Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

October 20, 2003

10 CFR 50,
Appendix E
Section V

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos.	50-259	50-390
Tennessee Valley Authority	)		50-260	50-391
			50-296	50-327
				50-328

TVA CENTRAL EMERGENCY CONTROL CENTER (CECC) - EMERGENCY PLAN IMPLEMENTING PROCEDURE (EPIP) REVISIONS

In accordance with the requirements of 10 CFR Part 50, Appendix E, Section V, enclosed are copies of the Effective Page Listing and revisions to CECC EPIPs.

PROCEDURE		EFFECTIVE DATE
EPIP	EPL	10/9/03
EPIP-6	Rev. 25	10/9/03
EPIP-7	Rev. 29	10/9/03
EPIP-8	Rev. 27	10/9/03
EPIP-23	Rev. 19	10/9/03

If you have any questions, please contact Terry Knuettel at (423) 751-6673.

Sincerely,

Mark J. Burzynski

Mark J. Burzynski
Manager
Nuclear Licensing

Enclosures
cc: See page 2

A045

cc (Enclosures):
U.S. Nuclear Regulatory Commission (Enclosures 2)
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-8931

NRC Senior Resident Inspector [Enclosures provided
Browns Ferry Nuclear Plant by site DCRM]
10833 Shaw Road
Athens, Alabama 35611-6970

NRC Senior Resident Inspector [Enclosures provided
Sequoyah Nuclear Plant by site DCRM]
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379-3624

NRC Senior Resident Inspector [No enclosures, by request
Watts Bar Nuclear Plant of site resident]
1260 Nuclear Plant Road
Spring City, Tennessee 37381

DOCUMENT RELEASE AND FILING INSTRUCTIONS

Page 1 of 1
Release No.

To: Management Services/RIM/EDM
Other
Address:
Date Submitted to Management Services/RIM/EDM:
Date to Filed By:

Prepared By: Gail White
Extension: 751-2108
Organization: AS&P
Address: LP 4D-C

Attached are: *(select one)*
☒ QA Records/Documents
☐ Non-QA Records/Documents

Release and Submitted for:
☒ Distribution
☒ Retention

DOCUMENT NUMBER	REV	NO. PAGES	REC ACCPT Y	REC ACCPT N	DATE	REMOVE PAGES	INSERT PAGES
CECC-EPIP							
List of Effective Pages		9	✓		10/09/03	1 – 9	1 - 9
CECC EPIP-6, cover sheet	25	1	✓		10-9-03	cover sheet	cover sheet
CECC EPIP-6, rev. log	25	2 ✓	✓			rev. log	rev. log
CECC EPIP-6	25	23	✓			All	1 - 23
CECC EPIP-7, cover sheet	29	1	✓		10-9-03	cover sheet	cover sheet
CECC EPIP-7, rev. log	29	2 ✓	✓			rev. log	rev. log
CECC EPIP-7	29	15	✓			All	1 - 15
CECC EPIP-8, cover sheet	27	1	✓		10-9-03	cover sheet	cover sheet
CECC EPIP-8, rev. log	27	2 ✓	✓			rev. log	rev. log
CECC EPIP-8	27	32	✓			All	1 - 32
CECC EPIP-23, cover sheet	19	1	✓		10-9-03	cover sheet	cover sheet
CECC EPIP-23, rev. log	19	2 ✓	✓			rev. log	rev. log
CECC EPIP-23	19	24	✓			All	1 - 24

Date

Contact: Ext.

Acceptance:
Lana L. Farmer 10-9-03
Signature Date

TENNESSEE VALLEY AUTHORITY
CENTRAL EMERGENCY CONTROL CENTER EMERGENCY PLAN
IMPLEMENTING PROCEDURES
LIST OF EFFECTIVE PAGES

This list of effective pages must be retained with the CECC-EPIPs.

Procedure No.	Subdivision	Page No.	Rev. No.
	List of Effective Pages	1 of 9	10/09/03
		2 of 9	10/09/03
		3 of 9	10/09/03
		4 of 9	10/09/03
		5 of 9	10/09/03
		6 of 9	10/09/03
		7 of 9	10/09/03
		8 of 9	10/09/03
		9 of 9	10/09/03
Table of Contents		1 of 2	10/17/02
		2 of 2	10/17/02
EPIP-1		Cover Sheet	37
		Rev. Log	37
		1 of 33	37
		2 of 33	37
		3 of 33	37
		4 of 33	37
		5 of 33	37
	Appendix A	6 of 33	37
	Appendix B	7 of 33	37
		8 of 33	37
	Appendix C	9 of 33	37
	Appendix D	10 of 33	37
	Appendix E	11 of 33	37
	Appendix F	12 of 33	37
	Appendix G	13 of 33	37
		14 of 33	37
	Appendix H	15 of 33	37
	Appendix I	16 of 33	37
		17 of 33	37
		18 of 33	37
		19 of 33	37
	Appendix J	20 of 33	37
		21 of 33	37
		22 of 33	37
		23 of 33	37
	Appendix K	24 of 33	37
		25 of 33	37
		26 of 33	37
	Appendix L	27 of 33	37
	Appendix M	28 of 33	37
	Appendix N	29 of 33	37
		30 of 33	37

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-1 (Continued)		31 of 33	37
		32 of 33	37
		33 of 33	37
EPIP-2		Cover Sheet	30
		Rev. Log	30
		1 of 5	30
		2 of 5	30
		3 of 5	30
	Appendix A	4 of 5	30
	Appendix B	5 of 5	30
EPIP-3		Cover Sheet	31
		Rev. Log	31
		1 of 8	31
		2 of 8	31
		3 of 8	31
		4 of 8	31
		5 of 8	31
	Appendix A	6 of 8	31
	Appendix B	7 of 8	31
	Appendix C	8 of 8	31
EPIP-4		Cover Sheet	32
		Rev. Log	32
		1 of 8	32
		2 of 8	32
		3 of 8	32
		4 of 8	32
		5 of 8	32
	Appendix A	6 of 8	32
	Appendix B	7 of 8	32
	Appendix C	8 of 8	32
EPIP-5		Cover Sheet	34
		Rev. Log	34
		1 of 10	34
		2 of 10	34
		3 of 10	34
		4 of 10	34
		5 of 10	34
	Appendix A	6 of 10	34
		7 of 10	34
		8 of 10	34
	Appendix B	9 of 10	34
	Appendix C	10 of 10	34
EPIP-6		Cover Sheet	25
		Rev. Log	25
		1 of 23	25
		2 of 23	25
		3 of 23	25
		4 of 23	25

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-6 (Continued)	Appendix A	5 of 23	25
		6 of 23	25
		7 of 23	25
	Appendix B	8 of 23	25
	Appendix C	9 of 23	25
	Appendix D	10 of 23	25
		11 of 23	25
	Appendix E	12 of 23	25
		13 of 23	25
		14 of 23	25
	Appendix F	15 of 23	25
	Appendix G	16 of 23	25
		17 of 23	25
	Appendix H	18 of 23	25
		19 of 23	25
	Appendix I	20 of 23	25
		21 of 23	25
	Appendix J	22 of 23	25
	Appendix K	23 of 23	25
EPIP-7		Cover Sheet	29
		Rev. Log	29
		1 of 15	29
		2 of 15	29
		3 of 15	29
		4 of 15	29
		5 of 15	29
		6 of 15	29
		7 of 15	29
		8 of 15	29
	Appendix A	9 of 15	29
	Appendix B	10 of 15	29
	Appendix C	11 of 15	29
	Appendix D	12 of 15	29
		13 of 15	29
	Appendix E	14 of 15	29
	Appendix F	15 of 15	29
EPIP-8		Cover Sheet	27
		Rev. Log	27
		1 of 32	27
		2 of 32	27
		3 of 32	27
		4 of 32	27
		5 of 32	27
		6 of 32	27
	Appendix A	7 of 32	27
	Appendix B	8 of 32	27
	Appendix C	9 of 32	27
		10 of 32	27
	Appendix D	11 of 32	27

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-8 (Continued)		12 of 32	27
	Appendix E	13 of 32	27
		14 of 32	27
	Appendix F	15 of 32	27
		16 of 32	27
		17 of 32	27
		18 of 32	27
		19 of 32	27
		20 of 32	27
		21 of 32	27
		22 of 32	27
	Appendix G	23 of 32	27
	Appendix H	24 of 32	27
	Appendix I	25 of 32	27
		26 of 32	27
		27 of 32	27
		28 of 32	27
		29 of 32	27
	Appendix J	30 of 32	27
		31 of 32	27
		32 of 32	27
EPIP-9		Cover Sheet	28
		Rev. Log	28
		1 of 49	28
		2 of 49	28
		3 of 49	28
		4 of 49	28
		5 of 49	28
		6 of 49	28
		7 of 49	28
		8 of 49	28
		9 of 49	28
		10 of 49	28
		11 of 49	28
		12 of 49	28
		13 of 49	28
		14 of 49	28
		15 of 49	28
		16 of 49	28
		17 of 49	28
		18 of 49	28
		19 of 49	28
		20 of 49	28
		21 of 49	28
		22 of 49	28
		23 of 49	28
		24 of 49	28
		25 of 49	28
	Appendix A	26 of 49	28
	Appendix B	27 of 49	28
	Appendix C	28 of 49	28

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-9 (Continued)		29 of 49	28
	Appendix D	30 of 49	28
		31 of 49	28
	Appendix E	32 of 49	28
		33 of 49	28
	Appendix F	34 of 49	28
	Appendix G	35 of 49	28
	Appendix H	36 of 49	28
		37 of 49	28
		38 of 49	28
		39 of 49	28
	Appendix I	40 of 49	28
		41 of 49	28
		42 of 49	28
		43 of 49	28
	Appendix J	44 of 49	28
	Appendix K	45 of 49	28
	Appendix L	46 of 49	28
		47 of 49	28
		48 of 49	28
		49 of 49	28
EPIP-11		Cover Sheet	12
		Rev. Log	12
		1 of 17	12
		2 of 17	12
	Appendix A	3 of 17	12
	Appendix B	4 of 17	12
	Appendix C	5 of 17	12
		6 of 17	12
	Appendix D	7 of 17	12
	Appendix E	8 of 17	12
		9 of 17	12
		10 of 17	12
	Appendix F	11 of 17	12
	Appendix G	12 of 17	12
	Appendix H	13 of 17	12
	Appendix I	14 of 17	12
	Appendix J	15 of 17	12
		16 of 17	12
		17 of 17	12
EPIP-12		Cover Sheet	18
		Rev. Log	18
		1 of 19	18
		2 of 19	18
	Attachment 1	3 of 19	18
	Attachment 2	4 of 19	18
	Attachment 3	5 of 19	18
	Attachment 3	6 of 19	18
	Attachment 3	7 of 19	18
	Attachment 3	8 of 19	18

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-12 (Continued)	Attachment 3	9 of 19	18
	Attachment 4	10 of 19	18
	Attachment 5	11 of 19	18
	Attachment 6	12 of 19	18
	Attachment 7	13 of 19	18
	Attachment 7	14 of 19	18
	Attachment 8	15 of 19	18
	Attachment 9	16 of 19	18
	Attachment 9	17 of 19	18
	Attachment 10	18 of 19	18
	Attachment 10	19 of 19	18
EPIP-13		Cover Sheet	10
		Rev. Log	10
		1 of 15	10
		2 of 15	10
		3 of 15	10
		4 of 15	10
		5 of 15	10
		6 of 15	10
	Appendix A	7 of 15	10
		8 of 15	10
		9 of 15	10
	Appendix B	10 of 15	10
	Appendix C	11 of 15	10
		12 of 15	10
		13 of 15	10
		14 of 15	10
	Appendix D	15 of 15	10
EPIP-14		Cover Sheet	25
		Rev. Log	25
		1 of 21	25
		2 of 21	25
		3 of 21	25
		4 of 21	25
		5 of 21	25
		6 of 21	25
	Appendix A	7 of 21	25
		8 of 21	25
		9 of 21	25
	Appendix B	10 of 21	25
		11 of 21	25
		12 of 21	25
		13 of 21	25
		14 of 21	25
	Appendix C	15 of 21	25
		16 of 21	25
		17 of 21	25
		18 of 21	25
		19 of 21	25

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-14 (Continued)		20 of 21	25
	Appendix D	21 of 21	25
EPIP-15		Cover Sheet	0
		Rev. Log	0
		1 of 5	0
		2 of 5	0
		3 of 5	0
	Appendix A	4 of 5	0
	Appendix B	5 of 5	0
EPIP-17		Cover Sheet	17
		Rev. Log	17
		1 of 27	17
		2 of 27	17
		3 of 27	17
		4 of 27	17
		5 of 27	17
	Appendix A	6 of 27	17
	Appendix B	7 of 27	17
	Appendix C	8 of 27	17
		9 of 27	17
		10 of 27	17
	Appendix D	11 of 27	17
	Appendix E	12 of 27	17
	Appendix F	13 of 27	17
	Appendix G	14 of 27	17
		15 of 27	17
		16 of 27	17
		17 of 27	17
		18 of 27	17
	Appendix H	19 of 27	17
	Appendix I	20 of 27	17
	Appendix J	21 of 27	17
	Appendix K	22 of 27	17
	Appendix L	23 of 27	17
	Appendix M	24 of 27	17
		25 of 27	17
		26 of 27	17
	Appendix N	27 of 27	17
EPIP-18		Cover Sheet	9
		Rev. Log	9
		1 of 6	9
		2 of 6	9
		3 of 6	9
		4 of 6	9
	Appendix A	5 of 6	9
	Appendix B	6 of 6	9

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-19		Cover Sheet	12
		Rev. Log	12
		1 of 11	12
		2 of 11	12
		3 of 11	12
		4 of 11	12
		5 of 11	12
	Appendix A	6 of 11	12
		7 of 11	12
	Appendix B	8 of 11	12
		9 of 11	12
		10 of 11	12
		11 of 11	12
EPIP-21		Cover Sheet	13
		Rev. Log	13
		1 of 4	13
		2 of 4	13
	Appendix A	3 of 4	13
	Appendix B	4 of 4	13
EPIP-22		Cover Sheet	19
		Rev. Log	19
		1 of 7	19
		2 of 7	19
	Attachment A	3 of 7	19
	Attachment B	4 of 7	19
		5 of 7	19
		6 of 7	19
		7 of 7	19
EPIP-23		Cover Sheet	19
		Rev. Log	19
		1 of 24	19
		2 of 24	19
		3 of 24	19
		4 of 24	19
	Attachment A	5 of 24	19
	Attachment B	6 of 24	19
		7 of 24	19
		8 of 24	19
		9 of 24	19
		10 of 24	19
		11 of 24	19
	Attachment C	12 of 24	19
	Attachment D	13 of 24	19
	Attachment E	14 of 24	19
		15 of 24	19
	Attachment F	16 of 24	19
		17 of 24	19
		18 of 24	19

List of Effective Pages (Continued)

Procedure No.	Subdivision	Page No.	Rev. No.
EPIP-23 (Continued)		19 of 24	19
		20 of 24	19
	Attachment G	21 of 24	19
		22 of 24	19
	Attachment H	23 of 24	19
	Attachment I	24 of 24	19

CECC EPIP Coversheet

Tennessee Valley Authority CENTRAL EMERGENCY CONTROL CENTER EMERGENCY PLAN IMPLEMENTING PROCEDURES	Title CECC PLANT ASSESSMENT STAFF PROCEDURE FOR ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY	CECC EPIP-6 REV. 25 Effective Date: 10/09/03

WRITTEN BY: Thomas E. Collins REVIEWED BY: David Pond 10/02/2003
Signature *Signature* *Date*

PLAN EFFECTIVENESS DETERMINATION: Thomas E. Collins 9/10/03
Signature *Date*

CONCURRENCES

Concurrence Signature	Date
☒ Manager, EP Program Planning and Implementation David Pond	10/02/2003
☒ Manager, Emergency Preparedness B K Markes	10/3/03
☒ Manager, Radiological and Chemistry Services Chambers	10/3/03
☐	

APPROVAL

APPROVED BY: James E. Maddox Vice President, E&TS 10/7/03
Signature *Title* *Organization* *Date*

CECC-EPIP-6
CECC PLANT ASSESSMENT STAFF PROCEDURE FOR
ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY
REVISION LOG

Rev. No.	Date	Revised Pages
0	3/22/88	All (Changed from IPD to EPIP)
1	7/8/88	Page 1 of App. E
2	7/13/89	2, 3, App. A, App. F
3	10/26/89	4, App. A (1-2), App. C, App. G-I
4	7/02/90	1-4, App. E (1-6), App. H (pg. 1), App. J (added)
5	9/14/90	App. A, pg. 1; App. C, pg. 2; App. E, Pgs. 1-4; App. G, pg. 2
6	5/21/91	Page 1 of 4, App. C, Pgs. 1 & 2, App. E, Pgs. 1 - 5, App. G, Pg. 2, App. H, Pg. 1
7	5/15/92	App. A, pg. 3, App. G, Pg. 1, and App. I, pg. 1 revised. New coversheet & rev. log added. All pages issued.
8	05/17/93	2-4; App. A, pgs. 1 & 3; App. C, pg. 1; App. D, pg. 1; App. E, pg. 1; new App. G added; App. H, pgs. 1-2; App. I, pg. 1; App. J; and App. K. All pages issued to maintain rev. level.
9	07/19/93	Appendix C, pgs. 1-3; App. E, pgs. 1-3. All pages issued.
10	11/30/93	App. C, pgs. 1-2; all pages issued.
11	04/19/94	Pgs. 1, 2, & 4; App. A; App. C; App. F (deleted) App. G; App. H; App. I; and App. J
12	6/26/95	App. F; all pages issued.
13	11/01/95	Revise PAR Diagram. All pages issued.
14	10/30/96	Remove non-plant assessment staff responsibilities from the procedure, update PAR chart, update references list, remove references to written status updates provided by sites, remove specific numbers of Technical Advisors to be assigned at different centers, remove reference to locked drawing cabinet. Procedure put in new format. All pages issued.
15	4/7/97	Annual review. Editorial changes, revise PAC checklist, revise insurance notification instructions, streamline instructions. All pages issued.
16	3/6/98	Annual review. Pgs. 12-14 revise critical drawing lists. Pg. 16 revise Plant Assessment Manager Checklist. Pg. 22 revise CECC Assessment Team Leader Checklist. All pages issued.
17	7/7/98	Revise critical drawing list (App. E) and Plant Assessment Team Reference Material/Equipment (App. D). All pages issued.

CECC-EPIP-6
CECC PLANT ASSESSMENT STAFF PROCEDURE FOR
ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY
REVISION LOG (Continued)

Rev. No.	Date	Revised Pages
18	10/27/98	Update Plant Assessment Coordinator and Assessment Team Leader checklists. All pages issued.
19	2/22/99	Revise PAR diagram. Annual review. All pages issued.
20	5/1/99	Revise PAR diagram. All pages issued.
21	8/17/00	Annual review. Revise PAR diagram. All pages issued.
22	2/5/01	Correct PAR diagram. All pages issued.
23	3/30/01	Annual review. Provide new PAR diagram. All pages issued.
24	5-30-03	Update RSC instruction for insurance carrier notification.
25	10/09/03	Annual review. Update instructions for information to be provided to the Insurance Carrier. Add clarification for the WBN and SQN PAT Leader for BFN events. All pages issued.

CECC PLANT ASSESSMENT STAFF PROCEDURE FOR ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY

1.0 PURPOSE

This procedure is designed to direct the Plant Assessment Manager and staff to ensure a consistent, accurate, and timely response in the event of an accident. This procedure further serves to identify the necessary information which is provided to the CECC Director to ensure that prompt, accurate, public protective action recommendations can be made by the CECC to appropriate State authorities.

2.0 SCOPE

This procedure covers the actions of the Plant Assessment Manager and staff during an Alert, Site Area Emergency, or General Emergency.

3.0 REFERENCES

Radiological Emergency Plan.

4.0 ABBREVIATIONS AND DEFINITIONS

CECC - Central Emergency Control Center
EDO - Emergency Duty Officer
FSAR - Final Safety Analysis Report
NCO - Nuclear Central Office
NE - Nuclear Engineering
NP - Nuclear Power
ODS - Operations Duty Specialist
SM - Shift Manager
SPDS - Safety Parameter Display System
STC - Sequoyah Training Center
SRO - Senior Reactor Operator
REND - Radiological Emergency Notification Directory
TAT - Technical Assessment Team (onsite)
TSC - Technical Support Center

5.0 RESPONSIBILITIES

5.1 The ODS is responsible for contacting the CECC Plant Assessment staff and having them report to the CECC.

The Plant Assessment Manager is responsible for ensuring that the CECC Director is provided with periodic summaries of information needed for overall accident assessment.

