the PNPS Emergency Plan. No further evaluation is required for this activity.

Activity 2: This activity adds the JIC Forms File Box at the Joint Information Center and the Chiltonville Training Center Assembly Area Supply Cabinet as additional locations where potassium iodide (KI) is stored. This activity was evaluated in the 50.54(q) Evaluation for revision 38 of EP-PP-01, PNPS Emergency Plan (attached) and it was found that there is no reduction in the effectiveness of the PNPS Emergency Plan by this activity. No further evaluation is required for this activity.

Part VI. Signatures:

Preparer Name (Print) James R Parmenter	Preparer Signature	Date: 1/6/16
(Optional) Reviewer Name (Print)	Reviewer Signature	Date:
Reviewer Name (Print) Duane White Nuclear EP Project Manager	Reviewer Signature	Date: 1-6-2016
Approver Name (Print) D M CALABRESE EP manager or designee	Approver Signature	Date: 1/6/2016

ENTERGY	10CFR50.54(q) Evaluation
1. ~~DOCUMENT/ACTIVITY~~ CHANGED: EP-PP-01, PNPS Emergency Plan	2. ~~REVISION NUMBER~~: Revision 38
3. EMERGENCY PLAN SECTION(S) OR PROCEDURE SECTION(S):	Sections B, F, H and P and Appendix 1.

4. REFERENCES:

1. 76FR72560, "Enhancements to Emergency Preparedness Regulations," Federal Register, Volume 76, p. 72560, Washington, DC, November 23, 2011
2. Regulatory Guide 1.219, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors", November, 2011
3. EN-EP-305, "Emergency Planning 10CFR50.54(q) Review Program"
4. CR-HQN-2011-0110, CA-66, issued 12/15/2011 and due date 4/30/2012
5. LO-WTHQN-2011-01386, CA-07, issued 12/7/2011 and due date 5/16/2012
6. INPO Event Report 11-39 L2 , "Lack of Timely ERO and ERF Activation", issued 9/15/2011

5. PROPOSED CHANGE(S):

This document evaluates the various changes to EP-PP-01, Revision 38 of the PNPS Emergency Plan, as a result of: 1) a NRC new requirement for amending the emergency plan change process under 10 CFR 50.54(q) stipulated with the rulemaking documents issued in November, 2011 (Ref. 1 and 2) and changes being made to EN-EP-305 (Ref. 3) that provides guidance to Entergy Nuclear Sites to implement the new requirement for the 10 CFR 50.54(q) review process for site Emergency Plans, 2) corporate directive (Ref. 4) to make consistent across the Entergy Fleet the term "operational" to depict the level of ERO augmentation and Emergency Response Facility (ERF) facility functionality, and 3) corporate directive (Ref. 5) to revise site plans to align with a Fleet KI Basis document and draft EN-EP document, "Use of KI for the Emergency Response Organization and 4) administrative addition of References 1 and 2 above to Appendix 1, References.

1) NRC Rulemaking Enhancements to Emergency Preparedness Regulations and guides issued in November, 2011 (Ref. 1 and 2) includes enhanced direction in the completion of emergency plan reviews and objectives under the 50.54(q) change process. The significant change within this new requirement under 10 CFR 50.54(q) processes that impacts the PNPS Emergency Plan is the replacement of the phrase "decrease in effectiveness" with "reduction in effectiveness". The impact to the PNPS Eplan itself is a minimal word change but this reflects the detailed change in intent of the assessment process under 10CFR50.54(q) being reflected in and required by the NRC new requirement for this regulation. These revisions are further reflected in EN-EP-305 (Ref.3).
The changes discussed above result in the following revisions to the EPlan:
Section P.4.
Revise: "decrease" to read "reduce" at three points within paragraph four.

