INDIANA & MICHIGAN
ELECTRIC COMPANY
DONALD C. COOK NUCLEAR PLANT

PROCEDURE COVER SHEET

Procedure No. PMP 2081 EPP.013
Revision No. 1

TITLE ENVIRONMENTAL MONITORING AND ANALYSIS

SCOPE OF REVISION

Revision 1 - Complete rewrite.

SIGNATURES

	ORIGINAL	Rev. 1	REV. 2	Rev. 3
PREPARED BY	Dave Weber	M. Glissman		
QUALITY ASSURANCE REVIEW				
INTERFACINC DEPARTMENT HEAD CONCURRENCE	N.A.	Richard Bogan		
DEPARTMENT HEAD APPROVAL	N.A.	NA		
PLANT NUCLEAR SAFETY COMMITTEE	R S Keith	A. Allen Blind		
PLANT MANAGER APPROVAL				
DATE OF ISSUE	3-31-81	8-2-83		

Form No. PMI 2010-1 - REV. 2

LIST OF EFFECTIVE PAGES

PAGE NUMBER	REVISION NUMBER AND DATE
Page 1 of 8	Revision 1 - 8-2-83
Page 2 of 8	Revision 1 - 8-2-83
Page 3 of 8	Revision 1 - 8-2-83
Page 4 of 8 EXHIBIT A	Revision 1 - 8-2-83
Page 5 of 8 EXHIBIT B	Revision 1 - 8-2-83
Page 6 of 8 EXHIBIT C	Revision 1 - 8-2-83
Page 7 of 8 EXHIBIT C	Revision 1 - 8-2-83
Page 8 of 8 EXHIBIT C	Revision 1 - 8-2-83

INDIANA & MICHIGAN ELECTRIC COMPANY
DONALD C. COOK NUCLEAR PLANT

ENVIRONMENTAL MONITORING AND ANALYSIS

1.0 OBJECTIVES

This procedure includes all environmental monitoring at and beyond the Protected Area fence. It may be implemented in parallel with PMP 2081 EPP.012, Off-Site Radiological Monitoring, where indicated. Where manpower resources are limited, implementation of this procedure (or portions thereof) may be deferred or deleted.

NOTE: Monitoring priorities are higher in the short term on or near the Plant site. Because of manpower limitations and the availability of the AEPSC Computer Program CPM002, MIDAS or the TI-59 calculator programs, both whole body and thyroid dose may be initially computed and projected to a radius of ten miles. References: PMP 2081 EPP.004, Protective Action Guides; Radiological Effluent Technical Specifications, 3/4.12.1; Off-Site Dose Calculation Manual, PMP 6010 OSD.001.

2.0 RESPONSIBILITIES

The Radiation Monitoring Teams are responsible to the Radiological Protection Director for conducting environmental surveys and for collection of environmental samples in the event of an accidental release of radioactive material from the Plant. The surveying and sampling shall be greater in extent and frequency than during routine operations.

The Radiation Assessment Director (RAD) supported by the Plant Evaluation Team in the TSC or the R.P Manager/Radiation Control and Waste Handling Manager in the EOF, shall coordinate the analysis of data.

3.0 INSTRUCTIONS

3.1 Expanded Environmental Monitoring and Sampling

Radiation Monitoring Team shall, as directed by the Radiological Protection Director (RPD):

3.1.1 Remove, replace and supplement existing environmental TLD's (per 12 THP 6010.RAD.003) as directed by the RPD.

NOTE: Refer to Exhibits A and B for maps of some existing sampling stations.

3.1.2 As soon as practicable, and thereafter as directed by the RPD, remove and change all routine air particulate and charcoal filters and all routine TLD's.

NOTE: Locations of these sample filters and TLD's are included in 12 THP 6010.RAD.001. Refer to Exhibit C, DCCNP Environmental Monitoring Program, for existing program data.

CAUTION: In collection of any environmental samples, take care to prevent cross-contamination of samples.

3.1.3 Where releases of materials other than noble gas are known or are believed to have occurred, collection of vegetation, milk or other substances may be appropriate. Any sampling of such media shall be coordinated with, or may be under the general direction of, responsible State Officials at the State Emergency Operations Center.

NOTE: Refer to Exhibit C, DCCNP Environmental Monitoring Program, for existing program data.

3.1.4 In the event of liquid releases to the discharge pipe, collect samples as per routine environmental sampling procedures, but with frequencies as directed by the RPD.

NOTE: Unless otherwise specified by the RPD, collect samples in accordance with existing Plant procedures.