5.2 CECC Plant Assessment Staff

The CECC Plant Assessment staff is responsible for assisting the Plant Assessment Manager in carrying out his responsibilities in providing NCO technical support to the affected plant and to the CECC Director. An assignment of positions and duties of the Plant Assessment staff as well as a description of augmenting support groups is described in appendix A.

5.3 Attachment K or a similar form will be used to document Fitness for Duty when an individual is called and requested to respond to an emergency.

6.0 PROCEDURE REQUIREMENTS

6.1 Initial Actions (Plant Assessment Manager)

6.1.1 Notify the Technical Assessment Manager that the CECC Plant Assessment staff is activated. Obtain a current status report.

6.1.2 Review the emergency condition with the CECC Director.

6.1.3 Ensure that the Plant Assessment Team and Boardwriter have established communication with the site control room communication bridge.

6.1.4 Determine if other technical support personnel are required and, if so, have the ODS notify. (See REND.)

6.2 Accident Assessment

6.2.1 Verify that the ICS is functional.

6.2.2 The Plant Assessment Team shall evaluate site's conditions and develop assessments in terms of current and long-range plant conditions and apply their evaluation to making appropriate public protective action recommendations.

6.2.3 The Plant Assessment Manager shall ensure that accident assessment information is provided to the CECC Director on a frequent basis (at a minimum, hourly). These assessments shall provide summary information (appendix B) as well as appropriate recommended public protective actions in accordance with accident assessment logic specified in Appendix C. The Plant Assessment Manager will ensure the plant information on the status display is correct and current. (See Appendix G for checklist.)

6.2.4 Potential Release Evaluation

If after consultation with the Plant Assessment and Radiological Assessment Managers, the CECC Director requests that a predictive release evaluation be performed based on the potential for significant changes in plant conditions, the Plant Assessment Team shall determine the appropriate assumptions to be made and perform the necessary calculations. The areas to be considered are as follows:

a. Increased fuel failure (changes in primary coolant activity levels).

b. Anticipated changes in primary coolant leakage rates or break sizes.

c. Anticipated changes in containment leakage rates (i.e., changes in containment pressure and/or changes in size of containment ruptures or holes).

6.3 General Operation

6.3.1 During the course of an emergency, should the accident upgrade, or terminate, the Plant Assessment Manager shall notify the CECC Director immediately.

6.3.2 If available personnel and equipment of NP are not enough to cope with the emergency, contact the designated representative of other TVA organizations, as necessary, to supply adequate resources to recover from the accident. Log the organizations called for assistance. A description of services available and emergency contacts are available in the TVA Radiological Emergency Notification Directory (REND).

6.3.3 For a Site Area Emergency or General Emergency, the site should be reminded that additional technical personnel are available from the CECC to assist the technical support staff at the TSC. The Plant Assessment Manager should discuss the need for this upgraded capability with the Technical Assessment Manager. Based upon this discussion, selected technical support personnel may be dispatched by ground or air transportation.

6.3.4 The Plant Assessment Manager will coordinate with the CECC Director the selection of staff to serve as Technical Advisor(s) to the TVA spokesperson at the JIC; the Public Information Manager and the State Communicator in the CECC; and the TVA liaison at the State EOC. This position will be responsible for providing a nontechnical interpretation of the events.

6.3.5 Relief of Duties

Should the accident be expected to last for an extended period, the Plant Assessment Manager originates a schedule for relief. The duties of Plant Assessment Manager should only be passed on to qualified individuals for the Plant Assessment Manager's position. He also directs his staff to prepare a schedule for their relief to ensure that necessary Plant Assessment staff is available for the duration of the emergency.

6.3.6 The Plant Assessment Manager and staff will support the CECC Director as required for carrying out recovery efforts from the accident.

6.3.7 Upon termination of the emergency, the Plant Assessment Manager and staff shall make themselves available for review of the accident.

7.0 Checklist for Positions

Plant Assessment Coordinator - Appendix H

Resource Support Coordinator - Appendix I

Plant Assessment Team Leader - Appendix J

APPENDIX A Page 1 of 3

CECC PLANT ASSESSEMENT STAFF POSITIONS/SUPPORT FUNCTIONS

I. PLANT ASSESSMENT STAFF

A. Plant Assessment Manager - Directs the CECC Plant Assessment staff and advises the CECC Director on protective action recommendations based on plant status. (See CECC-EPIP-1, Appendix A, for specific duties).

B. Plant Assessment Coordinator - Responsible for managing the overall activities of the CECC Plant Assessment Team and keeping the Plant Assessment Manager and CECC Director informed of plant status. (See Appendix H for checklist.)

1. Ensures that overall plant assessments are being periodically provided to the Plant Assessment Manager. This assessment (Appendix B) shall be based on an evaluation of plant conditions and its application to the protective action logic diagram (Appendix C). The Plant Assessment Manager will use the assessments and recommendations to brief the CECC Director.

2. Responsible for coordinating (through the Resource Support Coordination) other support activities as required.

C. Resource Support Coordinator - Coordinates certain staff and logistical support to the CECC. Conveys requests for technical support from NP sources. (See Appendix I for checklist.)

1. Provides logistics support as required to the CECC.

2. Maintains communications with other NP technical staff representatives to keep them briefed on the emergency conditions and coordinates obtaining support from them as necessary.

3. Assists the Plant Assessment Coordinator in other communications needs as necessary.

* 4. The Resource Support Coordinator provides initial notification to the liability insurance carrier (ANI).

*Revision

APPENDIX A Page 2 of 3

D. Plant Assessment Team - Provides periodic evaluation of plant status information and protective action recommendations (when applicable) to the Plant Assessment Manager. Serves as a technical reference. (See Appendix J for checklist.)

The assessment team shall be made up of the following: team leader, engineers, SROs, STAs, core damage assessors, etc. Exact makeup of the team will be determined by the team leader.

Duties

1. The Plant Assessment Team Leader will be activated by the ODS. The Plant Assessment Team Leader is responsible for activating the remainder of the required team members.

2. The assessment team shall provide a periodic evaluation of the situation and input back to the site and the CECC as appropriate via the Plant Assessment Coordinator.

3. The assessment team shall evaluate all current ICS data and previous telecopied information and discuss the key plant events with the Plant Assessment Manager or Plant Assessment Coordinator to ensure they have received all the information necessary to begin an evaluation of plant conditions. Appendix C provides a methodology to be used as guidance in providing a recommended protective action for the public to the CECC Director.

4. The assessment team will draw on their knowledge of SPDS data, FSAR, Emergency Operating Instructions, owners' group work, analytical basis for accident analyses, and communications with the TSC in generating plant assessments (appendix B) in terms of current and long-range plant conditions, and in applying their evaluation to the protective action logic diagram (appendix C). Appendix D provides a list of reference material which is maintained in the Plant Assessment Team area. Appendix E provides a list of the critical drawings which are controlled in the CECC. The overall accident assessment serves to inform the Plant Assessment Manager of the general plant status. It also enables the Plant Assessment Manager to communicate with the CECC Director in planning offsite protective actions with the intent of informing the State through the CECC of the status of the plant and the implications of that status. These assessments shall be updated hourly (minimum).

5. If requested, the assessment team may serve as an engineering/ operations reference for the plant. They will reply to plant inquiries to the best of their ability based on the available information. (See Appendix F for recommendation form). Gross predictive actions may be required for offsite emergency planning. If possible, the change in plant status will be addressed (e.g., the plant's status is improving or the plant's status is degrading).

6. The assessment team, based on the particular accident, will select appropriate safety parameters for trending.

* 7. For BFN events, the duty WBN and SQN PAT Leaders report to the CECC to
* assit the BWR Team Leader/PAC with general duties, such as
* Boardwriter or Communicator. This role does not require detailed knowledge
* of BWR structures, systems, components and procedures.

E. Engineering Coordinator - Coordinates corporate engineering support for the CECC and serves as point of contact for the NE representative in the TSC.

II. SUPPORTING NP STAFFS

Certain organizations may be activated along with the CECC Staff. If requested to staff by the CECC Director, they will report to the assigned location and coordinate support within their areas of expertise.

III. TECHNICAL SUPPORT

Certain NP staffs provide expertise in reactor systems and core engineering, electrical engineering, mechanical engineering, chemical engineering, chemistry, shielding, transient analysis, fire protection, electrical distribution (inplant), security, metallurgy, radwaste, and instrumentation. The Plant Assessment Manager delegates to the Resource Support Coordinator the job of contacting these designated individuals by phone or through their respective organizational contacts as needed. If necessary, technical support personnel may be sent to the plant.

APPENDIX B Page 1 of 1
PLANT SYSTEMS ASSESSMENT

TO: PLANT ASSESSMENT MANAGER

TIME OF ASSESSMENT _____

FROM: PLANT ASSESSMENT TEAM

PAGE: _____

UNIT: _____

PLANT SYSTEMS ASSESSMENT

I. HEAT REMOVAL CAPABILITY
☐ Stable ☐ Improving ☐ Deteriorating
Basis:

II. FUEL INTEGRITY AND Rx STATUS
☐ Stable ☐ Improving ☐ Deteriorating
Basis:

III. RADIOACTIVITY IN CONTAINMENT
☐ Stable ☐ Improving ☐ Deteriorating
Basis:

IV. CONTAINMENT INTEGRITY AND STATUS
☐ Stable ☐ Improving ☐ Deteriorating
Basis:

V. OVERALL ASSESSMENT (Including status of other units)
☐ Stable ☐ Improving ☐ Deteriorating
Basis:

_____ _____
Assessment Team Leader Time

_____ _____
Plant Assessment Coordinator Time

APPENDIX C Page 1 of 1
PROTECTIVE ACTION RECOMMENDATIONS

Note 1: If conditions are unknown utilizing the flowchart, then answer NO.

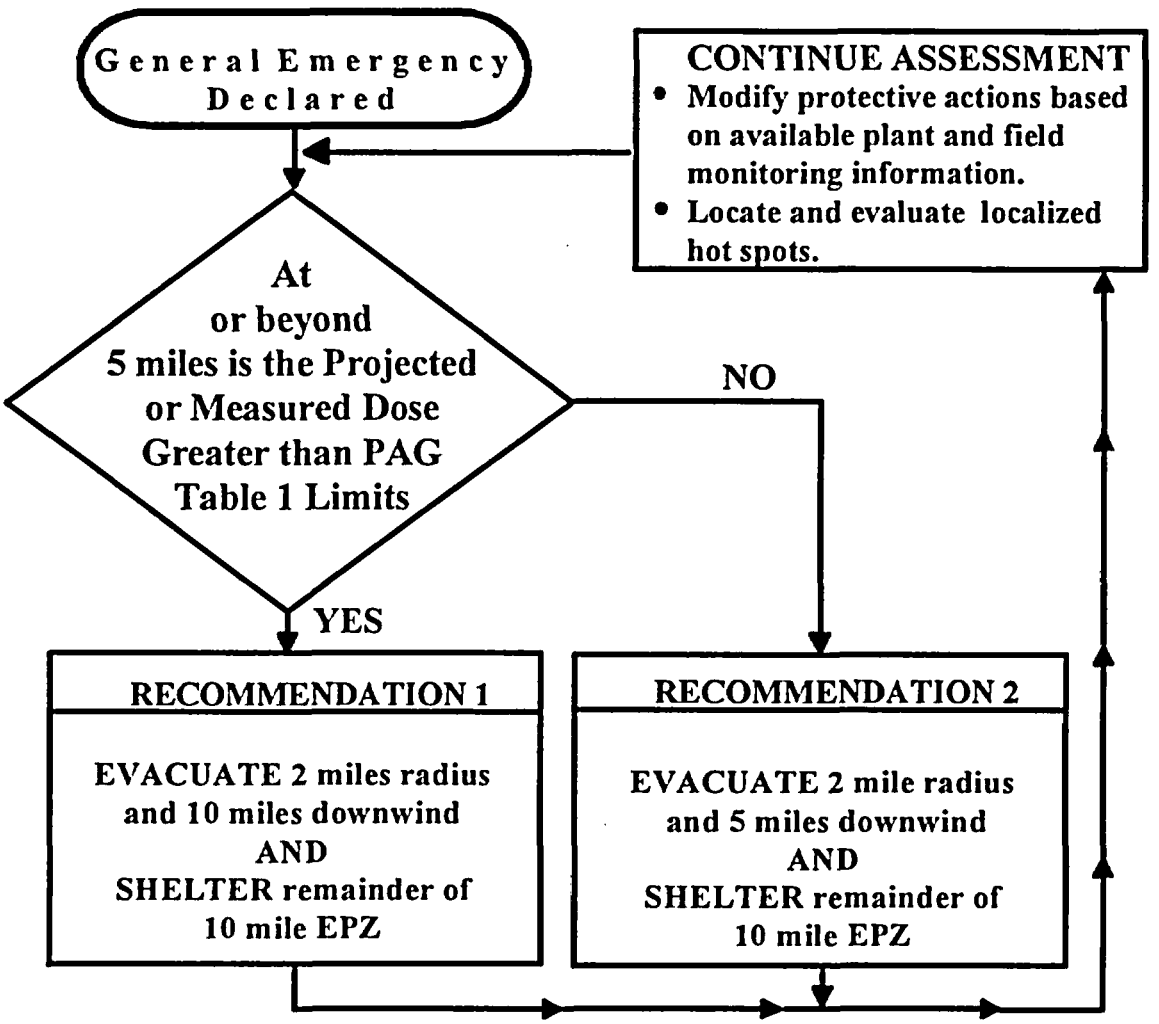


TABLE 1 Protective Action Guides	
TYPE	LIMIT
Measured	3.9E-6 microCi/cc of Iodine 131 or 1 REM/hr External Dose
Projected	1 REM TEDE or 5 REM Thyroid CDE

APPENDIX D Page 1 of 2
PLANT ASSESSMENT TEAM
REFERENCE MATERIAL/EQUIPMENT

Sequoyah

- Final Safety Analysis Report (FSAR)
- Technical Specifications
- Emergency Abnormal Procedures (EAP)
- Emergency Contingency Action (ECA)
- Emergency Plan Implementing Procedures (EPIP)
- Emergency Operating Instructions Program Manual (EPM)
- Emergency Instructions (ES)
- Functional Restoration Guidelines (FR)
- Abnormal Operating Procedures (AOP)
- PWR Systems Manuals (NRC Training Manual)
- Controlled Drawings - Mechanical, Electrical, Logic, Piping Layout
- Offsite Dose Calculation Manual (ODCM)
- Integrated Computer System (ICS)
- Technical Instructions (TI-18 and TI-28)
- Severe Accident Management Guidelines (SAMGs)

Browns Ferry

- Final Safety Analysis Report (FSAR)
- Technical Specifications
- Emergency Plan Implementing Procedures (EPIP)
- Emergency Operating Instructions (EOI, EOI-PM)
- Abnormal Operating Instructions (AOI)
- BWR Systems Manuals (NRC Training Manual)
- Controlled Drawings - Mechanical, Electrical, Logic, Piping Layout
- Technical Instruction - (TI-15 and TI-45)
- Offsite Dose Calculation Manual (ODCM)
- Integrated Computer System (ICS)
- Severe Accident Management Guidelines (SAMGs)

Watts Bar

- Final Safety Analysis Report (FSAR)
- Technical Specifications (Tech Specs)
- Technical Instructions (TI-4 and TI-18)
- Abnormal Operating Instructions (AOI)
- PWR Systems Manuals (NRC Training Manual)
- Offsite Dose Calculation Manual (ODCM)
- Emergency Contingency Actions (ECA)
- Emergency Operating Instructions (EI)
- Emergency Plan Implementing Procedures (EPIP)
- Functional Restoration Guidelines (FR)
- Emergency Response Facility Data System (ERFDS)
- Integrated Computer System (ICS)
- Severe Accident Management Guidelines (SAMGs)

APPENDIX D Page 2 of 2

Corporate

- Radiological Emergency Plan (REP)
- CECC EPIPs
- Radiological Emergency Notification Directory (REND)
- INPO Emergency Resources Manual (ERM)
- Westinghouse Owner's Group Emergency Response Guidelines (WOGERG)

APPENDIX E Page 1 of 3

BROWNS FERRY NUCLEAR PLANT CRITICAL DRAWING LIST

These drawings are maintained in the CECC as critical drawings. Example of numbering system (47W800 = 1-47W800 = 1-47E800). All issued sheets, excluding connectivity (A) and insulation (E) sheets, of a listed drawing will be included unless otherwise noted. Other drawings may be kept in the CECC besides these critical drawings.

15W500
17W200
17W201
45W1504
45W1505
45W1506
45W602-3
47W610 Series
47W611 Series (CCDs only)
47W800 Series

APPENDIX E Page 2 of 3

SEQUOYAH NUCLEAR PLANT CRITICAL DRAWING LIST

These drawings are maintained in the CECC as critical drawings. Example of numbering system (47W800 = 1-47W800 = 1-47E800). All issued sheets, excluding connectivity (A) and insulation (E) sheets, of a listed drawing will be included unless otherwise noted. Other drawings may be kept in the CECC besides these critical drawings.

15E500	47W610-70	47W611-63	47W800	47W856
47W610-1	-72	47W611-99	801	857
-2	-74		802	858
-3	-77		803	859
-5	-78		804	860
-6	-81		805	862
-7	-82		807	865
-12	-85		809	866
-14	-87		810	867
-15	-90		811	868
-18	-92		812	
-20	-94		813	871
-24	-99		814	872
-25			815	881
-26			816	
-27			819	
-28			830	
-30			831	
-31			832	
-31C			834	
-32			835	
-34				
-35			838	
-36			839	
-39			840	
-40			841	
-41			842	
-43			843	
-46			844	
-47			845	
-54			846	
-58			848	
-59			849	
-61			850	
-62			851	
-63			852	
-65			853	
-67			854	
-68			855	

APPENDIX E Page 3 of 3
WATTS BAR NUCLEAR PLANT CRITICAL DRAWING LIST

These drawings are maintained in the CECC as critical drawings. Example of numbering system (47W800 = 1-47W800 = 1-47E800). All issued sheets, excluding connectivity (A) and insulation (E) sheets, of a listed drawing will be included unless otherwise noted. Other drawings may be kept in the CECC besides these critical drawings.

15E500	47W610-70	47W611-00	47W801	47W856
47W610-1	-72	47W611-01	803	857
-2	-74	47W611-03	804	859
-3	-77	47W611-63	805	860
-5	-78	47W611-99	807	862
-6	-81		809	865
-7	-82		810	866
-12	-87		811	868
-14	-90		812	
-15	-94		813	
-18			814	
-20			815	
-24			816	
-26			819	
-27			830	
-28			831	
-30			832	
-32			834	
-35			835	
-36			838	
-39			839	
-40			840	
-41			841	
-43			842	
-46			843	
-47			844	
-54			845	
-58			846	
-59			848	
-61			849	
-62			850	
-63			851	
-65			852	
-67			853	
-68			854	
			855	

APPENDIX F Page 1 of 1

CECC Plant Assessment Team Recommendation to the TSC

Recommendation:

Approval _____
Plant Assessment Coordinator

Approval _____
Plant Assessment Manager

APPENDIX G Page 1 of 2
PLANT ASSESSMENT MANAGER CHECKLIST

Date:_____

TIME/INITIAL

____/____ Designate Systems Technical Advisor to the CECC.

____/____ Designate Systems Technical Advisors to JIC when activated.

____/____ Designate Systems Technical Advisor to State EOC.

____/____ If emergency was declared at BFN, verify that notification of Plant Assessment Staff has been initiated.

____/____ Establish communications with Site Technical Assessment Manager.

____/____ Notify the Site Technical Assessment Manager when the PAT is staffed.

____/____ Prepare shift staffing plan, if necessary. (Direct Plant Assessment Coordinator to prepare plan.)

GENERAL OPERATIONS

1. Log key events and major actions taken.
2. Responsible to the CECC Director to ensure that he is kept periodically briefed on plant status and protective action recommendation assessments.
3. Maintains contact with the site Technical Assessment Manager and ensures that necessary support is provided, makes appropriate recommendations to the Technical Assessment Manager and based on the site's disposition, informs the CECC of the site's actions.
4. Ensures that periodic status reports are received from the site and provided to the CECC Director, other support organizations as needed, and within the CECC.
5. Requests assistance from other organizations, local agencies, government installations, or vendors, as needed.
6. Ensures that a sequence of events is being maintained on the status display.
7. Verify that ICS is functional.