2) A Corporate directive has been issued to the Entergy Fleet sites through CR-HQN-2011-

01100 CA-66 (Ref. 4) to "Revise individual site Emergency Response Facility activation criteria to include the single definition for activation/operability 'Operational' as contained in our response to IER 11-39 (Ref. 6)." This definition has been offered by corporate to read: "Operational: Status of an emergency facility declared by the appropriate facility lead position upon determining that the facility has sufficient personnel and that equipment is available to perform the emergency functions assigned to that facility." The use of the term "activate" within the PNPS Emergency Plan is currently used to denote several actions beyond the suggested use, to include the initial steps to render an Emergency Response Facility open and able to receive ERO members and with regard to initial mobilization of the ERO. The revision in those instances where the term "Activated" to "Operational" as used to reflect the ERF status as having sufficient personnel and processes to support the intended function of the facility clarifies and further defines the use of the term in this light, and reduces potential for confusion when communicating the status of the ability of the ERF to assume responsibilities in accordance with procedures.
These changes include revision to:
Sections B.1:
Replace "activate" with "make (the facility) operational)"
Section B.4, fifth and ninth bullets;
Replace "activated" with "operational"

3) LO-WTHQN-2011-01386, CA-07 provides corporate direction to "Review site emergency plans to insure compliance with the acceptance of use of KI and the attached basis document. Change plans and procedures to adopt KI basis and procedure." The intent of this CA is to align with a Fleet KI Basis document and draft EN-EP document, "Use of KI for the Emergency Response Organization" which establishes considerations with regard to storage, inventory and distribution of potassium iodide (KI).

KI is currently maintained at the site for use by the ERO as authorized by the Emergency Director and Emergency Plant Manager in adequate quantities to support extended ERO activities for use by the Control Room, TSC, OSC and EOF personnel. The impact to the PNPS Emergency Plan is limited to direction provided within the corporate documents to make KI available at Emergency Response Facilities (ERFs) located beyond the Owner-Controlled Area (OCA) within 10 miles of the plant. This results in the expansion of the use and availability of KI to the Joint Information Center (JIC) and the Chiltonville staging area, which although not a designated ERF, could stage station ERO personnel in a security based event as an intermittent location prior to arrival at the site. The availability of KI in these locations will formalize the consideration of KI in these satellite ERFs and assist in the timely administration of KI to ERO members assigned to these locations in the event KI is authorized by the Emergency Director and/or Emergency Plant Manager. The expansion in the administration of KI to these additional locations is a demonstration of ALARA principles and conservative response preparedness.
This change includes revision to:
Sections H-9, third paragraph:
Revise to read: "Sufficient potassium iodide is available for use by Control Room, TSC, and OSC, JIC and EOF personnel, and is also stored at the Chiltonville staging area."

4) Administrative changes were made to Appendix 1 of the PNPS EPlan to add Reference 1 to this document, 76FR72560, "Enhancements to Emergency Preparedness Regulations,"

Federal Register, Volume 76, p. 72560, Washing, DC, November 23, 2011 and Reference 2 to this document, Regulatory Guide 1.219, Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors, November, 2011, to the Reference listing within the PNPS EPlan. Addition of these documents to the Reference Listing updates the listing to ensure consideration of these important documents in the development of PNPS EPlan revisions.
This change includes revision to:
Appendix 1: References.

6. Review the planning standards contained in 10CFR50.47 (b) and 10CFR50, Appendix E to determine if the proposed change affects the ability to meet a standard. Check YES or NO.

Planning Standard Determination

10CFR50.47(b) STANDARDS

☐ YES ☒ NO	1. Assignment of ERO Responsibilities by Licensee, State & county/parish/township.
☐ YES ☒ NO	2. Adequate staffing and response, both Onsite and Offsite.
☐ YES ☒NO	3. Arrangements for assistance, and arrangements for Federal, State and Local staff provided for the EOF.
☐YES ☒NO	4. Emergency Classification/Action Levels and minimum initial offsite response measures.
☐ YES ☒ NO	5. Notification to state/local/ERO, and Notification to the public.
☐ YES ☒ NO	6. Communications – State/Local/ERO and the public.
☐ YES ☒NO	7. Information to the public/media on a periodic basis.
☐ YES ☒NO	8. Emergency facilities and equipment are provided and maintained.
☐ YES ☒NO	9. Methods/systems/equipment for monitoring for offsite radiological consequences.
☐ YES ☒ NO	10. Protective actions for the plume exposure pathway/EPZ for workers and public.
☐ YES ☒NO	11. Emergency Worker exposure control.
☐ YES ☒NO	12. Medical Services for contaminated injured personnel.
☐ YES ☒NO	13. General Plans for reentry and recovery.
☐ YES ☒NO	14. Periodic exercises and drills. Deficiencies are resolved.
☐ YES ☒NO	15. Radiological emergency response training provided.
☐ YES ☒ NO	16. Responsibilities for Emergency Plan development/review/distribution.