3.2 Plume Tracking by Direct Reading

As personnel availability and allotted time permits, monitoring teams may perform plume tracking as per PMP 2081 EPP.012, OFF-Site Radiological Monitoring.

3.3 Calculation of Ingestion Dose

If it becomes necessary for ingestion doses to be calculated, either of the following computer programs may be implemented: AEPSC's computer program, SETPT3; MIDAS program QUICKG.

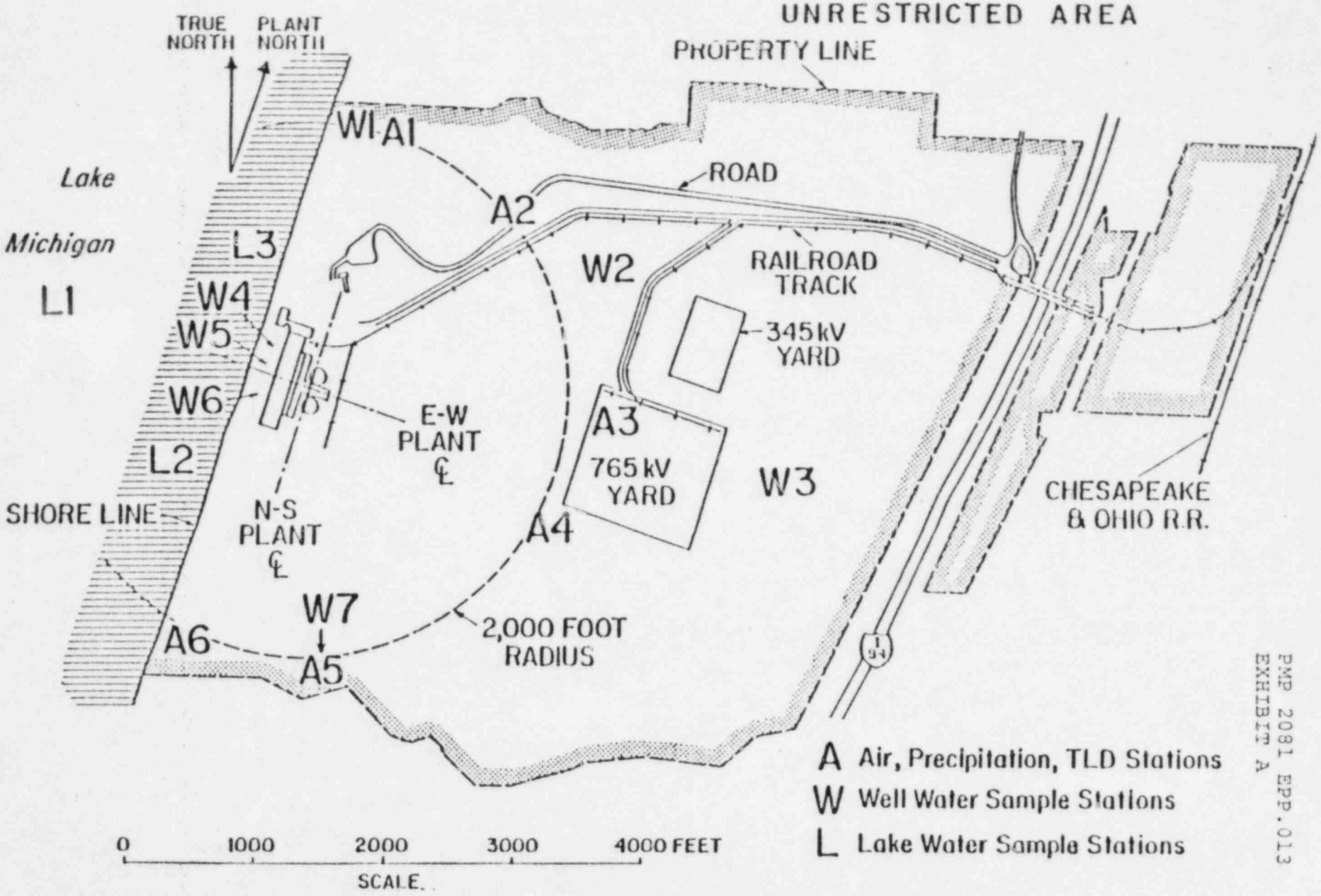

EXHIBIT A

ON-SITE ENVIRONMENTAL SAMPLING STATIONS

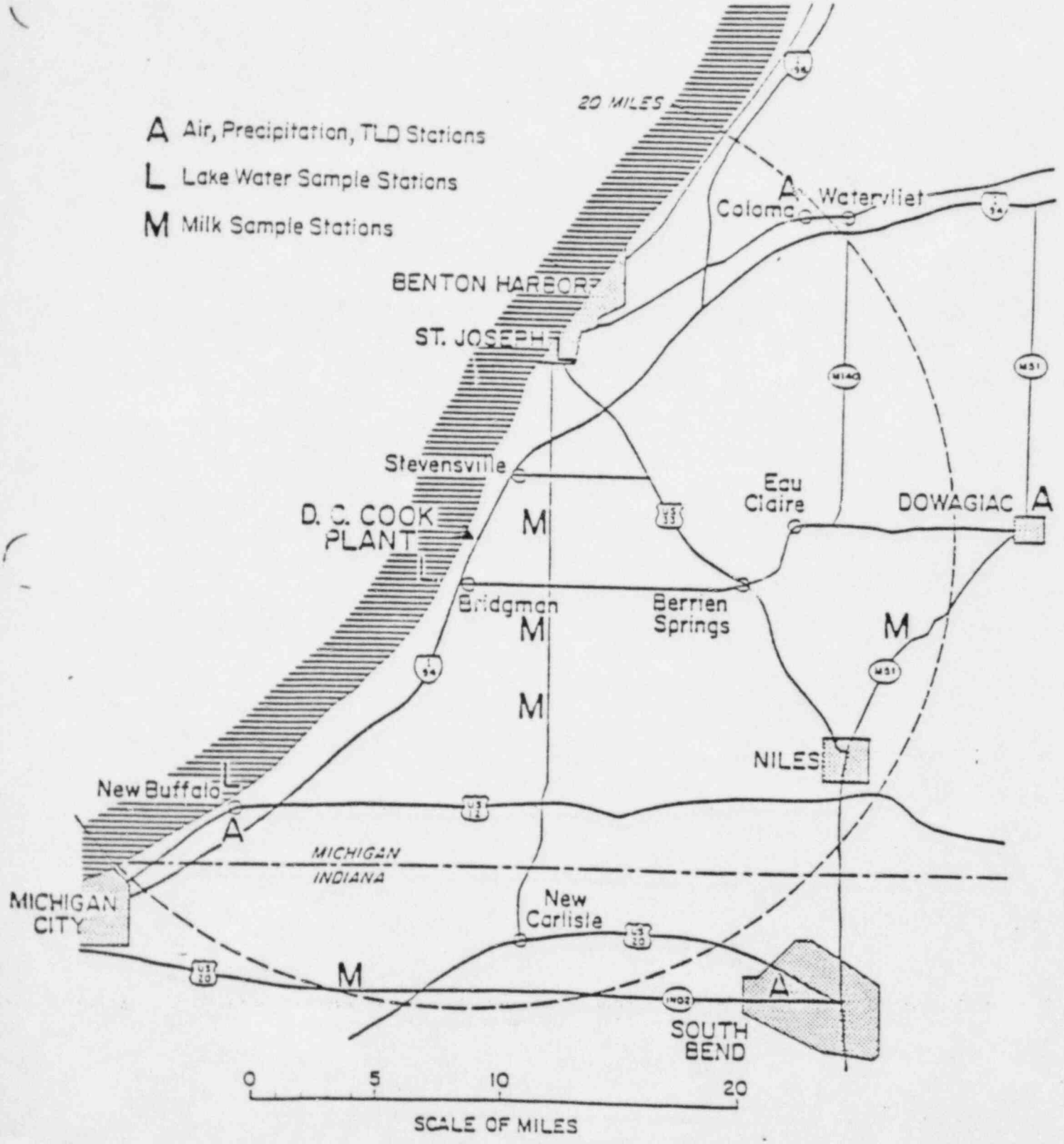

EXHIBIT B

OFF-SITE ENVIRONMENTAL SAMPLING STATIONS

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLES	SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS	REMARKS/REFERENCES
1. Airborne a. Radioiodine and Particulates	A1-A6 (site) New Buffalo, South Bend, Dowagiac and Coloma are background.	Continuous operation of sampler with sample collection as required by dust loading, but at least once per 7 days.	Radioiodine canister analyze weekly for I-131. Particulate Sampler: Gross beta radioactivity following filter change[1]; composite (by location) for gamma isotopic quarterly.	12 THP 6010.RAD.001 12 THP 6010.RAD.001
2. Direct Radiation	a. T1-T9 (Site) b. New Buffalo, South Bend, Dowagiac, Coloma c. 10 TLD monitor locations in the five mile radius.	At least once per 92 days.	Gamma dose; at least once per 92 days.	12 THP 6010.RAD.001 12 THP 6010.RAD.003

[1]Particulate sampie filters should be analyzed for gross beta 24 hours or more after sampling to allow for radon and thoron daughter decay. If gross beta activity in air or water is greater than 10 times the yearly mean of control samples for any medium, gamma isotopic analysis should be performed on the individual samples.