APPENDIX G Page 2 of 2

8. May provide support services to the plant by utilizing all of the necessary manpower and equipment under the control of TVAN. (Direct the Plant Assessment Coordinator to arrange these through the Resource Support Coordinator.)

9. Ensures that employees who may be required to go to the affected plant are fully briefed prior to leaving and know to whom they are to report. Coordinate with the RAM and State Communicator for radiological and travel conditions enroute to the site. (Delegated to the Plant Assessment Coordinator.)

10. Keeps the site emergency organization informed of personnel ordered to the site and expected time of arrival. (May be handled by the Plant Assessment Coordinator and site counterpart or directly through the Technical Assessment Manager.)

APPENDIX H Page 1 of 2

PLANT ASSESSMENT COORDINATOR CHECKLIST

Date:_____

TIME/INITIAL	
____/____	Ensure ICS is functional.
____/____	Verify that the Plant Assessment Team and Board Writer have established communication with the Control Room bridge and is receiving sufficient information.
____/____	Verify that Plant Assessment Team has established communication with the site Technical Assessment Team and that proper coordination is taking place. Ensure that Accident Assessment forms are being generated and provided to Plant Assessment Manager (Appendix B).
____/____	Verify core damage has established communications with Site RadChem. Ensures that Core Damage Team has established communications with the site Technical Assessment Team and is receiving sufficient plant information (primary coolant characteristics, core history and conditions, etc.) to conduct their analyses. Reconciles any discrepancies between Core Damage and Dose Assessment staffs. (Contacts via Rad. Assessment Coordinator or Dose Assessor.)
____/____	Initiate potential release evaluations as requested by Plant and Radiological Assessment Managers.
____/____	Verify that the Resource Support Coordinator has made notifications per his checklist.

APPENDIX H Page 2 of 2

GENERAL OPERATIONS

1. Log key events and major actions taken.

2. Ensures that overall plant assessments are being periodically provided to the Plant Assessment Manager. This assessment shall be based on plant system evaluation (CECC EPIP 6, Appendix B) and its application to the protective action logic diagram (CECC EPIP 6, Appendix C). The Plant Assessment Manager will use the assessments and recommendations to brief the CECC Director.

3. Coordinates (through the Resource Support Coordination) other support activities as required.

4. Notify Plant Assessment Manager immediately of any change in accident classification or significant plant condition developments.

5 Identify, notify, and brief support personnel being dispatched to the site.

6 Prepare long-term staffing plan and schedule when requested by the Plant Assessment Manager.

7. Ensures that the Plant Assessment Team is receiving sufficient plant systems information from their site counterpart.

8. Ensures continual staffing for the plant assessment function.

9. Provides assistance in evaluation of protective action diagram.

APPENDIX I Page 1 of 2
RESOURCES SUPPORT COORDINATOR CHECKLIST

Date:_____

TIME/INITIAL

____/____ Notify NSSS Vendor (REND - Industry Support)

____/____ Notify INPO (REND - Industry Support)

____/____ Notify DOE (REND - Federal Support)

____/____ Notify Insurance Carrier (REND - Insurance Carrier - Liability Insurance, ANI).

* Note: The liability insurance carrier should also be notified of any nuclear plant
* emergency drill or exercise in which the CECC is activated.
*
*
*
*
*
*

____/____ Notify TVA's Nuclear Insurance Support (name and telephone number in REND.

____/____ Upon termination of the REP event, notify those listed above of the termination.

GENERAL OPERATIONS

1. Log key events and major actions taken.

2. Provides logistics support to the CECC as required. Notifies the State Communicator whenever offsite (non-TVA) resources are needed and/or requested.

3. Maintains communications with other TVAN technical staff representatives who have been called on to provide Technical Support to the CECC keep them briefed on the emergency conditions, coordinates obtaining support from them as necessary, and notifies them when the event is terminated.

*Revision

4. Makes certain initial notifications to industry support and insurance carriers (ANI) and updates them routinely on changing plant and offsite radiological conditions.

5. Assists the Plant Assessment Coordinator in other communications needs as necessary.

6. Provides logistics support to the plant for food, transportation and lodging.

APPENDIX J Page 1 of 1
CECC PLANT ASSESSMENT TEAM LEADER OPERATIONAL CHECKLIST

Date: _____

TIME/INITIAL

_____/_____ Ensure full staffing of the CECC Plant Assessment Team: Assessment Team Leader, team members, Plant Systems Boardwriter, and CECC Technical Advisor.

_____/_____ Assemble all available plant data (ODS initial report, site plant parameter data sheets, SPDS outputs, etc.) and provide a briefing to Plant Assessment Coordinator and assessment team members.

_____/_____ Establish contact with the site - Technical Assessment Team's, Reactor Engineer. Avoid contacting the site Technical Assessment Manager directly; his CECC contact is the Plant Assessment Manager.

General Operations

1. Ensure that the Plant Assessment Coordinator and other team members are kept informed of plant conditions and significant changes.
2. Initiate Plant Systems Summary Sheet (Appendix B) at least hourly or upon significant change in conditions.
3. Prepare a Protective Action Recommendation for review by the PAM as requested and for a General Emergency condition.
4. As requested by the site, serve as an engineering/operations reference for the plant.
5. Based on the particular plant conditions, select and trend appropriate safety parameters on the trending boards provided.

APPENDIX K Page 1 of 1

FITNESS FOR DUTY
PROGRAM ADMINISTRATION

TVA NUCLEAR
CALL-IN SHEET

Person Calling: _____ Date: _____

Name	Time Called	Time Needed to Report	Alcohol 5 Hrs. Prior to Report (Y/N)	Fit for Duty (Y/N)	Duty Official Comments

CECC EPIP Coversheet

Tennessee Valley Authority CENTRAL EMERGENCY CONTROL CENTER EMERGENCY PLAN IMPLEMENTING PROCEDURES	Title CECC RADIOLOGICAL ASSESSMENT STAFF PROCEDURE FOR ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY	CECC EPIP-7 REV. 29 Effective Date: 10/09/03

WRITTEN BY: Thomas E. Adkins (Signature) REVIEWED BY: [signature] (Signature) 8/7/2003 (Date)

PLAN EFFECTIVENESS DETERMINATION: Thomas E. Adkins (Signature) 8/7/03 (Date)

CONCURRENCES

Concurrence Signature	Date
☑ Manager, EP Program Planning and Implementation David Pond	8/8/03
☑ Manager, Emergency Preparedness David Pond for BK Marks	8/8/03
☐ Manager, Radiological and Chemistry Services Chandran	10/07/03
☐	

APPROVAL

APPROVED BY: [signature] (Signature) Vice President, E&TS (Title / Organization) 10/7/03 (Date)

CECC-EPIP-7
CECC RADIOLOGICAL ASSESSMENT STAFF
PROCEDURE FOR ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY
REVISION LOG

Rev. No.	Date	Revised Pages
0	3/22/88	All (Changed from IPD to EPIP)
1	7/8/88	Page 1, Apps. F & H
2	11/18/88	1,2,5,6,8, App. E p. 2
3	4/26/89	All
4	9/19/89	All
5	10/26/89	2-3, App. D, App. F
6	7/2/90	2, 4, 6-8, App. A (pg. 1), App. C (1 pg.), App. E (pg. 1), App. J (added)
7	9/14/90	Pg. 6; App. D, Pg. 1
8	5/21/91	Page 7 of 8, App. A, Pg. 1, App. C, Pg. 1, App. D, Pg. 1, App. E, Pg. 2, App. G, Pg. 1, App. I, Pg. 1 (Appendix H deleted)
9	10/17/91	Pg. 7; App. A, pg. 1; App. F, Pg. 1
10	12/23/92	Coversheet and Rev. Log; App. E, pg. 1
11	05/13/93	2, 4-8; App. D, pg. 1; App. E, pg. 1; App. G, pg. 1. All pages issued to maintain rev. level.
12	11/30/93	Page 8; App. A, pgs. 1-2; App. F, pgs. 1 & 2; App. I deleted by this revision.
13	04/19/94	Pgs. 4 & 5; App. A; App. D; App. G; and App. I
14	6/26/95	Pgs. 7; App. C, p. 1; App. D, p.1; App. F, p.2
15	11/01/95	Revise PAR Diagram. All pages issued.
16	5/30/96	Reformat procedure; editorial changes; remove Form from Appendix F; revise PAR Form in Appendix I; add TSC Information Form to Appendix J; add Appendix K for Fitness-For-Duty Form (old Appendix J); all pages issued.
17	10/30/96	Revise PAR Diagram; redesignate Appendixes F through K to F through I; add reference to Appendixes F & G of CECC-EPIP-9. All pages issued.
18	4/7/97	Annual review, editorial changes, change data services reference to field staff, remove reference to quarterly dose limits. All pages issued.
19	6/9/98 ~~6/4/98~~ *RR*	Annual review, editorial changes, organization title changes. All pages issued.
20	10/6/98	Update position titles to reflect current organizations. All pages issued.

CECC-EPIP-7
CECC RADIOLOGICAL ASSESSMENT STAFF
PROCEDURE FOR ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY
REVISION LOG (Continued)

Rev. No.	Date	Revised Pages
21	2-22-99	PAR diagram revised. All pages issued.
22	5/1/99	PAR diagram revised. All pages issued.
23	7/16/99	Page 15, PAR form revised to remove hypothetical bounding option as it was redundant. All pages issued.
24	7/10/00	Annual review and self-assessment items. All pages issued.
25	8/17/00	PAR diagram revised. All pages issued.
26	2/5/01	Correct PAR diagram. All pages issued.
27	3/30/01	Annual review. Provide new PAR diagram, revise App. F to match PARs. All pages issued.
28	6/13/02	Annual review. Delete PAR Form which was combined with CECC Dir. PAR Form in CECC-EPIP-1, re-label Appendixes and references to them, editorial changes. All pages issued.
29	10/09/03	Annual review. Add instruction for RAM support of TVAN personnel responding to mitigate an emergency who will be located in the 10-mile EPZ. Editorial changes. All pages issued.

CECC RADIOLOGICAL ASSESSMENT STAFF PROCEDURE FOR ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY

1.0 PURPOSE

This procedure provides instructions for a consistent, accurate, and timely response by the Radiological Assessment Manager (RAM) and staff in the event of an accident. This procedure identifies the necessary information which is provided to the CECC Director to ensure that prompt, accurate, protective action recommendations for the public can be made by the CECC to appropriate State authorities.

2.0 SCOPE

This procedure covers the actions of the RAM and staff during an Alert, Site Area Emergency, and General Emergency.

3.0 REFERENCES

3.1 Radiological Emergency Plan

4.0 ABBREVIATIONS AND DEFINITIONS

CECC	- Central Emergency Control Center
DA	- Dose Assessment
EA	- Environs Assessment
EDS	- Environmental Data Station
ODS	- Operations Duty Specialist
RAC	- Radiological Assessment Coordinator
RAM	- Radiological Assessment Manager
REND	- Radiological Emergency Notification Directory
RMCC	- Radiological Monitoring Control Center
FSAR	- Final Safety Analysis Report
TLD	- Thermoluminescent dosimeter
TSC	- Technical Support Center
TVAN	- Tennessee Valley Authority Nuclear

5.0 RESPONSIBILITIES

*NOTE: Appendix F will be used to document fitness for duty when an individual is called and requested to respond to an emergency outside of normal work hours and from a non-duty status.

5.1 Radiological Assessment Manager

The RAM is notified of Alert or higher classification emergencies through the automated paging system which is activated by the ODS. If this system is not operable, the ODS will call the RAM. The RAM reports to the CECC. The RAM is responsible for notifying the members of the CECC Radiological Assessment Staff (i.e., Boardwriter, Rad Assessment Coordinator) that are not activated via the paging system.

The RAM is responsible for committing the support efforts of TVAN to the affected plant to deal with radiological aspects of the emergency. If TVAN cannot fulfill the needs of the affected plant, the RAM has the authority to seek help from other organizations within TVA. The RAM shall provide the CECC Director with periodic summaries of information needed for overall radiological accident assessment. He shall also provide the State with periodic updates of
* radiological information. The RAM shall coordinate any radiological protective support for any
* TVA personnel responding to mitigate the event who must remain in the EPZ (beyond the Site
* Boundary) after State ordered evacuations. Contact via the ODS (ODS refer to Agency
* Command Center Duty Roster). Coordinate with the Environs Assessor.

5.2 Radiological Assessment Coordinator

The RAC is responsible for supervising and coordinating the activities of the Radiological Assessment Staff, serves as the interface between the RAM and the staff, and for providing protective action recommendations to the RAM (see Appendix A). He is the primary contact between the Radiological Assessment Staff and the TSC for exchange of technical information (See Appendix E). He is the primary contact/interface between the TSC and the CECC for coordinating the emergency in-plant RADCON response. He obtains additional RADCON resources which may be required. This position is not activated via the automated paging system. The RAM will fulfill the duties of the RAC until the position is staffed.

5.3 Dose Assessment

Dose Assessment (DA) is responsible for the dose assessment activities of the CECC and for providing protective action recommendations to the RAM (see Appendix A) in the absence of the RAC. DA should activate additional staff members to fill the dose assessment positions in a timely manner, if warranted. DA shall ensure that communication occurs between the State staff and the DA staff for the exchange of technical information.

DA is responsible for providing a preliminary assessment concerning any new releases as soon as possible to the RAM. As necessary, DA shall ensure that all appropriate notifications are made of event termination.

*Revision

5.4 Environs Assessment

Environs Assessment (EA) supports the CECC by assessing offsite radiological conditions in close coordination with the State (through the Field Coordinator) and providing environmental monitoring results to the RAM for use in formulating protective action recommendations. EA draws upon available technical expertise to approximate the location, dimensions, and radiological characteristics of the plume. EA directs the efforts of TVA's emergency radiological monitoring personnel in the collection of field data in a safe and expeditious manner and coordinates analysis of environmental samples with laboratory supervision. EA coordinates the results of environmental assessments with DA. All other TVA radiological monitoring personnel are subordinate to EA and are responsible for following and implementing EA's directives. EA assists the State as requested to clarify technical assessments of offsite radiological conditions. EA provides technical support as requested for planning and reentry/recovery operations.

5.5 Field Coordinator

The TVA Field Coordinator is responsible for directing TVA emergency radiological monitoring personnel in the field in accordance with the instructions of EA. He coordinates the activities of TVA field personnel with the State in an effort to optimize the collection, analyses, and transfer of field data to State officials and the CECC. He maintains dose records and provides protective action direction for field personnel. He will provide Radiological Control (RADCON) support to field operations utilizing the sampling van teams and their equipment. The duties of the Field Coordinator may be assumed by EA.

6.0 PROCEDURES/REQUIREMENTS

6.1 Radiological Assessment Manager

NOTE: A checklist is provided in Appendix B.

6.1.1 Initial Actions

6.1.1.1 Review the emergency condition with the CECC Director and make a determination as to proper staffing of the Radiological Assessment staff, taking into consideration,

(1) Potential or actual need for offsite dose or environmental assessment, and

(2) Potential or actual need for inplant RADCON support.

6.1.1.2 Activate a RAC to coordinate radiological assessment activities, if sufficient personnel are available.

6.1.1.3 Ensure that the DA and EA have established appropriate staffing levels to perform radiological monitoring and dose assessment.

6.1.1.4 Ensure that communications have been established with the TSC RADCON Manager or Radiochemistry Supervisor.

6.1.1.5 Determine if technical support personnel are required and, if so, notify the appropriate personnel.

6.1.1.6 Verify that radiological information is being transmitted to the CECC.

6.1.1.7 Verify that the RAC is receiving timely accident assessment reports and this information is promptly distributed.

6.1.2 General Operations

6.1.2.1 * The RAM and the Plant Assessment Manager shall discuss all protective action recommendations to ensure that radiological and plant conditions are properly coordinated. (Appendix A of CECC EPIP-7 and Appendix I of CECC EPIP-1).

6.1.2.2 Ensure that accident assessment information is provided to the CECC Director on a frequent basis. These assessments shall provide summary information as well as appropriate recommended protective actions for the public.

6.1.2.3 Ensure that radiological information is provided hourly to the State radiological health authority.

6.1.2.4 Assess actual and projected releases to determine if doses result that would exceed any Emergency Action Level (EAL) limits. If EAL limits are exceeded report to the CECC Director for transmittal of the information to the SED.

6.1.2.5 If available NP personnel and equipment are not enough to cope with the emergency, contact the designated representative of other TVA organizations, as necessary, to supply adequate resources to recover from radiological aspects of the accident. Log the organizations called for assistance. Descriptions of emergency services and contacts are available in the REND.

6.1.2.6 Provide technical assistance to discuss the radiological aspects of protective action recommendations with appropriate State contacts as directed by the CECC Director.

6.1.2.7 Should the accident be expected to last for an extended period, the RAM originates a schedule for relief. He also directs his staff to prepare a schedule for their relief to ensure that necessary Radiological Assessment staff is available for the duration of the emergency.

6.1.2.8 Authorize emergency dose limits for offsite personnel.

6.1.2.9 The RAM and staff support the CECC Director as required for carrying out recovery efforts from the accident.

6.1.2.10 Upon termination of the emergency, the RAM and staff shall make themselves available for review of the accident.

6.1.2.11 The RAM checklist is provided in Appendix B for quick reference by the RAM.

*Revision

6.2 Radiological Assessment Coordinator

NOTE: A checklist is provided in Appendix C.

6.2.1 Initial Actions

6.2.1.1 Upon arrival at the CECC, become familiar with plant conditions and radiological assessment activities.

6.2.1.2 Brief the RAM when prepared to assume responsibility for coordinating radiological assessment activities.

6.2.1.3 Brief the RAM on the status of dose assessment staffing preparations.

6.2.1.4 Contact the TSC of the affected plant and coordinate receipt of data from the TSC and transmission of CECC data to the TSC.

6.2.2 General Operations

6.2.2.1 Supervise and coordinate the activities of the staff and keep the RAM informed on staff activities.

*6.2.2.2 Provide protective action recommendations to the RAM (Appendix I of CECC-EPIP-1) based on dose assessments or field measurements.

6.2.2.3 * Ensure that data generated by the Radiological Assessment Staff (Appendix E and the affected sectors portion of Appendix I in CECC-EPIP-1) are transmitted to the TSC routinely.

6.2.2.4 Assist, as needed, the staff and the TSC in obtaining special or nonroutine data.

6.2.2.5 Assist in obtaining additional RADCON resources (manpower, equipment, supplies, and vendor services) which may be required.

6.2.2.6 Serve as the primary contact/interface between the TSC and the CECC for coordinating the emergency in-plant RADCON response.

6.2.2.7 Provide or assist in obtaining such support as needed for continuing operations of the staff.

6.2.2.8 Provide other assistance as directed by the RAM.

6.3 Dose Assessment

NOTE: Checklists are provided in CECC EPIP-8.

Dose assessors provide draft protective action recommendations for protection of the public.

*Revision

6.3.1 Initial Actions

6.3.1.1 When warranted, activate or place on standby additional Dose Assessment staff.

6.3.1.2 Upon arrival at the CECC, initial notifications and assessments shall be recorded as described in CECC EPIP-8.

6.3.1.3 Brief the RAC (or RAM, as appropriate) on the status of dose assessment staffing preparations.

6.3.2 General Operations

6.3.2.1 Perform functions as described in CECC EPIP-8.

6.3.2.2 Ensure that shift changes occur as described in CECC EPIP-8.

6.3.2.3 Provide other assistance as requested by the RAC.

6.4 Environs Assessment

6.4.1 Initial Actions

NOTE: A checklist, which includes turnover from TSC, is provided in Appendix D.

6.4.1.1 When conditions warrant, activate the Field Coordinators, and activate or direct a Field Coordinator to activate field monitoring personnel using the REND. The screening van is activated by notifying the laboratory supervisor to dispatch the screening van.

6.4.1.2 Activate the EP Field Support Staff.

6.4.1.3 Establish and maintain an environs assessment log. Record key events, notifications, etc. Field data need not be recorded in the log.

6.4.1.4 Obtain and record the field data collected by the plant team from the TSC and assume coordination of field operations if appropriate per Appendix D.