10CFR50, APPENDIX E STANDARDS

☐ YES ☒NO	(I), (II), (III) Emergency Plan as described in the FSAR.
☐ YES ☒NO	(IV)A Emergency Organization for coping with radiological emergencies.
☐ YES ☒NO	(IV)B Assessing the release of radiological material and associated EALs.
☐YES ☒NO	(IV)C Emergency classification and EALs and notification/activation of the ERO.
☐ YES ☒ NO	(IV)D Notification of NRC, State, locals and public. Dissemination of information.
☐ YES ☒NO	(IV)E Emergency facilities/equipment with communications systems and medical arrangements.
☐ YES ☒NO	(IV)F Training on and exercising the Emergency Plan.
☐ YES ☒ NO	(IV)G Plan/Procedure maintenance, and surveillance of equipment and supplies.
☐ YES ☒NO	(IV)H Reentry and recovery following an accident.
☐ YES ☒NO	(V) Changes to the Emergency Plan and procedures are sent to the NRC.
☐ YES ☒ NO	(VI) Maintain the Emergency Response Data System (ERDS).

OTHER

☐ YES ☒NO	1. The means or time of evacuating the Protected Area or the EP Owner Controlled Area.
☐ YES ☒NO	2. Public use of the station's Owner Controlled Area.
☐ YES ☒ NO	3. Emergency information provided to the public in terms of method or content.

If any YES is checked, the change must receive prior approval from the NRC.
If NO is checked, the change must be evaluated to determine if the change is a Decrease in Effectiveness.

Decrease in Effectiveness Determination:

☐ YES ☒ NO	1. Has the capability to perform the function(s) been degraded or lost as a result of the change? BASIS: One significant change included within this revision are as a result of NRC Regulatory changes resulting in the publishing of 76FR72560, "Enhancements to Emergency Preparedness Regulations," Federal Register, Volume 76, p. 72560, Washing, DC, on November 23, 2011 and the impact of the this regulation change for PNPS was the requirement to revise the term "decrease in effectiveness" to "reduction in effectiveness". The due date to conform to this new regulatory change (amended emergency change process) under 10 CFR 50.54(q) is February 21, 2012. This change conforms to regulatory changes required under this NRC rule change, but the impact to PNPS EPlan was limited to the above change in term. Changes due to corporate direction to standardize fleet terminology regarding ERF operational status is verbiage change only, and acts to clarify the use of both terms "activate" and "operational". Although the Emergency Director has existing and non-delegable responsibility for authorizing KI to PNPS offsite emergency workers, expanding the formal availability of KI to the JIC and Chiltonville Staging Area provides greater accessibility to the thyroid blocking agent to these ERO members. Editorial changes to add NRC regulatory documents to the Reference listing are administrative in nature. All of these revisions result in no degradation or loss in function as a result of the changes.
☐ YES ☒ NO	2. Have the time requirements of all affected EP requirements been relaxed or lost as a result of the change? BASIS: Reorganizing the availability of KI to the JIC and Chiltonville Staging Area results in a potential decrease in the time needed to make this drug available to PNPS ERO members assigned to these facilities, thereby enhancing the current distribution policies of KI. There are no other time requirements affected by this change.

If either YES is checked, the change must receive prior approval from the NRC.
If NO is checked, the change may be implemented under 50.54(q). Provide basis for determination.

7. STATEMENT OF CONCLUSION

The Proposed Change:

(A) ☒ Continues ☐ Does not continue to meet the standards of 50.47(b) and 10CFR50 Appendix E.

(B) ☐ Does ☒ Does not decrease the effectiveness of the E-plan.

(C) ☐ Requires ☒ Does not require NRC Approval.

8. APPROVAL

Prepared by: _____ (Signature) Date: 2/2/12

Reviewed by: _____ (Signature) Date: 2/13/12