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLES	SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS	REMARKS/REFERENCES
3. Waterborne				
a. Surface	L1, L2, L3	Composite* sample over one month period.	Gamma isotopic; analysis monthly. Composite* for tritium analysis quarterly.	12 THP 6010.RAD.005
b. Ground	W1-W7	Quarterly	Gamma isotopic and tritium analysis quarterly.	12 THP 6010.RAD.004
c. Drinking	St. Joseph, Lake Township, New Buffalo	Composite* sample collected over a period of ≤31 days; Composite* sample over a 2-week period, if I-131 analysis is performed.	Gross beta and gamma isotopic analysis of each composite sample. Tritium analysis of composite quarterly. I-131 analysis on each composite when the dose calculated for the consumption of the water is >1 mRem/year.	12 THP 6010.RAD.004
d. Sediment from Shoreline	L2, L3	Twice/year	Gamma isotopic analyses semi-annually.	12 THP 6010.RAD.007

*Composite samples shall be collected by collecting an aliquot at intervals not exceeding 24 hours.

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLES	SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS	REMARKS/REFERENCES
4. Ingestion				
a. Milk	Stevensville, Bridgman, Galien, Dowagiac, South Bend	At least once per 15 days when animals are on pasture. At least once per 31 days other times.	Gamma isotopic and I-131 analysis of each sample.	12 THP 6010.RAD.006
b. Fish	Plant Site Off Site	Twice/year	Gamma isotopic analysis on edible portion.	12 THP 6010.RAD.008
c. Food Products	Plant Site Off Site (~20 miles)	At time of harvest, one sample of each of the following classes of food products: 1. Grapes	Gamma isotopic analysis on edible portion.	12 THP 6010.RAD.010
	Plant Site	At time of harvest, one sample of broad leaf vegetation.	Gamma isotopic analysis.	12 THP 6010.RAD.010

INDIANA & MICHIGAN POWER COMPANY
DONALD C. COOK NUCLEAR PLANT

PLANT MANAGER PROCEDURE

Index

Identification Number	Title	Revision No. And Date	Comments
PMP 2081 EPP.001	Emergency Telephone Communications	Rev. 1 6-24-82	
EPP.002	Barring of the PABX	Revision 1 6-29-82	
EPP.003	Follow-Up Off-Site Communications	Revision 1 11-16-82	
EPP.004	Protective Action Guides (PAGs) and Protective Actions	Revision 1 9-28-82	TP-1,5-24-83 Exp NA
EPP.005	Personnel Evacuation	Revision 1 5-25-82	
EPP.006	Activation of the Reentry and Rescue Team	Revision 1 9-28-82	
EPP.007	Security Actions During Emergency Conditions	Revision 1 5-5-82	
EPP.008	Emergency Medical Plan Guidelines	Revision 1 9-28-82	TP-1,11-30-82 Exp NA
EPP.009	Health Physics Procedures	Revision 1 9-29-82	
EPP.010	Activation of Radiation Monitoring Teams	Revision 1 2-1-83	
EPP.011	On-Site Radiological Monitoring	Revision 0 4-1-81	
EPP.012	Off-Site Radiological Monitoring	Revision 1 9-8-82	TP-1,1-25-83 Exp NA
EPP.013	Environmental Monitoring and Analysis	Revision 1 8-2-83	

INDIANA & MICHIGAN
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Instruction or Procedure Temporary Sheet

This temporary sheet applies to OFF-SITE DOSE ASSESSMENTS
Instruction or Procedure No. PMP 2081 EPP.014
Revision No. 1

TEMPORARY SHEET NO. TP-3

P. 1 of 1

The following change (X) new requirement ( ) shall be instituted effective (Date) July 26, 1983.

REPLACE the following pages as indicated:

List of Effective Pages, Page 2 of 2, Revision 1, TP-1 with Revision 1, TP-3

EXHIBIT T, Page 1 of 1, Revision 1 with Revision 1, TP-3

REASON FOR CHANGE: To meet new FDA recommendations for use of KI as a thyroid blocking agent in the event of a radiological emergency.

THIS TP REPLACES TP-2 DATED 17 MAY, 1983 WHICH SHOULD HAVE BEEN ISSUED AS TP-3.