6.4.1.5 Brief the RAC (or RAM, as appropriate) on the status of environs assessment staffing preparations.

6.4.1.6 Ensure that field data are transferred to the State until the Field Coordinator is operating at the RMCC.

6.4.2 General Operations

6.4.2.1 If a senior instrument mechanic is requested for the EDS, notify the TSC that the request has been made.

6.4.2.2 Provide instructions to the Field Coordinator as necessary to maintain field operations. If conditions warrant, EA may assume the responsibilities of the Field Coordinator. If appropriate for the emergency situation, request permission from the RAM for field team personnel to exceed annual dose limits. Keep the Field Coordinator advised on matters related to radioiodine offsite and any need for potassium iodide to be administered to field personnel. Authorization for emergency doses and KI use should be indicated on the authorization form contained in EPIP-9, Appendix E. The RAM should advise the CECC Director of any dose extension or KI administration and recommend that the SED be informed.

6.4.2.3 Provide emergency classification, plant status, release data, projected doses, and protective actions for the public (recommended or implemented) to the Field Coordinator for transfer to the field teams. This action should not interfere with the flow of operational information.

6.4.2.4 Coordinate the transportation of teams as needed. Resources are listed in the REND.

6.4.2.5 Receives field data from Field Coordinator via facsimile or by transcribing from radio transmissions. The data are recorded on a form similar to CECC-EPIP-9, Appendix I. An effort shall be made to keep I-131 concentrations associated with general exposure rate measurements for a given place and time.

6.4.2.6 As necessary, EA shall ensure special local monitoring of groundwater is conducted in the event of a liquid radioactive release (BFN Final Safety Analysis Report requirement).

6.4.2.7 EA shall arrange for relief for EA personnel and the Field Coordinator. Shift turnovers are to be performed.

6.4.2.8 Provide technical assistance and field monitoring as requested by the State during the recovery phase for planning and operations.

6.4.2.9 Provide other assistance as requested by the RAC.

6.5 Field Coordinator Activities

6.5.1 Initial Actions

6.5.1.1 Refer to CECC-EPIP-9 for additional instructions.

6.5.1.2 Upon arrival at the RMCC, establish radio and telephone communications with the CECC. Establish and maintain a Field Coordinator's log, including such information as key events and requests.

6.5.1.3 Assume coordination of field staff as directed by EA.

6.5.2 General Operations

6.5.2.1 Coordinate TVA's field operations with State field operations management in an effort to minimize duplication of effort and optimize efficiency in field monitoring. The Field Coordinator will follow the directives of EA, who is responsible for TVA's overall monitoring effort.

6.5.2.2 Define individual team priorities as needed to acquire field data requested by Environs Assessor. The Field Coordinator may alter field team practices and procedures provided that the changes do not alter protective action requirements, or techniques and methods of sampling, sample analysis, or direct surveys.

6.5.2.3 Monitor and maintain individual exposures and provide instructions as necessary to keep below 10 CFR 20 limits. No team member is permitted to exceed 5 rem TEDE without emergency dose authorization of the RAM. Exceeding 10 rem TEDE, and greater than 25 rem TEDE, both require additional authorizations at each level by the RAM. Refer to CECC EPIP-9 for additional instructions on implementation of emergency dose levels.

6.5.2.4 Record all field data per CECC-EPIP-9. Provide the appropriate copy to the State and the other to the facsimile operator for transmission.

6.5.2.5 Arrange for maintenance of field operations as needed, including resupply of vans, relief personnel, replacement vehicles and equipment, food for teams, etc. Brief the relief teams at the RMCC and provide them with TLDs and KI. Coordinate these activities with EA.

6.5.2.6 Respond to other requests from EA and coordinate with EA TVA's response to requests received from the State.

APPENDIX A
PROTECTIVE ACTION RECOMMENDATIONS

Note 1: If conditions are unknown utilizing the flowchart, then answer NO.

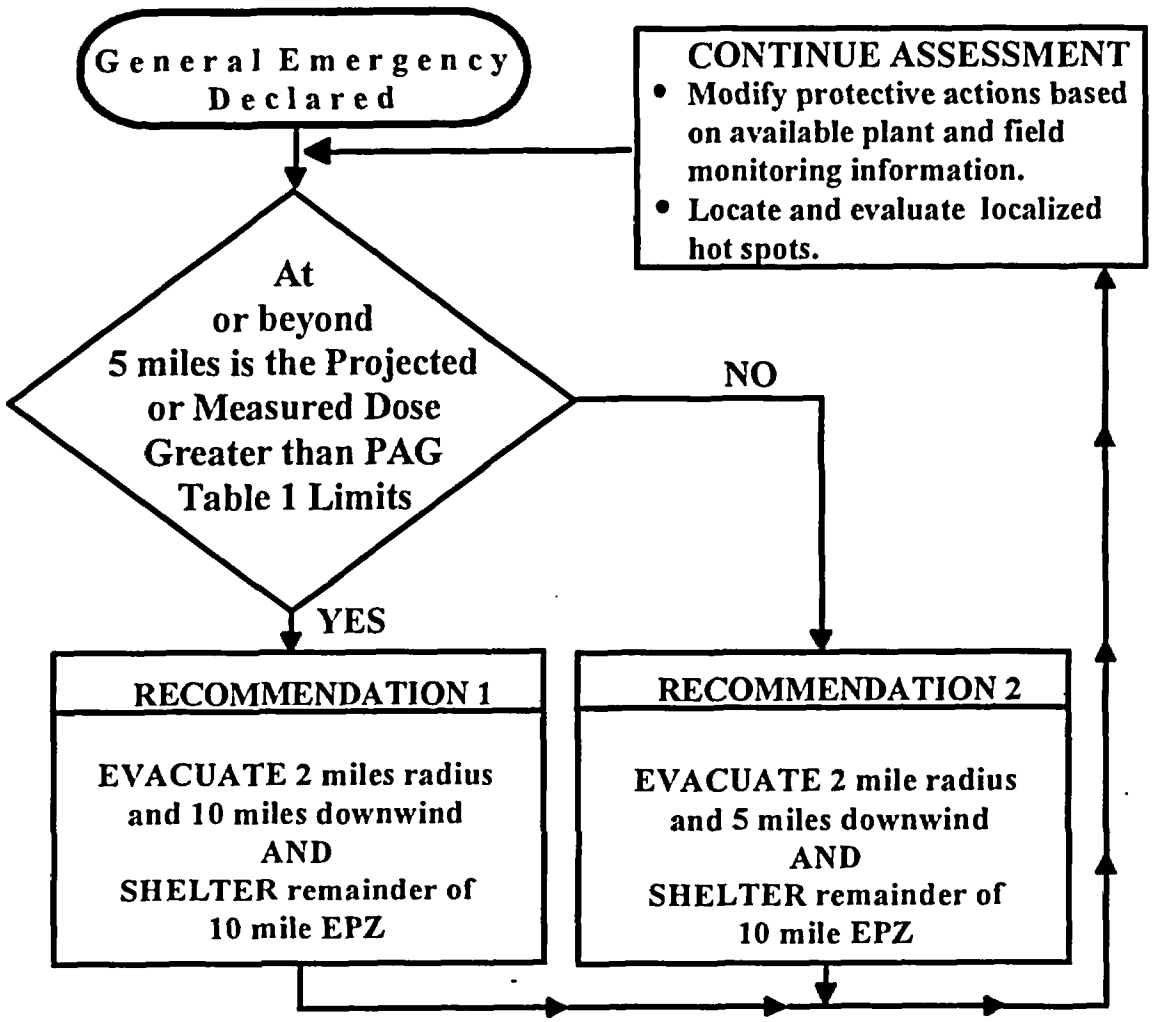


TABLE 1
Protective Action Guides

TYPE	LIMIT
Measured	3.9E-6 microCi/cc of Iodine 131 or 1 REM/hr External Dose
Projected	1 REM TEDE or 5 REM Thyroid CDE

APPENDIX B Page 1 of 1
RADIOLOGICAL ASSESSMENT MANAGER'S CHECKLIST

INITIAL ACTIONS Date: _____

Time/Initials

____/____ Notify the CECC Director of Radiological Assessment Staff activation status. Activate a RAC and a Boardwriter.

____/____ Assess the need for additional technical support and take appropriate actions.

____/____ Establish communications with the TSC RADCON Supervisor or Radiochemistry Supervisor to determine radiological status of the plant and to determine if any releases are ongoing or have occurred.

____/____ Establish contact with the state.

____/____ Verify that radiological data are being transmitted to the CECC.

____/____ Verify that the Radiological Assessment Coordinator is receiving accident assessment reports and that the information is being distributed.

____/____ Obtain RADCON Technical Advisors as necessary.

____/____ Evaluate preparations for collection of environmental TLD's.

GENERAL OPERATIONS

1. Log key events and major actions taken.

2. Coordinate protective action recommendations with the Plant Assessment Manager.

3. Monitor actual or projected doses for EAL trigger points and notify the CECC Director if a EAL condition is met.

4. Provide accident assessment information to the CECC Director and the State Communicator at least hourly.

5. Arrange for additional RADCON support resources with other TVA organizations. Log all contacts.

6. Periodically provide for technical discussions with the State as needed.

7. Remind the site that additional technical support may be available through the CECC. Coordinate with the Plant Assessment Manager and the Site Emergency Director.

8. Ensure that Radiological Assessment Staff relief personnel are scheduled and notified. Coordinate transportation arrangements as needed.

9. Ensure that radiological data posted on CECC Radiological status boards is accurate and up-to-date.

*10. Coordinate any radiological protective support for any TVA personnel responding to mitigate the
* event who must remain in the EPZ (beyond the Site Boundary) after State ordered evacuations.
* Contact via the ODS (ODS refer to the Agency Command Center Duty Roster). Coordinate with the
* Environs Assessor.

*Revision

APPENDIX C Page 1 of 1

RADIOLOGICAL ASSESSMENT COORDINATOR'S CHECKLIST

INITIAL ACTIONS Date: _____

Time/Initials

____/____ On arrival, become familiar with emergency status, plant conditions, and CECC activities.

____/____ Inform the Radiological Assessment Manager when prepared to assume responsibility for coordinating staff operations.

____/____ Contact the TSC and coordinate receipt of data from the plant and transmissions to the plant from the CECC (Appendix E).

GENERAL OPERATIONS

1. Log key events and major actions taken.
2. Supervise and coordinate the activities of the Radiological Assessment Staff.
3. Provide protective action recommendations to the RAM based on dose assessments or field measurements.
4. Periodically advise the Radiological Assessment Manager of staff activities.
5. Ensure that data generated by the Radiological Assessment Staff are transmitted to the TSC routinely.
6. If needed, assist the staff and/or TSC in obtaining special or nonroutine data.
7. As directed, assist in obtaining additional resources (manpower, equipment, supplies, vendor services).

APPENDIX D Page 1 of 2

ENVIRONS ASSESSMENT INITIAL CHECKLIST

INITIAL ACTIONS Date: _____

Time/Initials

____/____ If warranted, activate the Field Coordinator, and activate or direct the Field Coordinator to activate offsite field monitoring personnel or screening van using the REND (teams must be dispatched for Site Area Emergency or higher).

____/____ Activate the EP Field Support Staff (see REND, under the tab, Field Staff).

____/____ Establish contact with the TSC and notify if a Senior Instrument Mechanic (SIM) has been activated for EDS from the EP Field Support Staff.

____/____ Brief the Radiological Assessment Coordinator and Radiological Assessment Manager on the status as activities.

____/____ Test radio communications to determine the repeater to be used and set correct time on radio console.

FIELD TEAM TURNOVER FROM SITE

____/____ Determine location and status of all field teams from the site.

____/____ Identify all field team members.

____/____ Request the site to notify the teams when command and control has been assumed by the CECC.

____/____ Assume control of all Field Staff.

____/____ Verify that field data are being transmitted to the State until RMCC is staffed and operating.

____/____ As appropriate, transfer coordination of field activities to the Field Coordinator at the RMCC. Notify all field teams of any transfer of command and control.

APPENDIX D Page 2 of 2
ENVIRONS ASSESSMENT INITIAL CHECKLIST

GENERAL OPERATIONS

1. Log notifications, instructions received and given, emergency classifications, and key events in an environs assessment log.

2. Remain aware of offsite conditions in order to provide decisions regarding KI for teams.

3. Request permission for individual field team members to exceed annual dose limits, if warranted for continued operations.

4. Periodically provide field teams with emergency classification, plant status, release data, projected doses, meteorological data, and/or protective action recommendations for the public, provided this does not interfere with field operations or communications.

5. * Ensure CECC is informed of data received from RMCC or transcribed from radio on Appendix G of CECC-EPIP-9. Keep related exposure rates and airborne concentrations together on the form.

6. As necessary, ensure that in the event of any unusual release of radioactive liquid which could contaminate groundwater at the site, special local monitoring is conducted to ensure that the use of local groundwater will not result in undue hazards to any person (BFN FSAR requirement).

7. When directed by the Radiological Assessment Manager, arrange for relief personnel for Environs Assessment, and the Field Coordinator.

8. * * * * Coordinate any radiological protective support for any TVA personnel responding to mitigate the event who must remain in the EPZ (beyond the Site Boundary) after State ordered evacuations. Contact via the ODS (ODS refer to the Agency Command Center Duty Roster).

*Revision

APPENDIX E Page 1 of 1
TSC INFORMATION FORM

Approved:

Date/Time: _____

I. DOSE ASSESSMENT INFORMATION
As dose assessments are performed, they are automatically transmitted to TSC. At least hourly, verify last dose assessment was received.

Time of Last Dose Code Run: Date: _____ Time _____

II. PLUME PLOTS
Whenever a dose assessment is performed, the plume position plot is also transmitted to site by telecopy. This is not automatically performed. At least hourly, verify last plot was received.

Time of Last Plume Plot: Date: _____ Time _____

III. FIELD DATA
As Field Data is received, transmit hard copy to TSC. At least hourly, verify data is being received.

Time of Last Field Data: Date: _____ Time _____

IV. METEOROLOGICAL DATA (Including Met Forecasts)
Met Data is automatically transmitted to the TSC. At least hourly, verify data is being received.

Time of last Met Data: Date: _____ Time _____
Time of last Met Forecast: Date: _____ Time _____

V. TVA RECOMMENDED PROTECTIVE ACTIONS
When TVA makes a recommendation, transmit to the TSC. At least hourly, verify TSC is knowledgeable of last recommended protective actions.

Protective Action Recommendation of: Date: _____ Time _____
Description:

VI. PROTECTIVE ACTIONS TAKEN BY STATE
When State takes a protective action, transmit to the TSC. At least hourly, verify TSC is knowledgeable of last protective actions taken.

Protective Actions Taken as of: Date: _____ Time _____
Description:

APPENDIX F Page 1 of 1
FITNESS FOR DUTY PROGRAM ADMINISTRATION

TVA NUCLEAR
CALL-IN SHEET

Person Calling: ______________________ Date: ______________

Name	Time Called	Time Needed to Report	Alcohol 5 Hrs. Prior to Report (Y/N)	Fit for Duty (Y/N)	Duty Official Comments

CECC EPIP Coversheet

Tennessee Valley Authority CENTRAL EMERGENCY CONTROL CENTER EMERGENCY PLAN IMPLEMENTING PROCEDURES	Title DOSE ASSESSMENT STAFF ACTIVITIES DURING NUCLEAR PLANT RADIOLOGICAL EMERGENCIES	CECC EPIP-8 REV. 27 Effective Date: 10/09/03

WRITTEN BY: Thomas E Collins (Signature) REVIEWED BY: David Pond (Signature) 10/03/03 (Date)

PLAN EFFECTIVENESS DETERMINATION: Thomas E. Collins (Signature) 9/10/03 (Date)

CONCURRENCES

Concurrence Signature	Date
☒ Manager, EP Program Planning and Implementation David Pond	10/03/03
☒ Manager, Emergency Preparedness B K Mahr	10/3/03
☒ Manager, Radiological and Chemistry Services R Chandramouli	10/07/03
☐	

APPROVAL

APPROVED BY: James E. Maddox (Signature) VP Eng & Tech Svcs (Title Organization) 10/7/03 (Date)

CECC-EPIP-8
DOSE ASSESSMENT STAFF ACTIVITIES
DURING NUCLEAR PLANT RADIOLOGICAL EMERGENCIES
REVISION LOG

Rev. No.	Date	Revised Pages
0	3/22/88	All (Changed from IPD to EPIP)
1	11/18/88	2-7, Apps. A, B, C, & D
2	12/12/88	Appendix A
3	4/26/89	All
4	9/19/89	App. C
5	10/26/89	All
6	5/21/91	App. B, pgs. 1-4; Appendix C, pgs. 1-2; App. D, pg. 1
7	10/17/91	App. B, pgs. 2-4; App. C, pg. 1.
8	05/13/93	1-4; App. A; App. B, pg. 1, 3, & 4; and App. G; App. C deleted. All pages issued.
9	11/22/93	Pg. 4; App. B, pgs. 1&4; App. D changed to App. C; App. E changed to App. D; App. F changed to App. E; and App. G changed to App. F.
10	11/30/93	1, 3, 4; App. A, pg. 1; App. B, pgs. 1-2; App. C, pg. 1-5; App. D, pg. 1; App. E, pg. 1; App. F, pg. 1; App. G, pgs. 1-6.
11	06/24/94	App. B, pg. 1; App. D, pgs. 2-5; App. F; App. J added. All pages issued.
12	6/27/95	Pg. 1; App. A; App. B, p.3; App. C, p. 5; App. D, p. 2; App. G, pgs. 4 and 6
13	1/17/96	App. B, pg. 2, editorial changes, add table for BFN stack release; App. C, pgs. 1 & 3, Add new criteria for Type I and Type II releases; App. D, pgs. 2-5, add nonogram alignment checks
14	5/30/96	Pg. 3, App. A, App. B, App. C, App. D, App. F, App. G; annual review; ground level release tables and nomograms made generic to all three sites; all pages issued.
15	10/30/96	Pg. 3, App. B, and App. D; Add reference to App. I of CECC EPIP-7, remove deleted pages, make correction to Nomogram Alignment Check Table.
16	5/30/97	Editorial changes, update manual dose assessment methodology, update preliminary assessment table, revise river miles on tables in Appendix G, annual review. All pages issued.
17	8/8/97	Revise default river flow rate for BFN, revise responsibilities of Norris Lab, add water intake tables. All pages issued.

REVISION LOG (Continued)

Rev. No.	Date	Revised Pages
	6/9/98	
18	~~6/4/98~~ *RR*	Annual review. Organization title changes. In Appendix D clarify Type I and Type II formulas. Remove Tennessee River miles from tables. All pages issued.
19	10/27/98	Correct reference to CECC EPIP-1 Appendix on Appendix J.
20	5/20/99	Annual review. Editorial and clarification changes, revise public water use tables. All pages issued.
21	9/8/00	Annual review. Editorial changes. All pages issued.
22	3/30/01	Revised to incorporate the new source term methodology in the RED suite of codes revision
23	11/22/02	Revised all pages to reflect human factor improvements in REP codes and manual Included changes due to code revision necessary for H-3 project.
24	3/31/03	Added sections to Appendix F to provide instructions for manual method of calculating TEDE and thyroid CDE doses at Site Boundary (0.62 miles). All pages issued.
25	6/16/03	Make corrections to Appendix F. All pages issued.
26	07/01/03	Revision consistency in accordance with CHPER 03-000257-000. Revise location indicator in step C.4 on page 18. Correct the location indicator, in step 2.b on page 19. Correct spelling of Circle on page 22. Minor format alignment changes. All pages issued.
27	10/09/03	Add clarification note for PAG values for low wind speed or low release rates, current WBN default river flow value. All pages issued.

Table of Contents

DOSE ASSESSMENT STAFF ACTIVITIES DURING NUCLEAR PLANT RADIOLOGICAL EMERGENCIES

1.0 PURPOSE

To guide Dose Assessment in obtaining necessary information, calculating dose rates and doses, and communicating assessment results used in responding to radiological emergencies at nuclear power plants.

2.0 SCOPE

This procedure applies to activities of Dose Assessment in actual and hypothetical radiological emergency situations. While the activities of the Dose Assessment staff are expected to follow this procedure, it is expected that circumstances may arise during an event which will void portions of this procedure. Therefore, this procedure is a guide for the operation of the Dose Assessment staff under the ideal conditions.

3.0 STAFFING

3.1 Activation and Notification

The Initial notification of an event comes from the Operations Duty Specialist via the Emergency Paging System (EPS) or manual callout. Additional Dose Assessor support is contacted in accordance with Appendix A. The Dose Assessor is a position required for the CECC to make Protective Action Recommendations and to meet minimum staffing levels.