This change should be made a permanent revision to the Instruction or Procedure:

☒ YES ☐ NO ☐ NOT KNOWN, additional review required

Expiration Date: PROCEDURE REVISION
Originator: Mary A. Glissman
Management Staff: William Rutkowski
Senior Reactor Operator: [illegible]
PNSRC [illegible] Date 8/2/83
Plant Manager [illegible] Date 8/2/83

Standard Dist. List No.: _____
Distribution: _____

Form No. 4330 REVISED 7/78

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FORM NO. PMI 2010-4 REV. 2

LIST OF EFFECTIVE PAGES

Page Number	Revision Number and Date
EXHIBIT S, Page 1 of 1	Revision 1 - Oct.12, 1982
EXHIBIT T, Page 1 of 1	Revision 1 - TP-3, 8-2-83
EXHIBIT U, Page 1 of 1	Revision 1 - Oct.12, 1982
EXHIBIT V, Page 1 of 1	Revision 1 - Oct.12, 1982
EXHIBIT W, Page 1 of 1	Revision 1 - Oct.12, 1982
EXHIBIT X, Page 1 of 1	Revision 1 - TP-1
EXHIBIT Y, Page 1 of 1	Revision 1 - TP-1

RECOMMENDED PROTECTIVE ACTIONS FOR POPULATION AND WORKERS

Projected Dose (Rem)		Recommended Action(s)[a]	Comments
To the Population			
Whole Body Thyroid	less than 1.0 less than 5.0	No planned protective action[b]. State may issue an advisory to seek shelter and wait further instructions. Monitor environmental radiation levels.	Previously recommended protective actions may be reconsidered or terminated.
Whole Body Thyroid	1.0 to less than 5.0 5.0 to less than 25.0	Seek shelter as a minimum. Consider evacuation. Evacuate unless constraints make it impractical. Monitor environmental radiation levels. Control access.	If constraints, exist, special consideration should be given for evaculation of children and pregnant women.
Whole Body Thyroid	5 and above 25 and above	Conduct mandatory evacuation. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these.	Seeking shelter would be an alternative if evacuation were not immediately possible.
To Emergency Workers			
Whole Body Thyroid	25 125	Control exposure of emergency team members to these levels except for lifesaving missions. (Appropriate controls for emergency workers include time limitations, respirators, and stable iodine. Administer KI tablets if thyroid dose is projected to be ≥ 25 R.)	Although respirators and stable iodine should be used where effective to control dose to emergency team workers, thyroid dose may not be a limiting factor for livesaving missions[c].
Whole Body	75	Control exposure of emergency personnel performing lifesaving missions to this level. (Control of time of exposure will be most effective.)	

[a] These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration.

[b] At the time of the incident, officials may implement low-impact protective actions in keeping with the principle of maintaining radiation exposures as low as reasonably achievable.

[c] If one or more lives is likely to be saved, no upper limit for thyroid dose is established.

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DONALD C. COOK NUCLEAR PLANT

PLANT MANAGER PROCEDURE

Index

Identification Number	Title	Revision No. And Date	Comments
PMP 2081 EPP.014	Off-Site Dose Assessments	Revision 1 10-12-82	TP-1,1-25-83 Exp. NA TP-2,2-22-83 Exp NA TP-3,8-2 -83 Exp NA
EPP.015	Sampling and Analysis of Waterborne Releases	Revision 0 4-1-81	
EPP.016	Collection and Analysis of Liquid and Gaseous Samples	Revision 0 4-1-81	
EPP.017	Interpretation of Liquid and Gaseous Samples	Revision 0 4-1-81	
EPP.018	Transportation Accidents Involving Radioactive Material	Revision 1 6-24-82	
EPP.019	AEP Emergency Response Organization Activation and Management	Revision 0 4-1-81	
EPP.020	Activation and Operation of the Technical Support Center (TSC)	Revision 1 8-24-82	TP-1,9-9-82 Exp NA
EPP.021	Activation and Operation of the Operations Staging Area (OSA) and Personnel Accountability	Revision 1 5-25-82	
EPP.022	Activation and Operation of the Emergency Operations Facility	Revision 3 1-28-83	TP-1, 7-27-83 Exp NA
EPP.023	Activation and Operation of the Emergency Control Center (ECC) (An Emergency Operations Facility)	CANCELLED 6-4-82	
EPP.024	Activation and Operation of the Joint Public Information Center (JPIC) (An Emergency Operations Facility)	Revision 1 6-24-82	