Upon reporting to the CECC, perform initial activities in accordance with the checklist provided as **Appendix A.**

3.2 Shift Change

Shift change notification and transition and transfer of responsibilities should be conducted in accordance with the Dose Assessment Shift Change and Termination Checklist (Appendix B).

3.3 Termination

Termination of an event should include the following actions and follow the Dose Assessment Shift Change and Event Termination Checklist (Appendix B).

4.0 DOSE ASSESSOR INTERFACES

4.1 Radiological Assessment Manager / Coordinator (RAM/RAC)

The Dose Assessor should interface directly with the Radiological Assessment Coordinator (RAC). In the absence of the RAC, communication is provided directly to the RAM. Requests for any special-case assessments should come to Dose Assessment through the RAC/RAM or be cleared by the RAC/RAM prior to their performance.

Dose Assessment is responsible for performing the offsite dose assessment activities of the CECC in order to determine Protective Action Recommendations using the appropriate appendix in CECC EPIP-1. Dose assessment results are also evaluated against criteria for declaration of Emergency Classification levels, and evaluations are communicated to the RAM/RAC.

Dose Assessment should provide results of all dose assessments and plume plots from FRED to the RAC/RAM, who will approve them and distribute them to CECC staffs. Initial dose assessments (those made at the start of an event or when the conditions have changed significantly as defined in this procedure) will receive the approval of the RAC/RAM and then are transmitted to the TSC and the State. Under most other conditions, the results are directly transmitted to the TSC and the State on the State Update form via computer spooling. However, if the computer spooling is unavailable, then the Dose Assessor shall prepare a State Update form manually as defined in EPIP-1. CECC Clerical staff have instructions for distribution.

Dose Assessment should provide to the RAC/RAM copies of plume plots from RED for ongoing releases or plots of estimated centerline location (if there is not a known release but potential exists for one to occur). This information should be transmitted by the RAC/RAM to the CECC, TSC, and State. Dose assessment will also support post event recovery efforts.

4.2 Meteorologist (MET)

The CECC Meteorologist is responsible for providing to Dose Assessment the real time and forecast meteorological data and associated advice on atmospheric dispersion and transport. If a meteorologist is not initially available for response to the CECC, support can be obtained from Muscle Shoals. Telephone and pager numbers for the Muscle Shoals response personnel are available in the REND.

Meteorological data is provided to the CECC by computer inputs and by the CECC meteorologist. In the event of a monitored airborne release, the 15-minute meteorological data is automatically accessed by the RED and FRED codes. This data should be verified against the distributed meteorological data or by the meteorologist. The meteorologist is also available to convert flow rates to exit velocities for use in the codes. The meteorologists will also provide forecast information for use in the FRED code.

4.3 Environs Assessor/Field Coordinator

Dose Assessors provide plume plots to the CECC Environs Assessor and to the Field Coordinator at the Radiological Monitoring Control Center (RMCC) via the RAC. These plume plots are used to assist with decisions on field team deployments. Real time plume plots from the RED code are to be distributed to the EA/FC and the State for that purpose.

Field data is also shared to assist with comparison of dose projections with field measurements. This comparison can assist with evaluations if field teams are at maximum centerline locations, or if reported plant release rates coincide with actual field measurements.

In the event of an unmonitored release from a site, field team data can be used in the BRED code to assist with determination of a release rate.

4.4 Core Damage Assessors

The CECC Core Damage group (in Plant Assessment) is responsible for supplying Dose Assessment with projections of potential, anticipated, and/or worst-case release rates and pathways.

4.5 Technical Support Center (TSC)

The TSC is a source of information for radioactivity release rates, pathways, flow rates, and information on plant status and prognosis. The primary point of contact is TSC Chemistry. Release information is also available via the Integrated Computer System (ISC) using the CECC computers.

4.6 River Operations

River Operations may assist in providing Dose Assessment information on water dispersion characteristics for releases to the river. This information may be used in running the WATERDOSE code, or for use of the manual methodology if the dose code is unavailable.

4.7 State (Radiological)

Dose Assessment shall ensure that communication with the State Dose Assessment Team is established and maintained. The State should be given hourly updates, as a minimum. These updates should include discussions of all technical information relative to dose assessments being made (incoming release rates, assumptions used, problems with information flow). The State should also be contacted if the conditions have changed significantly as defined in this procedure. DO NOT discuss protective action recommendations with the State.

5.0 PERFORMING DOSE ASSESSMENTS

5.1 Data Verification

All dose assessment results (computer generated or hand calculated) involving data input will be verified by a second party verifier. The verifier may be a Dose Assessor or the RAM/RAC. The verifier will verify the accuracy and appropriateness of data input and reasonableness of the results. Both preparer and verifier will initial and date the results page of the assessment (e.g., State Update Form for FRED assessments).

5.2 Preliminary Assessments

Dose Assessors should provide results of all preliminary assessments to the RAC/RAM. Preliminary Assessments are provided as part of a FRED run. Preliminary assessments will be performed at the start of an event or when the conditions have changed significantly as defined in this procedure.

5.3 Criteria for a Significant Change in Conditions

Criteria for a significant change which will require a new dose assessment run are:

- the release type / path has changed,
- the release rates have changed by a factor of 10
- the stability class has changed by 2 classes,
- or the wind speed has changed by a factor of 2.

5.4 FRED or RED Assessments - Collection of Data

Gather information as provided on Appendix C. Sources of information may include the Technical Support Center (Chemistry), ICS, CECC Meteorologist or CECC Core Damage Assessors. Refer to Appendix C for instructions on running the dose codes.

5.5 Preparing a Protective Action Recommendation (PAR)

TVA must satisfy regulatory requirements to provide State Authorities a PAR within 15 minutes of the declaration of a General Emergency. Therefore, Dose Assessors should anticipate and initiate development of a PAR to allow ample time for review, approval and transmittal to State Authorities.

A Protective Action Recommendation for airborne releases is determined based upon results of a FRED run. If the FRED program is unavailable, then the manual methodology should be utilized as provided in this procedure. A PAR form contained in CECC EPIP-1 should be completed, with attention to identification of affected sectors as page 2 of that document..

Dose Assessment should provide technical guidance to the RAC/RAM in the preparation of protective action recommendations based on dose assessments. The RAC is responsible for written preparation of recommendations to the RAM.

5.6 Changes in Conditions for a PAR

Changes to a PAR must be communicated to the State by the CECC Director within 15 minutes of determination. Criteria for a changes which will require evaluation a new PAR are:

- the release type / path has changed,
- the release rates have changed by a factor of 10
- the stability class has changed by 2 classes,
- or the wind speed has changed by a factor of 2.
- a wind direction change resulting in a change of an affected sector

5.7 BRED Assessment - Back Calculation of Release Rate from Measured Field Data

Measured field data (consisting of dose rates in mrem/hr and I-131/H-3 concentrations) are assessed in several ways. If there is a monitored release ongoing, the field data are compared to the results of the most applicable data produced by the RED or FRED computer models.

However, in cases where the release is unknown or questionable, the field data are then input into the BRED computer model to determine the applicable release rates. These calculated release rates are then input into the RED/FRED codes, as applicable, which can be used to perform dose assessments and any applicable Protective Action Recommendation (PAR).

5.8 Comparison of Measured Field Data to Dose Projections

Field data is compared with dose projections to assist with evaluations if field teams are at maximum centerline locations, or if reported plant release rates coincide with actual field measurements. Appendix G is provided as a reference to perform comparisons.

5.9 WATERDOSE Assessments

Liquid releases to the River are assessed using the WATER DOSE code as provided on Appendix H. If the WATER DOSE code is unavailable, a manual methodology is provided as Appendix I.

5.10 Manual Methodologies for Dose Assessments

In the event that the FRED, RED or WATERDOSE computer codes are unavailable, instructions are provided in the Appendixes of this procedure for manual calculation methods. In consideration that the computer programs also normally spool data outputs directly to the State, the Dose Assessor will need to ensure that the applicable pages of the State Update Form, contained in CECC EPIP-1, are also manually completed and transmitted accordingly.

6.0 REFERENCES

FRED User's Manual
RED/FRED/BRED Documentation
FRED User's Manual
WATERDOSE User's Manual
BRED User's Manual
Model Comparison
REP CODE Revision 2, Specifications and Documentation, August 2002, L61 020814 800

7.0 ABBREVIATIONS AND DEFINITIONS

CECC - Central Emergency Control Center
CTM - Containment building
SGTR (above) - Steam Generator Tube Rupture above the steam generator water level
SGTR (below) - Steam Generator Tube Rupture below the steam generator water level
MSLB - Main Steam Line Break
TSC - Technical Support Center
EPS - Emergency Paging System
RED - Radiological Emergency Dose Code
RO - River Operations
FRED - Forecast Radiological Emergency Dose Code
BRED - Back-calculation Radiological Emergency Dose Code
TRM - Tennessee River Mile
ICS - Integrated Computer System
WGDT - Waste Gas Decay Tank (as in rupture event)
RAM/RAC -Radiological Assessment Manager or Radiological Assessment Coordinator

APPENDIX A
Dose Assessor Initial Reporting Checklist
(steps do not need to be performed in sequential order)

1. **SIGN IN** on the CECC staffing board and don your CECC position tag.

2. **START** logkeeping of key activities and notifications in the position logbook.

3. **ENSURE** that the following support staffs are notified and/or staffed. Refer to the REND call out list for contact information.
   - Second Dose Assessor, if needed.
   - Muscle Shoals Meteorologist (if serving as CECC pager duty person).

4. **CONFIRM** position notebook procedures match revision levels in controlled copies.

5. **ESTABLISH** contact with the TSC Chemistry (programmed on phone and in REND section B). Ascertain if a release has been, or is occurring. **IF YES, INITIATE** a dose assessment as noted below.

6. Perform preliminary assessments and dose projections.

7. **ESTABLISH** initial contact with the State Radiological Dose Assessment staff (programmed on phone and in REND section B).

8. **OBTAIN** a briefing from the RAC/RAM and **INFORM** the RAC/RAM when the activities above are completed. Report/request if a radiological release has been, or is occurring.

NOTES: **COMPARE** dose assessment results against the levels for the declared REP class and advise the RAC/RAM to advise the TSC if an upgrade is indicated.

For Preliminary Assessments and Dose Projections use the **FRED** Code (Appendix C and D).

For Plume Plots to track actual releases in current time, use the **RED** Code (Appendix C and D).

When the plant release rate is unmonitored or questionable, use the **BRED** code to arrive at a plant release rate based upon Field Team data. (Appendix E).

For releases to the River, use the **WATERDOSE** Code (Appendix H)

If computer problems are encountered, immediately contact Computer Support.

If the FRED computer code is inoperative, use the **MANUAL METHODOLOGY** to assess airborne radioactivity releases (Appendix F).

If the WATERDOSE computer code is inoperative, use the **MANUAL METHODOLOGY** to assess liquid releases to the river (Appendix I and J).

APPENDIX B

Dose Assessor Shift Change and Termination Checklist

1. The following should be discussed between staff for Shift Turnover.

- Current release data and projections.
- Current met data and projections.
- Current plant status and projections.
- Current environs data and projections.
- Pertinent historical data/plant conditions
- Status of any Protective Action Recommendations made and the rationale for these
- Status of any (incoming or outgoing) unfulfilled requests for information.
- Dose methodologies being used.
- Identification of problems in response capability.
- Identification of contacts at the TSC, State, Core Damage staff and RO
- Time for next periodic update to the State
- Time for next periodic update of the RED plume plot
- Identify individuals external to CECC who were activated or placed on standby

2. Transfer of Shift Change Responsibility

- Obtain approval from the RAC for the transfer of responsibility
- The on duty Dose Assessment Staff should remain available or at least respond in case transfer problems are identified

3. Termination

- Log off CECC computer system/turn off plotters.
- Notify all on-call staff of event termination, such as:
  - Meteorologist (if staffed in Muscle Shoals)
  - Additional Dose Assessment staff on standby
  - River Operations
- Collect and turn in all records to the EP staff

Appendix C Page 1 of 2

FRED RED Data Inputs

FRED / RED Data Inputs

NOTE: The source for this information may be the site Technical Support Center or from ICS.

1. **Plant:** ☐ BFN ☐ SQN ☐ WBN

2. **Meteorological data will be:** ☐ **ACTUAL** or ☐ **EXERCISE** (confirm with drill controller).

3. **Release start time:** _____ ☐ Eastern ☐ Central

4. **Elapsed Time from reactor shutdown to start of release:** _____ (hours) (enter 0 if Rx under power)

5. **Release Vent Type** (this is used by the code to calculate effective plume height):

SQN/WBN	***BFN***
☐ Shield Bldg	☐ Stack
☐ Near ground	☐ Radwaste Zone (of Rx Bldg)
	☐ Refueling Bldg zone (of Rx Bldg)
	☐ Reactor Bldg zone (of Rx Bldg)
	☐ Turbine Bldg zone (of Rx Bldg)
	☐ Near ground

6. **Effluent flow rate (exit speed)** (if measured and available): _____ cfm.

NOTE: Consult with the meteorologist as to whether the default Exit Velocity based on this flow rate should be over-ridden. Code defaults can be used for conservatism or if flow data is unavailable.

7. **Release Type:**

☐RCS ☐Gap ***(default)*** ☐Core Damage ☐Fuel Melt ☐User Specified (for noble gas and Tritium only)

NOTE: **Initially, a GAP Release Type should be used** unless otherwise specified by the Core Damage Assessment team. Alternately, particulate-to-I^{131} field team air concentration data can be used as follows:

$$\frac{\text{Field Team Data Particulate microCi/cc}}{\text{Field Team Data Iodine}^{131}\text{ microCi/cc}} = \text{Ratio}$$

Ratio = Release Type:	*Gap*	*Core Damage*	*Fuel Melt*
	≥ 0.18	≥ 2.0	≥ 3.5

FRED / RED Data Inputs

FRED RED Data Inputs

8. **Release Path:**

SQN/WBN

☐ **Filtered** via containment (CTM)
☐ **Unfiltered** via containment (CTM)
☐ SGTR with rupture located **BELOW** water level
☐ Steam Generator Tube Rupture with rupture located **ABOVE** water level
☐ Turbine Bldg
☐ Reactor Bldg
☐ Auxiliary Bldg.

BFN

☐ Stack (filtered)
☐ Stack (unfiltered)
☐ Turbine Bldg, Reactor Bldg
☐ Main Steam Line Break (MSLB)

9. **Release rates:**

Basis for rates: ☐ Monitor reading ☐ Plant personnel ☐ BRED estimate

_____ µCi/s Noble Gas

_____ µCi/s I-131 (pre-treatment value only, if available)

_____ µCi/s Total Particulate (pre-treatment value only, if available)

_____ µCi/s H-3 (if applicable see note below)

NOTE:

- For a TPBAR handling accident, the H-3 release can be estimated as:

$$\text{H-3 Release Rate} = \frac{\mu\text{Ci/cc H-3} \times \text{cfm} \times 28320\ \text{cc/cf}}{60\ \text{min/sec}}$$

{ H-3 release (µCi/s) = #µCi/cc H-3 x building exhaust flow rate (cfm) x 28320 cc/cf x 1/60 min/s }

- For a WGDT Rupture accident, the default H-3 release is 2500 Ci over one hr or 6.94E+05 µCi/s for 1 hr

Appendix D Page 1 of 2

FRED RED Code Runs

FRED or RED Assessment of Airborne Releases

1. **DOUBLE CLICK** on the "CECC VAX" icon if the VAX User Window is not displayed on computer screen. Depress **[RETURN]** until prompted for the user name.

2. **ENTER** user name and password: ☐ **RED** and CECC or ☐ **FRED** and CECC

3. **FOLLOW** computer prompts to begin or exit program.

NOTE: TYPE CTRL Z any time to exit or re-start program.

When executing the RED code you will be asked whether this is a "new run." **ANSWER** "Y" and **ENTER** "NEW RUN," unless you desire to modify or append to a current run.

4. **INPUT** data as collected on Appendix C.

For a user-specified release (for noble gas and/or tritium releases only), **ENTER** the nuclide number below (as applicable) and the associated nuclide-specific release rates.

Nuclide #	Nuclide	Nuclide #	Nuclide
1	H-3	28	XE-131M
6	KR-85	29	XE-133
7	KR-85M	30	XE-133M
8	KR-87	31	XE-135
9	KR-88	32	XE-138

5. **CONFIRM** whether the release rate data is correct, (Y/N). Edit as necessary.

6 **CONFIRM** whether the calculated release rate data is correct, (Y/N). Edit as necessary.

7. **RUN the code** for the expected event duration:

- For FRED Preliminary Assessments use 1 hour;
- For FRED Dose Projections use a 4-hour duration unless known otherwise.
- For RED assessments run once per 15-min during ongoing releases.

8. **OBTAIN** code outputs by as follows:

   a. **ANSWER** "Y" to the prompt to "Print dose charts or plume plots."
   b. **SELECT** State Update Form (SUF) and plume plot as minimum outputs
   c. **SELECT** scale to be used:
      [1] for 10 mile, **[2]** for 50 mile, **[3]** to exit code or go to next time segment)
   d. For plume plot, **CLICK** print button at bottom of screen to perform a screen print of plot. Be sure that the pop-up dialog box has the Graphic Image set to "Swap Black/White."
   e. For Preliminary Assessments, **OBTAIN** the Protective Action Guide (PAG) release rates from the FRED output and the actual/projected release rates from the State Update Form.

*<u>NOTE</u>	If the PAG values calculated by FRED are zero (due to either low wind speed or negligible release rate) perform the PAG release rate calculations manually using Appendix F sections A and B.

   f. The Preparer and Verifier shall **INITIAL and DATE** the results.

9. **COMPARE** the declared REP class with that indicated in the FRED output. Notify the RAC/RAM (to advise the TSC) of the need for REP class changes based on radiological conditions.

10. **GIVE** PAG and actual/projected release rates to the Board Writer.

11. **GIVE** the FRED results (SUF, PAG Release Rates, plume plot, and REP class information) to the RAC for distribution. (The SUF may be sent directly through the computer to the State and the TSC.)

12. At the request of the RAC/RAM, **PREPARE** a PAR using the CECC Protective Action Logic Diagram and the PAR form found in EPIP-7 and give to the RAM with the results of the FRED run.

13. **REQUEST** that the RAC distribute the SUF, and any plume plots to all standard distribution locations, via CECC Clerical instructions.

14. Preferably once every 15-min (at least once per hour) during an actual release,

   a. **ENTER** the release data into the RED code for use in tracking the plume
   b. **COMPARE** the estimated impacts to measured field data.
   c. **GIVE** the results (plume plot only) to the RAC for distribution to the CECC, the State, and the TSC.

15. **TYPE** CTRL Z any time to exit or re-start program.

*Revision

Appendix E Page 1 of 2

BRED Evaluation of Airborne Field Data

BRED Code Run

1. Log on to BRED. **DOUBLE CLICK** on the "CECC VAX" icon. PRESS return until prompted for username. ENTER username (BRED) and password (CECC).

2. **OBTAIN** the following field data from Environs Assessment.

   NOTE: As a minimum, only need one of the following measurements:
   Dose Rate **OR** Iodine-131 **OR** Tritium (H-3)

Distance (miles)	Direction (sector)	Time Taken	Dose Rate mrem/hr (1 meter w/c)

Iodine-131 µCi/cc	^{3}H Concentration µCi/cc

3. **Elapsed Time from reactor shutdown to time of field measurement:** _____ (hours) (enter 0 if Rx under power)

4. **DETERMINE the Release Path:**

SQN/WBN

- ☐ **Filtered** via containment (CTM)
- ☐ **Unfiltered** via containment (CTM)
- ☐ SGTR with rupture located **BELOW** water level
- ☐ Steam Generator Tube Rupture with rupture located **ABOVE** water level
- ☐ Turbine Bldg
- ☐ Reactor Bldg
- ☐ Auxiliary Bldg.

BFN

- ☐ Stack (filtered)
- ☐ Stack (unfiltered)
- ☐ Turbine Bldg, Reactor Bldg
- ☐ Main Steam Line Break (MSLB)

5. **DETERMINE the Release Type:** ☐RCS ☐Gap *(default)* ☐Core Damage ☐Fuel Melt

NOTE: Initially, a GAP Release Type should be used unless otherwise specified by the Core Damage Assessment team. Alternately, particulate-to-I^{131} field team air concentration data can be used as follows:

Field Team Data Particulate microCi/cc / Field Team Data Iodine^{131} microCi/cc = Ratio

	Gap	*Core Damage*	*Fuel Melt*
Ratio = Release Type:	≥ 0.18	≥ 2.0	≥ 3.5

BRED Code Run

BRED Evaluation of Airborne Field Data

6. **RUN** the BRED computer model and follow prompts using the information from sections 2-5. **TYPE** CTRL Z any time to exit or re-start program.

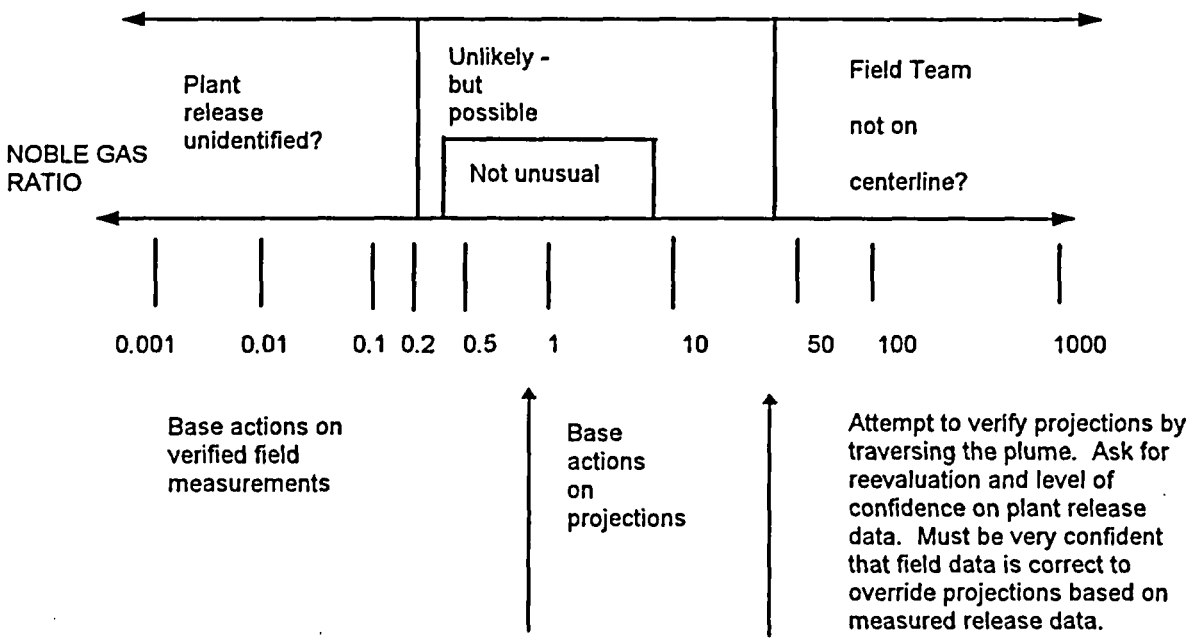
7. **RECORD** the printed Release Rate output (as applicable) and **INPUT into the FRED code.**

Noble Gas (μCi/s)	Iodine 131 (pre-treatment) μCi/s	Tritium (^{3}H) μCi/s

8. **COMPARE** the new FRED run dose rate output to the previous RED/FRED computer model by **CALCULATING** a data ratio as follows:

FRED or RED Centerline Dose Rate ***divided by*** the FIELD DATA Centerline Dose Rate

_____ divided by _____ = _____ RATIO



9. **PROVIDE** feedback to the Environs Assessor and RAC/RAM. **UPDATE** dose projections as necessary and give the results to the RAC for use in preparing Protective Action Recommendations (PAR), or prepare a PAR in accordance with CECC EPIP-1.

Appendix F Page 1 of 8

Manual Method for Assessing Airborne Releases

MANUAL AIR SB TEDE PAG

A. Calculating TEDE PAG Release Rate at SITE BOUNDARY (0.62 miles)

1. **DETERMINE:** Plant: ☐ BFN ☐ SQN ☐ WBN

Wind Speed: _____ (m/s)

Stability Class: (circle) A B C D E F G

Release Type: ☐RCS ☐Core Damage ☐User Specified
☐Gap *(default)* ☐Fuel Melt (for noble gas and Tritium only)

Release Path:

SQN/WBN	BFN
☐ Filtered via CTM	☐ filtered via stack
☐ Unfiltered via CTM	☐ unfiltered via stack
☐ SGTR with rupture **BELOW** water	☐ Turbine, Reactor Bldg
☐ SGTR with rupture **ABOVE** water	☐ Main Steam Line Break
☐ Turbine, Reactor, Auxiliary Building	

2. **CIRCLE** the **TEDE PAG FACTOR** (μCi/m) below, based on the stability class and release level.

NOTE: USE ground level for all cases except for BFN stack.

	A	B	C	D	E	F	G
Ground	1.7E+09	4.8E+08	2.2E+08	1.1E+08	7.4E+07	4.9E+07	2.9E+07
Stack	1.8E+09	9.1E+08	9.1E+08	8.3E+08	8.3E+08	8.0E+08	9.1E+08

3. **CIRCLE** the appropriate **TEDE Ratio** below, based on release type/path:

TEDE Ratio (for 0.62 mi)	BWR RCS	PWR RCS	Gap	Core Damage	Fuel Melt	User Spec
Stack (unfiltered	2.0	N/A	1.8	1.3	2.0	1.0
Stack (filtered)	1.9	N/A	1.0	1.0	1.0	1.0
CTM (unfiltered) or SGTR (below)	N/A	7.4	9.0	5.3	11	1.0
CTM (filtered)	N/A	3.7	1.0	0.9	1.0	1.0
SGTR (above water)	N/A	95	221	111	263	1.0
MSLB (BFN)	7.4	N/A	84	44	100	1.0
Turbine, Reactor or Aux Bldg	4.4	17	32	16	37	1.0

4. **CALCULATE** the **TEDE PAG Release Rate** (0.62 mi) as follows:

_____ (TEDE PAG FACTOR (μCi/m, item 2)) X _____ (wind speed (m/s, item 1)) / _____ (TEDE Ratio (item 3)) = _____ (TEDE NGPAG Release Rate SB 0.62 mi (μCi/s))

5. **OBTAIN** the actual/projected Noble Gas Release Rate _____ µCi/s.

6. **IF** noble gas release rate (item 5) ≥ TEDE PAG Release Rate (item 4), **THEN** radiological conditions indicate a **General Emergency.**

For Tritium Accidents (e.g., TPBAR handling or WGDT rupture),

7. **CIRCLE** the **Tritium PAG FACTOR** (µCi/m) below, based on the stability class.

A	B	C	D	E	F	G
4.0E+09	8.7E+08	2.9E+08	1.0E+08	5.9E+07	3.1E+07	1.4E+07

8. **CALCULATE** the **Tritium PAG Release Rate** as follows:

$$\frac{\text{Tritium PAG FACTOR}}{(\mu Ci/m,\ \text{item 7})} \times \frac{\text{wind speed}}{(\text{m/s item 1})} = \boxed{\frac{\text{TEDE Tritium PAG Release Rate}}{\text{SB 0.62 MI (}\mu Ci/s)}}$$

9. **OBTAIN** the actual/projected Tritium Release Rate (see below) _____ µCi/s.

NOTE:
- For a TPBAR handling accident, the H-3 release can be estimated as:

  H-3 Release Rate _____ = _____ µCi/cc H-3 x _____ cfm x 28320 cc/cf / 60 min/sec

  { H-3 release (µCi/s) = #µCi/cc H-3 x building exhaust flow rate (cfm) x 28320 cc/cf x 1/60 min/s }

- For a WGDT Rupture accident, the default H-3 release is 2500 Ci over one hr or 6.94E+05 µCi/s for 1 hr

10. **IF** tritium release rate (item 9) ≥ TEDE PAG Release Rate (item 8), **THEN** radiological conditions indicate a **General Emergency.**

11. **IF tritium accident also involves noble gases, THEN perform the following calculation:**

$$\frac{\text{NG Release Rate}}{\text{TEDE NG PAG Release Rate}} + \frac{\text{Tritium Release Rate}}{\text{TEDE Tritium PAG Release Rate}}$$

$$\frac{\text{(item 5)}}{\text{(item 4)}} + \frac{\text{(item 9)}}{\text{(item 8)}} = \frac{\quad}{\text{Ratio}}$$

12. **IF the value in item 11 ≥ 1.0, THEN** radiological conditions indicate a **General Emergency.**

B. Calculating THYROID CDE PAG Release Rate at SITE BOUNDARY (0.62 MILES)

1. **USE** the data from section A.1

2. **CIRCLE** the **CDE PAG FACTOR** (μCi/m), based on the stability class and release level.

   NOTE: USE ground level for all cases except for BFN stack.

	A	B	C	D	E	F	G
Ground	4.1E+05	8.6E+04	3.0E+04	1.0E+04	6.0E+03	3.1E+03	1.4E+03
Stack	4.1E+05	2.3E+05	3.7E+05	6.5E+05	1.4E+06	2.1E+07	4.9E+11

3. **CALCULATE** the CDE PAG Release Rate as follows:

_____	X	_____	=	_____
CDE PAG FACTOR (μCi/m, item 2)		wind speed (m/s)		**CDE PAG Release Rate** SB 0.62 mi (μCi/s)

4. a. If known, **RECORD** the actual/projected I-131 release rate _____ μCi/s and **go to Step 5.**

   If unknown, **CIRCLE** the I-131 to NG ratio below, based on release type and path and continue with step 4 b.

I-131 to Noble Gas Ratio				
	RCS	Gap	Core Damage	Fuel Melt
CTM filtered	1.7E-06	3.0E-05	1.2E-05	2.2E-05
Stack filtered	4.6E-07	3.0E-05	1.2E-05	2.2E-05
CTM (unfiltered) or SGTR (below)	1.7E-04	3.0E-03	1.2E-03	2.2E-03
Stack (unfiltered)	4.6E-05	3.0E-03	1.2E-03	2.2E-03
TB, AuxB, RxB	5.8E-04	1.0E-02	4.1E-03	7.7E-03
SGTR (above)	4.2E-03	8.0E-02	3.0E-02	5.5E-02
MSLB (BFN)	4.6E-04	3.0E-02	1.2E-02	2.2E-02

4.b. **CALCULATE** actual/projected iodine-131 release rate as follows:

_____	X	_____	=	_____
Actual/Projected NG release rate (item A.5)		I-131 to NG ratio (item 4a)		Actual/proj. I-131 release rate (μCi/s)

5. **IF** I-131 release rate (item 4a or b) ≥ CDE PAG Release Rate (item 3), **THEN** radiological conditions indicate a **General Emergency.**

MANUAL AIR SB TEDE RATE

C. Calculating TEDE Dose Rate at SITE BOUNDARY (0.62 miles)

1. **DETERMINE:** **Plant:** ☐ BFN ☐ SQN ☐ WBN

Wind Speed: _____ (m/s)

Stability Class: (circle) A B C D E F G

Release Type: ☐RCS ☐Core Damage ☐User Specified (for noble gas and Tritum only)
☐Gap *(default)* ☐Fuel Melt

Release Path: SQN/WBN BFN

☐ **Filtered** via CTM
☐ **Unfiltered** via CTM
☐ SGTR with rupture **BELOW** water
☐ SGTR with rupture **ABOVE** water
☐ Turbine, Reactor, Auxiliary Building
☐ filtered via stack
☐ unfiltered via stack
☐ Turbine, Reactor Bldg
☐ Main Steam Line Break

Noble Gas Release Rate : _____ (μCi/s)

2. **CIRCLE** the **TEDE FACTOR** (rem/h per μCi/m) below, based on the stability class and release level.

NOTE: USE ground level for all cases except for BFN stack.

	A	B	C	D	E	F	G
Ground	6.0E-10	2.1E-09	4.6E-09	9.5E-09	1.4E-08	2.1E-08	3.5E-08
Stack	5.5E-10	1.1E-09	1.1E-09	1.2E-09	1.2E-09	1.3E-09	1.1E-09

3. **CIRCLE** the appropriate TEDE Ratio below, based on release type/path:

	TEDE Ratio (at 0.62 mi)					
	BWR RCS	**PWR RCS**	**GAP**	**Core Damage**	**Fuel Melt**	**User Spec**
Stack (unfiltered)	2.0	N/A	1.8	1.3	2.0	1.0
Stack (filtered)	1.9	N/A	1.0	1.0	1.0	1.0
CTM (unfiltered) or SGTR (below)	N/A	7.4	9	5.3	11	1.0
CTM (filtered)	N/A	3.7	1.0	0.9	1.0	1.0
SGTR (above water)	N/A	95	221	111	263	1.0
MSLB (BFN)	7.4	N/A	84	44	100	1.0
TB, RxB, AB	4.4	17	32	16	37	1.0

4. **CALCULATE** the **TEDE Dose** as follows:

_____ X _____ X _____ / _____ = _____

NG release rate (μCi/s) (item A-5) | TEDE FACTOR (item 2) | TEDE Ratio (item 3) | wind sp. (m/s) (item 1) | **TEDE (rem/h) 0.62 mile**

For Tritium Accidents (e.g., TPBAR handling or WGDT rupture),

5. **CIRCLE** the **Tritium TEDE FACTOR** (rem/h per μCi/m) below, based on the stability class.

A	B	C	D	E	F	G
2.5E-10	1.2E-09	3.5E-09	1.0E-08	1.7E-08	3.3E-08	7.0E-08

MANUAL AIR
5 mi TEDE RATE
5 mi THY CDE RATE

6. **CALCULATE** the **Tritium TEDE** as follows:

Tritium Release Rate* (µCi/s)	X	Tritium TEDE FACTOR (item 5)	/	wind speed (m/s) (item 1)	=	Tritium TEDE (rem/h)

NOTE:
- For a TPBAR handling accident, the H-3 release can be estimated as:

$$\text{H-3 Release Rate} = \frac{\mu\text{Ci/cc H-3} \times \text{cfm} \times 28320\ \text{cc/cf}}{60\ \text{min/sec}}$$

{ H-3 release (µCi/s) = #µCi/cc H-3 x building exhaust flow rate (cfm) x 28320 cc/cf x 1/60 min/s }

- For a WGDT Rupture accident, the default H-3 release is 2500 Ci over one hr or 6.94E+05 µCi/s for 1 hr

7. **IF tritium accident also involves noble gases, THEN CALCULATE Total TEDE rate as follows:**

TEDE (rem/h)	+	Tritium TEDE (rem/h)	=	**Total TEDE (rem/h) 0.62 mile**

D. Calculating SB THYROID CDE Dose Rate

1. **CIRCLE** the Thyroid **CDE FACTOR** (rem/h per µCi/m), based on the stability class and release level.

NOTE: USE ground level for all cases except for BFN stack.

	A	B	C	D	E	F	G
Ground	1.2E-05	5.8E-05	1.7E-04	4.8E-04	8.3E-04	1.6E-03	3.5E-03
Stack	1.2E-05	2.2E-05	1.4E-05	7.7E-06	3.5E-06	2.3E-07	1.0E-11

2 a. If known, **RECORD** the I-131 release rate _____ µCi/s and **go to Step 3.**

If unknown, **CIRCLE** the I-131 to NG ratio below, based on release type and path and continue with step 2b.

I-131 to Noble Gas Ratio

	RCS	Gap	Core Damage	Fuel Melt
CTM filtered	1.7E-06	3.0E-05	1.2E-05	2.2E-05
Stack filtered	4.6E-07	3.0E-05	1.2E-05	2.2E-05
CTM (unfiltered) or SGTR (below)	1.7E-04	3.0E-03	1.2E-03	2.2E-03
Stack (unfiltered)	4.6E-05	3.0E-03	1.2E-03	2.2E-03
TB, AuxB, RxB	5.8E-04	1.0E-02	4.1E-03	7.7E-03
SGTR (above)	4.2E-03	8.0E-02	3.0E-02	5.5E-02
MSLB (BFN)	4.6E-04	3.0E-02	1.2E-02	2.2E-02

2b. **CALCULATE** actual/projected iodine-131 release rate as follows:

NG release rate (item A.5)	X	I-131 to NG ratio (item 2a)	=	I-131 release rate (µCi/s)

MANUAL AIR
5 mi TEDE
DOSE

3. **CALCULATE** Thyroid CDE Dose Rate as follows:

I-131 release rate (µCi/s) (item 2)	X	Thyroid CDE FACTOR (item 1)	/	wind speed (m/s)	=	Thyroid CDE (rem/h) 0.62 mile
_____		_____		_____		_____

E. Calculating 5 mile TEDE

USE the data from section A.1, **THEN**

1. **OBTAIN** an estimate of the release duration (t) _____ hours. Use 4 (four) hours unless known otherwise.

2. **CIRCLE** the **TEDE FACTOR** (rem/h per per µCi/m) below, based on the stability class and release level.

   NOTE: USE ground level for all cases except for BFN stack.

	A	B	C	D	E	F	G
Ground	9.5E-11	1.5E-10	2.8E-10	9.5E-10	1.8E-09	3.5E-09	6.5E-09
Stack	9.0E-11	1.5E-10	2.6E-10	7.5E-10	1.1E-09	1.3E-09	1.1E-09

3. **CIRCLE** the appropriate TEDE Ratio below, based on release type/path:

	TEDE Ratio (at 5 mi)					
	BWR RCS	PWR RCS	GAP	Core Damage	Fuel Melt	User Spec
Stack (unfiltered)	2.1	N/A	2.8	1.9	3.1	1.0
Stack (filtered)	2.1	N/A	1.0	0.9	1.0	1.0
CTM (unfiltered) or SGTR (below)	N/A	3.5	4.9	2.9	5.8	1.0
CTM (filtered)	N/A	1.8	1.0	1.0	1.0	1.0
SGTR (above water)	N/A	43	100	51	116	1.0
MSLB (BFN)	4.5	N/A	40	21	47	1.0
TB, RxB, AB	3.1	7.4	15	7.9	17	1.0

4. **CALCULATE** the **TEDE Dose** as follows:

NG release rate (µCi/s) (item A.5)	X	TEDE FACTOR (item 2)	X	TEDE Ratio (item 3)	X	Duration (hrs) (item 1)	/	wind sp. (m/s) (item 1)	=	TEDE (rem) 5 mile
_____		_____		_____		_____		_____		_____

For Tritium Accidents (e.g., TPBAR handling or WGDT rupture),

5. **CIRCLE** the **Tritium TEDE FACTOR** (rem/h per µCi/m) below, based on the stability class.

A	B	C	D	E	F	G
4.0E-11	5.0E-11	1.1E-10	4.4E-10	9.5E-10	2.4E-09	5.5E-09

6. **CALCULATE** the **Tritium TEDE** as follows:

_____	X	_____	X	_____	/	_____	=	_____
Tritium Release Rate (µCi/s)		Tritium TEDE FACTOR (item 5)		Duration (hrs) (item A.1)		wind speed (m/s) (item A.1)		Tritium TEDE (rem)

NOTE:
- For a TPBAR handling accident, the H-3 release can be estimated as:

$$\text{H-3 Release Rate} = \frac{\mu Ci/cc\ H\text{-}3 \times cfm \times 28320\ cc/cf}{60\ min/sec}$$

{ H-3 release (µCi/s) = #µCi/cc H-3 x building exhaust flow rate (cfm) x 28320 cc/cf x 1/60 min/s }

- For a WGDT Rupture accident, the default H-3 release is 2500 Ci over one hr or 6.94E+05 µCi/s for 1 hr

7) **IF tritium accident also involves noble gases, THEN CALCULATE Total TEDE as follows:**

_____	+	_____	=	_____
TEDE (rem)		Tritium TEDE (rem)		**Total TEDE (rem) 5 mile**

F. Calculating 5 mi THYROID CDE Doses

1. **CIRCLE** the Thyroid **CDE FACTOR** (rem/h per µCi/m), based on the stability class and release level.

   NOTE: USE ground level for all cases except for BFN stack.

	A	B	C	D	E	F	G
Ground	2.0E-06	2.5E-06	5.0E-06	2.2E-05	4.7E-05	1.2E-04	2.7E-04
Stack	2.0E-06	2.5E-06	4.5E-06	7.7E-06	3.5E-06	2.3E-07	1.0E-11

2. **OBTAIN** the I-131 release rate from B.4 _____ (µCi/s).

3. **CALCULATE** Thyroid CDE Dose as follows:

_____	X	_____	X	_____	/	_____	=	_____
I-131 release rate (µCi/s) (item 2)		Thyroid CDE FACTOR (item 1)		duration (hrs) (item C.1)		wind speed (m/s) (item A.1)		**Thyroid CDE (rem) 5 mile**

G. Summary of Results

Site Boundary TEDE Rates

1. Total TEDE Rate (item C.7) _____ rem/h

2. Circle REP Emergency class based on TEDE rate above:

For 0.62 mi TEDE dose rate ≥	REP Emergency Class
1E-04 rem/h	NOUE
1E-02 rem/h	ALERT
1E-01 rem/h	SAE
1E+00 rem/h	GE

Site Boundary Thyroid CDE Dose Rate

3. CDE Dose Rate (section D.3) _____ rem/h

4. Circle REP Emergency class based on CDE rate above:

For 0.62 mi CDE dose rate ≥	REP Emergency Class
NA	---
NA	---
0.5 rem/h	SAE
5 rem/h	GE

5 Mile TEDE

5. TEDE without Tritium (section E.4) _____ rem.

6. Total TEDE with Tritium (section E.7) _____ rem.

5 Mile Thyroid CDE

7. Thyroid CDE (section F.3) _____ rem.

Emergency Class

8. Circle the most restrictive REP class from items 2 and 4: NOUE Alert SAE GE

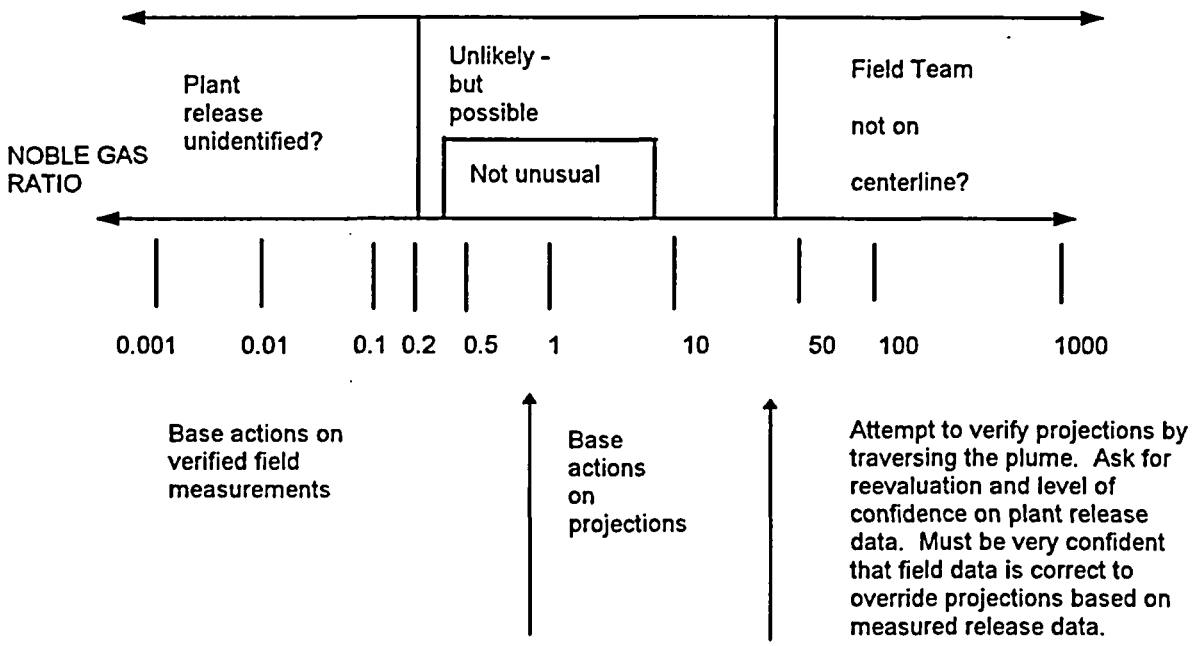
END OF MANUAL ASSESSMENT DATA VERIFICATION

Calculated by: (initial / date) _____/_____

Verified by: (initial / date) _____/_____

APPENDIX G
COMPARISON OF MEASURED FIELD DATA TO DOSE PROJECTION MODELS

$$\text{Ratio} = \frac{\text{PROJECTED centerline dose rate}}{\text{MEASURED centerline dose rate}}$$



APPENDIX H
WATERDOSE Evaluation of Liquid Release to the River

WATERDOSE Code Run

1. Log on to WATERDOSE. DOUBLE CLICK on the "CECC VAX" icon. PRESS return until prompted for username. ENTER username (WATERDOSE) and password (CECC).

2. OBTAIN the following information for input to WATERDOSE and FOLLOW code prompts.

NOTE: TYPE CTRL Z any time to exit or re-start program.

Plant: ☐ BFN ☐ SQN ☐ WBN

a. **Determine Release Point::** ☐ Diffuser ☐ Shoreline

b. **Length of release:** _____ Hours

c. **Volume of release:** _____ (ft^3)

d. **Release Mix (nuclides and concentrations)**

Nuclide	Concentration (μCi/ml)

3. RUN the WATERDOSE code using the available (or default below) information to obtain an estimate of the dose impact. (If the computer code is not operational, the dose calculation methodology contained in Appendix I can be used.)
BFN-33000 cfs **SQN - 29000 cfs** ***WBN - 27000 cfs**

NOTE: TYPE CTRL Z any time to exit or re-start program.

4. OBTAIN the State Update Form (SUF). The Preparer and Verifier shall **initial and date** the results.

5. TRANSMIT (by spooling through the computer) the SUF to the TSC and State if approval to do so has been given by the RAC/RAM.

6. TYPE CTRL Z any time to exit or re-start program.

*Revision

APPENDIX I Page 1 of 5

Manual Evaluation of Liquid Releases to the River

MANUAL RIVER

1. **Plant:** ☐ BFN ☐ SQN ☐ WBN

2. **Release Point:** ☐Diffuser ☐Shoreline

3. **Release Time:** Start _____ End _____ ☐Eastern ☐Central

4. **Release Volume (V)** _____ ft^3 (1 gal = 0.134 ft^3)

5. **Calculation of Hazard Index (HI):**

Nuclide	Concentration (µCi/ml)	Dose (rem/day per µCi/ml)	Hazard Index (rem/day)
	C	**DF- Table 3**	**HI=C * DF**
		Total Hazard Index	

6. **Riverflow at the plant** _____ ft^3/s (cfs). This can be obtained from the ICS (for SQN and WBN) or River Operations. If flow data is not available use the following default values:
BFN-33000 cfs SQN - 29000 cfs *WBN - 27000 cfs

7. **Calculate** the downstream dose rate to hypothetical individual **at first downstream** Public Water Supply and then other locations of interest. Refer to Appendix J.

	(table 2)	(table 1)	(item 5)	(item 4)	
Location TRM	Arrival Time Hours	Dilution Factor ($1/ft^3$) **D**	Hazard Index (rem/day) **HI**	Release Volume (ft^3) **V**	Dose Rate (rem/day) **D*H*V**

8. **Record** the applicable data on the State Update Form in CECC EPIP-1 and distribute.

Comments: _____

_____

END OF MANUAL ASSESSMENT	Calculated by: (initial / date)	_____/_____
DATA VERIFICATION	Calculated by: (initial / date)	_____/_____

*Revision

APPENDIX I Page 2 of 5

Manual Evaluation of Liquid Releases to the River

TABLE 1 DILUTION FACTOR (D)

RELATIVE CONCENTRATION FACTORS-PER CUBIC FOOT RELEASED

BROWNS FERRY NUCLEAR PLANT

	SHORELINE RELEASE		DIFFUSER PIPE RELEASE	
Tennessee River Mile (TRM)	Plant Side Shoreline D	Opposite Shoreline D	Centerline D	Shoreline D
294.00 Plant				
293.00	2.8E-08	.00E+00	1.4E-08	.00E+00
292.00	1.4E-08	.00E+00	6.9E-09	.00E+00
291.00	9.2E-09	.00E+00	4.6E-09	1.2E-36
290.00	6.9E-09	.00E+00	3.4E-09	8.2E-30
289.00	5.5E-09	.00E+00	2.8E-09	1.0E-25
288.00	4.6E-09	.00E+00	2.3E-09	5.1E-23
287.00	3.9E-09	.00E+00	2.0E-09	4.3E-21
286.00	3.4E-09	.00E+00	1.7E-09	1.2E-19
285.00	3.1E-09	.00E+00	1.5E-09	1.5E-18
284.00	2.8E-09	1.8E-42	1.4E-09	1.2E-17
283.00	2.5E-09	1.8E-39	1.3E-09	6.2E-17
282.00	2.3E-09	5.8E-37	1.1E-09	2.4E-16
281.00	2.1E-09	7.4E-35	1.1E-09	7.7E-16
280.00	2.0E-09	4.8E-33	9.8E-10	2.1E-15
279.00	1.8E-09	1.8E-31	9.2E-10	4.8E-15
278.00	1.7E-09	4.1E-30	8.6E-10	1.0E-14
274.90 Downstream Dam				

SEQUOYAH NUCLEAR PLANT

	SHORELINE RELEASE		DIFFUSER PIPE RELEASE	
TRM	Plant Side Shoreline D	Opposite Shoreline D	Centerline D	Shoreline D
484.50 Plant				
484.00	3.5E-08	5.9E-34	1.8E-08	1.1E-14
483.00	1.4E-08	5.3E-19	7.2E-09	3.0E-11
482.00	9.1E-09	3.2E-15	4.6E-09	1.9E-10
481.00	6.6E-09	1.5E-13	3.3E-09	3.9E-10
480.00	5.2E-09	1.4E-12	2.6E-09	5.6E-10
479.00	4.3E-09	5.4E-12	2.2E-09	6.8E-10
478.00	3.7E-09	1.4E-11	1.8E-09	7.6E-10
477.00	3.2E-09	2.7E-11	1.6E-09	8.2E-10
476.00	2.8E-09	4.5E-11	1.4E-09	8.4E-10
475.00	2.5E-09	6.6E-11	1.3E-09	8.6E-10
474.00	2.3E-09	9.0E-11	1.2E-09	8.6E-10
473.00	2.1E-09	1.2E-10	1.1E-09	8.6E-10
472.00	1.9E-09	1.4E-10	1.0E-09	8.5E-10
471.00	1.8E-09	1.7E-10	9.8E-10	8.3E-10
471.00 Downstream Dam				

APPENDIX I Page 3 of 5

Manual Evaluation of Liquid Releases to the River

TABLE 1 DILUTION FACTOR (D)

RELATIVE CONCENTRATION FACTORS-PER CUBIC FOOT RELEASED

WATTS BAR NUCLEAR PLANT

	SHORELINE RELEASE		DIFFUSER PIPE RELEASE	
TRM	Plant Side Shoreline D	Opposite Shoreline D	Centerline D	Shoreline D
528.00 Plant				
527.00	3.7E-08	1.2E-20	1.8E-08	2.3E-11
526.00	1.8E-08	1.5E-14	9.1E-09	4.1E-09
525.00	1.2E-08	1.3E-12	6.1E-09	1.0E-09
524.00	9.1E-09	1.2E-11	4.6E-09	1.4E-09
523.00	7.3E-09	4.0E-11	3.7E-09	1.7E-09
522.00	6.1E-09	9.0E-11	3.1E-09	1.8E-09
521.00	5.2E-09	1.6E-10	2.7E-09	1.8E-09
520.00	4.6E-09	2.3E-10	2.4E-09	1.8E-09
519.00	4.1E-09	3.1E-10	2.2E-09	1.8E-09
518.00	3.7E-09	3.8E-10	2.0E-09	1.8E-09
517.00	3.3E-09	4.6E-10	1.9E-09	1.7E-09
516.00	3.0E-09	5.2E-10	1.8E-09	1.7E-09
515.00	2.8E-09	5.8E-10	1.7E-09	1.6E-09
514.00	2.6E-09	6.4E-10	1.6E-09	1.6E-09
513.00	2.4E-09	6.8E-10	1.6E-09	1.5E-09
512.00	2.3E-09	7.2E-10	1.5E-09	1.5E-09
511.00	2.2E-09	7.6E-10	1.5E-09	1.4E-09
510.00	2.0E-09	7.9E-10	1.4E-09	1.4E-09
510.00	1.9E-09	8.2E-10	1.4E-09	1.4E-09
508.00	1.8E-09	8.4E-10	1.3E-09	1.3E-09
507.00	1.8E-09	8.6E-10	1.3E-09	1.3E-09
506.00	1.7E-09	8.7E-10	1.3E-09	1.3E-09
505.00	1.6E-09	8.8E-10	1.2E-09	1.2E-09
504.00	1.5E-09	8.9E-10	1.2E-09	1.2E-09
503.00	1.5E-09	9.0E-10	1.2E-09	1.2E-09
502.00	1.4E-09	9.1E-10	1.2E-09	1.2E-09
501.00	1.4E-09	9.1E-10	1.1E-09	1.1E-09
500.00	1.3E-09	9.1E-10	1.1E-09	1.1E-09
471.00 Downstream Dam				

APPENDIX I Page 4 of 5

Manual Evaluation of Liquid Releases to the River

APPROXIMATE TRAVEL TIME TO MAXIMUM CONCENTRATION - HOURS

TABLE 2
ARRIVAL TIME
(HRS)

BROWNS FERRY NUCLEAR PLANT

TRM	RIVER FLOW IN CUBIC FEET/SECOND					
	25000	30000	33000	35000	37000	39000
294.00 Plant						
292.00	25	21	19	18	17	16
290.00	49	41	37	35	33	31
288.00	74	62	56	53	50	47
286.00	99	82	75	71	67	63
284.00	124	103	92	88	84	80
282.00	148	124	112	106	100	94
280.00	173	144	131	124	117	110
278.00	198	165	150	141	134	128
276.00	222	185	169	159	150	142
274.90 Downstream Dam						

SEQUOYAH NUCLEAR PLANT

	21000	25000	29000	30000	33000
484.50 Plant					
483.00	5	4	4	3	3
481.00	12	10	8	8	7
479.00	18	15	13	13	12
477.00	25	21	18	17	16
475.00	32	26	23	22	20
473.00	38	32	28	27	24
471.00	45	38	32	31	28
471.00 Downstream Dam					

WATTS BAR NUCLEAR PLANT

	19000	20000	25000	30000	35000
528.00 Plant					
526.00	5	4	3	3	3
524.00	10	9	7	6	6
522.00	15	14	11	9	9
520.00	20	19	15	12	12
518.00	25	24	19	16	15
516.00	30	29	23	19	18
514.00	35	33	27	22	21
512.00	40	38	30	25	24
510.00	45	43	34	29	28
508.00	50	48	38	32	31
506.00	56	53	42	35	34
504.00	61	58	46	38	37
502.00	66	62	50	41	40
500.00	71	67	54	45	43
471.00 Downstream Dam					

TABLE 3 DOSE FACTORS (DF)

APPENDIX I Page 5 of 5

Manual Evaluation of Liquid Releases to the River

Critical Ingestion Dose Rate Factors
(Derived from Regulatory Guide 1.109)
Rem/day per μCi/ml

Nuclide	Dose Factor	Organ[1]	Age[2]	Nuclide	Dose Factor	Organ[1]	Age[2]
H-3	0.28	TB	C	Ru-103	43.2	GIT	A
C-14	16.9	B	C	Ru-105	58.9	GIT	C
Na-24	8.12	TB	C	Ru-106	356	GIT	A
P-32	1155	B	C	Ag-110m	121	GIT	A
Cr-51	1.34	GIT	A	Te-125m	21.8	K	A
Mn-54	28	GIT	A	Te-127m	55	K	A
Mn-56	67.8	GIT	C	Te-127	25.8	GIT	C
Fe-55	16.1	B	C	Te-129m	96	K	C
Fe-59	68	GIT	A	Te-129	20.4	GIT	I
Co-58	30	GIT	A	Te-131	168	GIT	A
Co-60	80.4	GIT	A	Te-131	6.4	GIT	I
Ni-63	753	B	C	Te-132	154	GIT	A
Ni-65	35.8	GIT	C	I-130	1332	THY	I
Cu-64	14.2	GIT	A	I-131	12500	THY	I
Zn-65	51.1	L	C	I-132	142	THY	I
Zn-69	12.33	GIT	I	I-133	2980	THY	I
Br-83	0.24	TB	C	I-134	37.4	THY	I
Br-84	0.28	TB	C	I-135	584	THY	I
Br-85	0.013	TB	C	Cs-134	538	L	C
Rb-86	153	L	I	Cs-136	90.4	L	C
Rb-88	0.45	L	I	Cs-137	438	B	I
Rb-89	0.26	L	I	Cs-138	1.13	GIT	I
Sr-89	1850	B	C	Ba-139	50.2	GIT	I
Sr-90	23800	B	C	Ba-140	116	B	C
Sr-91	74.2	GIT	C	Ba-141	7.27	GIT	I
Sr-92	239	GIT	C	Ba-142	1.06	GIT	I
Y-90	204	GIT	A	La-140	185	GIT	A
Y-91m	2.43	GIT	I	La-142	46.3	GIT	C
Y-91	155	GIT	A	Ce-141	48.4	GIT	A
Y-92	146	GIT	C	Ce-143	91.2	GIT	A
Y-93	238	GIT	C	Ce-144	330	GIT	A
Zr-95	61.8	GIT	A	Pr-143	80.6	GIT	A
Zr-97	210	GIT	A	Pr-144	4.44	GIT	I
Nb-95	42	GIT	A	Nd-147	69.8	GIT	A
Mo-99	39.8	K	C	W-187	56.4	GIT	A
Tc-99m	1.44	GIT	C	Np-239	48	GIT	A

1. THY = thyroid, GIT = Gastrointestinal Tract, K = Kidney, L = Liver, TB = Total Body, B = Bone

2. A = Adult, C = Child, I = Infant

APPENDIX J Page 1 of 3

BFN - PUBLIC AND INDUSTRIAL SURFACE WATER SUPPLIES

County-State	Plant Name	Water Source	Type of Water Supply	Notification Advise State or Local Authorities listed in the REND
10-Mile Radius				
Limestone-Alabama	Browns Ferry Nuclear Plant	Tennessee River	Industrial	
Lawrence-Alabama	W. Morgan, E. Lawrence Water Authority	Tennessee River	Municipal	
Lawrence-Alabama	Champion International (Courtland Plant)	Tennessee River	Industrial & Potable	
25-Mile Radius				
State of Alabama	Joe Wheeler State Park	Tennessee River	Municipal	
Lawrence-Alabama	TVA-Wheeler Dam[1]	Tennessee River	Industrial	
50-Mile Radius				
Lauderdale-Alabama	Florence City-Wilson Plant	Tennessee River	Municipal	
Colbert-Alabama	Reynolds Metals Company	Tennessee River	Industrial	
Colbert-Alabama	Muscle Shoals	Tennessee River Fleet Hollow Embayment	Municipal	
Colbert-Alabama	TVA ERL	Fleet Hollow Embayment	Industrial & Potable	
Colbert-Alabama	TVA-Wilson Dam	Tennessee River	Industrial	
Colbert-Alabama	Occidental Chemical Company	Tennessee River	Industrial	
Colbert-Alabama	Sheffield	Tennessee River	Municipal	
Colbert-Alabama	Sheffield Police			
Colbert-Alabama	TVA Colbert Fossil Plant	Tennessee River	Industrial	
Colbert-Alabama	Cherokee Water Works & Gas	Tennessee River	Municipal	
Colbert-Alabama	Cherokee Police (Day)			
Colbert-Alabama	Cherokee Police (Night)			
Colbert-Alabama	Laroche Industries	Tennessee River	Industrial	

[1]Potable water obtained from East Lauderdale County Water District.

APPENDIX J Page 2 of 3

SQN - PUBLIC AND INDUSTRIAL SURFACE WATER SUPPLIES

County-State	Plant Name	Water Source	Type of Water Supply	Notification Advise State or Local Authorities listed in the REND
10-Mile Radius				
Hamilton-Tennessee	Sequoyah Nuclear Plant	Tennessee River	Industrial	
	Gold Point Marina	Tennessee River		
	East Side Utility	Tennessee River	Industrial	
		Tennessee River	Industrial	
	Chickamauga Dam (Power Service Center)	Tennessee River	Industrial	
	Chickamauga Dam	Tennessee River		
25-Mile Radius				
	E. I. Dupont Co.	Tennessee River	Industrial and Potable	
	Tennessee American Water Co.	Tennessee River	Municipal	
	Rock-Tennessee Mill[1]	Tennessee River	Industrial	
	Vulcan Sand & Gravel[1]	Tennessee River	Industrial	
	Signal Mountain Cement[1]	Tennessee River	Industrial	
	Medusa Cement Co.	Tennessee River	Industrial	
50-Mile Radius	Signal Mountain Cement (Plant)	Tennessee River	Industrial	
Marion-Tennessee	Signal Mountain Cement (Quarry)	Tennessee River	Industrial	
	South Pittsburg	Tennessee River	Municipal	
	Nickajack Dam	Tennessee River	Industrial	
Jackson-Alabama	Bridgeport	Tennessee River and Spring	Municipal	
Jackson-Alabama	Bridgeport Police	Tennessee River and Spring		
	Widows Creek Fossil Plant[2]	Tennessee River	Industrial	
	Mead Corporation	Tennessee River	Industrial	

[1]Obtains potable water from Tennessee-American Water Company.
[2]Obtains potable water supply from Bridgeport - physically removed potable water intake in November 1986.

APPENDIX J Page 3 of 3

WBN - PUBLIC AND INDUSTRIAL SURFACE WATER SUPPLIES ON THE TENNESSEE RIVER

County-State	Plant Name	Water Source	Type of Water Supply	Notification Advise State or Local Authorities listed in the REND
10-Mile Radius				
Rhea-Tennessee	Watts Bar Fossil & Hydro Plant[1]	Tennessee River	Industrial[2,3]	
	Watts Bar Nuclear Plant	Tennessee River	*Industrial[3,4]	
25-Mile Radius				
Rhea-Tennessee	City of Dayton	Tennessee River	Municipal	
	Dayton Police			
50-Mile Radius				
Hamilton-Tennessee	TVA Sequoyah Nuclear Plant	Tennessee River	Industrial	
	East Side Utility	Tennessee River	Industrial	
	E. I. Dupont	Tennessee River	Industrial and Potable	
	Chickamauga Dam	Tennessee River	Industrial	
	Tennessee American Water Co.	Tennessee River	Municipal	
	Rock-Tennessee Mill[5]	Tennessee River	Industrial	
	Vulcan Sand and Gravel[5]	Tennessee River	Industrial	
	Signal Mountain Cement[5]	Tennessee River	Industrial	

[1]On layby status - water use when activated is about 445 MGD.
[2]Cooling water.
[3]Potable water to nuclear plant, steam plant, hydro plant, and resort area, provided through Watts Bar Reservation System (wells).
[4]Cooling water and cooling tower makeup.
[5]Obtains potable water supply from Tennessee-American Water Company.

CECC EPIP Coversheet

Tennessee Valley Authority CENTRAL EMERGENCY CONTROL CENTER EMERGENCY PLAN IMPLEMENTING PROCEDURES	Title RADIOACTIVE MATERIAL TRANSPORTATION INCIDENTS	CECC EPIP-23 REV. 19 Effective Date: 10/9/03

WRITTEN BY: Thomas E. Adkins REVIEWED BY: [signature] 8/7/2003
Signature *Signature* *Date*

PLAN EFFECTIVENESS DETERMINATION: Thomas E. Adkins 8/7/03
Signature *Date*

CONCURRENCES

Concurrence Signature	Date
☒ Manager, EP Program Planning and Implementation David Pond	8/8/03
☒ Manager, Emergency Preparedness David Pond for BK MARKS	8/8/03
☒ Manager, Radiological and Chemistry Services Chandran	10/07/03
☐	

APPROVAL

APPROVED BY: [signature] Engineering & Technical Services 10/7/03
Signature *Title* *Organization* *Date*

CECC-EPIP-23
RADIOACTIVE MATERIAL TRANSPORTATION INCIDENTS

REVISION LOG

Rev. No.	Date	Revised Pages
0	12/12/88	All
1	4/26/89	3
2	10/26/89	App. A
3	6/20/90	All (formerly EPIP-21) (Former EPIP-23 transferred to EPIP-13)
4	9/14/90	Pg. 4 (only)
5	5/21/91	Pages 1 - 19
6	02/22/93	Pgs. 1-17 revised. Pages 20-23 added. All pages issued.
7	11/30/93	Pages 3, 15, and 20; all pages issued.
8	06/23/94	Pgs. 5-7; All pages issued.
9	6/27/95	Pgs. 3-6, 11-15, 17, and 18
10	1/3/96	Procedure issued in new format which includes, in some cases, altering of the order of statements, editorial changes, and adding boxes and shading to highlight statements. Changed accident to incident in title and through the EPIP. Added definition of transportation incident, revised references section, updated EDO checklist. Added notification of the Senior Nuclear Executive and affected site VP to the CECC Dir. checklist, added WBN phone numbers, changed Appendices to Attachments. All pages issued.
11	5/30/96	Pgs. 2, 4, 6, 8, Att. E; Att. F; annual review, minor changes for clarification, revised to provide flexibility for selection of optional equipment needed by field teams; all pages issued.
12	4/7/97	Annual review, editorial and organizational updates. All pages issued.
13	5/8/97	Page 18 revised to support new air sampling equipment. All pages issued.
14	3/11/98	Annual review. Pages 2, 4; and 5 revised to add instructions to get equipment from plants and consideration for use of still camera and satellite phone, update Corporate Communications titles. Page 15 revised to remove full-face respirators w/HEPA-charcoal filters from equipment list. All pages issued.
15	7/7/98	Update Transportation Equipment list, pages 14 & 15. All pages issued.
16	6/15/00	Annual review. Editorial changes, update area codes, new packaging for KI, add flash lights to inventory list.
17	8/23/01	Update EDO checklist and SQN SM telephone number. All pages issued.

CECC-EPIP-23
RADIOACTIVE MATERIAL TRANSPORTATION INCIDENTS

REVISION LOG

Rev. No.	Date	Revised Pages
18	6/13/02	Annual review. Add references to REPTRACK, update telephone numbers, editorial changes. All pages issued.
19	10/09/03	Annual review. Add equipment inventory retention criteria, editorial changes. All pages issued.

RADIOACTIVE MATERIAL TRANSPORTATION INCIDENTS

1.0 PURPOSE

This procedure provides guidance to TVA personnel under the control of the CECC for response to transportation incidents involving radioactive materials. A transportation incident includes vehicle incidents, leaking containers, or other abnormal situations that could attract attention or require assistance.

2.0 SCOPE

This procedure is applicable to transportation incidents involving radioactive materials to which TVA is requested to respond, including those situations which do not include shipments involving TVA materials or facilities.

3.0 REFERENCES

3.1 "Carrier and Shipper Responsibilities and Emergency Response Procedures for Highway Transportation Accidents Involving Truckload Quantities of Radioactive Materials," ANSI N14.27, 1986.

3.2 "Emergency Response Guidebook," Department of Transportation.

4.0 RESPONSIBILITIES

4.1 CECC Director

Upon notification of a transportation incident, evaluate the need to staff the CECC and provide overall coordination of the response to the incident. Perform actions per **Attachment B** and review section 6.0.

NOTE: If an on scene responder requests immediate information concerning the shipment or how to respond to the incident, the information must be provided within 15 minutes from the time the call is received. Additional information is contained in **Attachment B** of this procedure.

4.2 CECC Emergency Preparedness Staff

4.2.1 The Manager, EP Program Planning and Implementation Section, or designee, ensures equipment and materials are available and maintained in accordance with section 5.0.

4.2.2 Upon notification, the EP Emergency Duty Officer (EDO) shall perform actions per **Attachment A.**

4.3 Radiological Assessment Manager (RAM)

Upon notification, perform actions per **Attachment C** and review section 6.0.

4.4 Environs Assessor (EA)

Upon activation, perform actions per Attachment D and review section 6.0.

4.5 Field Coordinator (FC)

Upon activation, perform actions per Attachment D and review section 6.0.

NOTE: The EA may assume the functions of the FC.

4.6 Monitoring Team

4.6.1 If using a site sampling team vehicle for response to the incident scene, the inventory per CECC EPIP-9 should be sufficient. Obtain additional dosimetry for any persons in addition to the standard 2-person sampling team crew.

If not using a sampling team vehicle for response to the incident scene, gather equipment per **Attachment E.** Consider Health Physics equipment needs applicable to the emergency and obtain those items from plant inventory (i.e., hand held and extended reach survey instruments, air samplers, and respirators).

4.6.2 Consider the need for video camera, still camera, and portable communications (radio, cellular phone or satellite phone).

4.6.3 Prior to arrival at the incident scene, review expected actions per **Attachment F** and review section 6.0.

4.6.4 Upon arrival at the incident scene, perform actions per **Attachment F** and CECC instructions. Utilize applicable CECC EPIP-9 instructions and data forms for radiological monitoring. Complete **Attachment G** as an incident area survey map.

4.7 Dose Assessment

Upon activation for a transportation incident response, perform actions per instructions of the Radiological Assessment Manager.

4.8 Corporate Communications

4.8.1 Upon notification of a transportation incident, the Nuclear Information Duty Officer shall inform the Site Communications Consultant or the Media Relations Duty Officer of the incident.

4.8.2 The Site Communications Consultant or Media Relations Duty Officer has the responsibility to establish contact with the CECC Director for coordination and to open a conduit to obtain information concerning the incident.

5.0 OPERATIONAL READINESS OF ENVIRONMENTAL MONITORING EQUIPMENT

5.1 Emergency Environmental Monitoring Vehicles

Emergency Preparedness has vehicles and equipment available for response to a transportation incident. Inspections, inventories, and locations are provided in CECC EPIP-9 and -23.

5.2 Transportation Incident Kit

5.2.1 A response kit for situations requiring the use of transportation other than the vehicles referenced in section 5.1, is located at the Central Emergency Control Center (CECC).

5.2.2 The contents of the kit are listed in **Attachment E**. As a minimum, inspections shall be performed by the assigned organization each calendar quarter or after use to ensure operational readiness is maintained.

* 5.2.3 Completed checklists shall receive a supervisory review prior to placement in the EP test file.

* 5.2.4 Inspection checklists shall be retained for a minimum period of three years.

6.0 GENERAL OPERATIONS FOR ENVIRONMENTAL MONITORING TEAMS

6.1 Radiological and Physical Hazard Precautions

6.1.1 Perform applicable radiological monitoring practices upon the approach to an incident area, during on-scene operations, and prior to leaving controlled areas.

6.1.2 Be attentive to potential changing conditions (i.e., onset of release due to fire, addition of runoff due to fire-prevention measures, movement of vehicle or container, deterioration of containers due to contact with spilled chemicals, or meteorological conditions).

6.1.3 Remain cognizant of individual doses and take action to limit doses ALARA, below individual routine exposure limits. Any decisions to embark on emergency operations which would result in exposures in excess of limits in 10 CFR 20 should be done in consultation with the CECC Radiological Assessment Manager.

6.1.4 Assume airborne radioactivity exists until there is direct evidence to the contrary and use appropriate respiratory protection equipment, based on known or suspected airborne hazards.

CAUTION!:	**Because some shipments may contain materials that present toxic hazards that exceed radiological hazards, the team shall not enter a plume from a fire. Shipments of radioiodines with significant activity are common for medical purposes. Consider the use of KI if airborne radioiodine is suspected (and actual levels are unknown) and exposure rates greater of 25 mrem/hr are encountered.**

*Revision

6.1.5 Shipments may also involve other hazardous materials (toxics, corrosives, flammables or reactives). Be attentive to contact with materials (either directly or from residues on radiological samples) and to the limitations of your personal protective clothing and equipment.

NOTE: Material information may be listed on shipping papers. Refer to the DOT Emergency Response Manual for specific protective action recommendations if placard or chemical ID information is known. Otherwise, team members shall observe radiological protective actions described in CECC EPIP-9 and as noted on the bottom of exposure rate and air activity data forms.

6.2 Communications for Environmental Monitoring Teams

6.2.1 If available, the Emergency Environs Monitoring radio is the primary means of communication if the incident location is within the system coverage.

6.2.2 If the radio system is not available, utilize best available alternate means (cellular or satellite telephone).

NOTE: Additional radio system information and CECC telephone numbers are provided in CECC EPIP-9.

6.3 Incident Scene Activities

The monitoring team shall follow instructions from the CECC and in accordance with **Attachment F.** Deviations from exact compliance may be necessary in consideration of specific circumstances of the incident; however, personnel safety shall not be compromised.

7.0 LIST OF ATTACHMENTS

Attachment A:	EP Emergency Duty Officer (EDO) Checklist
Attachment B:	CECC Director Checklist
Attachment C:	CECC RAM Checklist
Attachment D:	CECC Environs Assessor and Field Coordinator Checklist
Attachment E:	Transportation Incident Equipment
Attachment F:	Incident Scene Activities (Environmental Monitoring Team)
Attachment G:	Incident Area Survey Form
Attachment H:	On Scene Incident Report
Attachment I:	Fitness for Duty Program Administration - TVAN Call-In Sheet

Attachment A Page 1 of 1

EP Emergency Duty Officer Checklist

1. Perform the following notifications:

Time/Init.

_____/_____ Confirm the CECC Director has been notified by the Operations Duty Specialist.
Specialist (Name: _____ Number: _____)

_____/_____ Notify the Manager, EP Program Planning and Implementation Section or designee.

_____/_____ Notify the EP Program Manager responsible for EP emergency radiological monitoring equipment and vehicles or designee.

_____/_____ Notify the Manager, EP State and Local Programs Section or designee.

_____/_____ Notify the Nuclear Information Duty Officer.
(Name: _____ Number: _____)

2. Establish initial operation of the CECC if it is to be utilized.

3. Assist any response team members in obtaining EP equipment and vehicles.

NOTE: The transportation incident kit assigned to the CECC may be located in the CECC. If a vehicle is not currently available in Chattanooga, refer to EPIP-9, for other vehicle locations. A Portable radio, camera, film, and camcorders may also be available in the EP Staff storage area.

Radiological monitoring equipment, supplies, and Potassium Iodide tablets may also be available in the CECC area.

4. The issuance of a cellular or satellite phone to the CECC management team should be considered.

Attachment B Page 1 of 6

CECC DIRECTOR CHECKLIST

1. Obtain a completed:

   - "Transportation Incident Checklist" (CECC EPIP-22, Attachment A)
   - ODS Radioactive Material Shipment Notification form (from the Operations Duty Specialist if it was faxed by the shipper.)

NOTE: If an on scene responder requests immediate information concerning the shipment or how to respond to the incident, then **refer to pages 3, 4, 5, and 6 of this attachment**. Requested information shall be provided within 15 minutes from the time that it is initially requested.

2. Consult with the on duty CECC Radiological Assessment Manager and Nuclear Information Duty Officer to determine the necessary levels of staffing for the CECC. Inform the ODS to notify selected staff and utilize Attachment I, "Fitness for Duty Program Administration" for documentation.

3. If determined necessary, begin preparations to dispatch a CECC Management team from the CECC consisting of management representatives from Emergency Preparedness, Radiological Control, and Communications to the incident site.

4. Consult with the on duty CECC Radiological Assessment Manager and determine if an environmental monitoring team should be dispatched.

NOTE: The Radiological Assessment Manager is responsible for providing input, selecting response team members, and arranging transportation.

5. Consult with the on duty Radiological Assessment Manager and Nuclear Information Duty Officer to determine if the CECC Management Team should be released to proceed to the incident location.

6. Notify the Senior Nuclear Executive of the incident.

7. Notify the affected site Vice President of the incident

CECC DIRECTOR CHECKLIST

8. Notify the following: (These notifications may be delegated.)

NOTE: These notifications shall be made for all vehicle accident situations and are optional for other minor incidents as deemed appropriate.

Time/Init. **(Refer to the TVA REND)**

_____/_____ NRC Office of Inspection and Enforcement-Atlanta (consider notification of Rockville, Maryland if the incident is in a state outside of Region II) MRC reporting requirements in 10 CFR 2202 do not require an accident to be repaired.

* _____/_____ U.S. Department of Transportation. All accidents are not required to be reported to DOT, only those meeting 49 CFR 171.15)

_____/_____ State contact for incident location

_____/_____ Department of Energy (for information only)

_____/_____ American Nuclear Insurers (ANI)

* _____/_____ TVA Nuclear Insurance Carrier Contact (if requested by ANI)

* **(Refer to the current CECC Reptrack Roster.)**

* _____/_____ Nuclear Information Duty Officer (Reptrack Roster)

9. Evaluate the appropriate level of TVA resources to commit and provide overall coordination of those resources.

10. Ensure that Federal, State, and local agencies are kept informed, as appropriate, of TVA activities and coordinate TVA's efforts with those agencies.

11. Review with the Radiological Assessment Manager any on site and offsite consequences and assess the adequacy and need for measures for the protection of the public.

12. Make recommendations to State and local agencies on protective measures for the public.

13. Maintain accurate records of decisions made and actions started and completed.

*Revision

CECC DIRECTOR CHECKLIST

INFORMATION FOR ON SCENE RESPONDERS

14. Ensure Public Information needs are addressed.

15. Ensure appropriate recovery actions are taken.

NOTE: Information requested by authorities for immediate action **shall be provided within 15 minutes.**

Information About Shipments

a. If you are requested to provide information concerning the shipment, refer to the ODS RADIOACTIVE MATERIAL SHIPMENT FORM which was telecopied to the ODS when the shipment left the TVA facility. Provide any information on the form which may be requested by the on scene responder and tell this individual of any precautions that may be indicated on the form.

Information About Emergency Response

b. If you are requested to provide information concerning Emergency Response, then provide any pertinent information contained in **pages 4, 5 and 6 of this Attachment.**

Where To Get Assistance

c. If you are requested to provide information which you have no knowledge of or is not available to you, contact the Shift Manager or the RADCON Lab at the affected plant for assistance at the telephone numbers listed below. If the shipment does not originate at a nuclear plant, the Shift Manager or Site RADCON Staff at a TVA nuclear plant may be able to provide information concerning the radioactive material being shipped.

*	SQN SM	423-843-7860
*	SQN RADCON Lab	423-843-7865
*	BFN SM	256-729-7860
*	BFN RADCON Lab	256-729-7865
*	WBN SM	423-365-7860
*		
*	WBN RADCON Lab	423-365-7865
*		

If you are unable to contact the Shift Manager or RADCON Lab, then contact the *Radiological Assessment Manager listed on the CECC Reptrack Roster or one of the Radioactive Materials Specialists listed in the REND.

*Revision

Attachment B Page 4 of 6

CECC DIRECTOR CHECKLIST

INFORMATION FOR ON SCENE RESPONDERS

EMERGENCY RESPONSE INFORMATION

NOTE: A copy of this information is included with the shipping papers sent with the shipment.

Immediate Hazards to Health

a. External radiation from unshielded radioactive material.

b. Internal radiation from inhalation, ingestion, or skin absorption.

c. Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material.

d. Runoff from fire control or dilution water may cause the spread of radioactive contamination.

Risks of Fire and Explosion

a. The primary potential for fire or explosion is from leaking fuel from the motor vehicle.

b. Some of the packaged materials may burn, but none of them readily ignites.

c. Radioactive oil (if present in a package) has a potential for fire.

Immediate Precautions To Be Taken

a. Keep unnecessary people as far from the transport vehicle as practicable.

b. Notify State or local police that an incident has occurred involving radioactive material.

c. Isolate hazard area and deny entry.

d. Detain uninjured persons and equipment exposed to radioactive material until arrival or instruction of Radiation Authority.

e. Delay clean-up until arrival or instruction of the Radiological Authority with jurisdiction.

f. Do not move damaged containers.

CECC DIRECTOR CHECKLIST

INFORMATION FOR ON SCENE RESPONDERS

EMERGENCY RESPONSE INFORMATION

Immediate Methods of Handling Fires

a. Keep everyone at least 150 feet upwind and minimize breathing any of the smoke or fumes from the fire. Greater distances may be necessary if advised by Radiation Authority.

b. Notify the fire department of the fire and inform them that the transport vehicle is carrying radioactive material.

c. Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.

d. If advised by the Radiation Authority, move undamaged containers out of fire zone.

e. Small Fires: Dry chemical, CO2, Halon, water spray, or standard foam.

f. Large Fires: Water spray, fog (flooding amounts).

g. For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

h. Fight fire from maximum distance. Stay away from ends of tanks.

i. If water pollution occurs, notify the appropriate authorities.

Immediate Methods for Handling Spills or Leaks in the Absence of Fire

a. Establish the restricted area and keep people outside of the area and on the upwind side (if possible).

b. Enter the spill area only to aid injured persons; limit entry to the shortest possible time.

c. Unless authorized by the Radiation Authority, do not touch damaged containers or spilled material.

d. Damage to outer container may not affect primary inner container.

e. Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.

f. Large Spills: Dike far ahead of liquid spill for later disposal.

CECC DIRECTOR CHECKLIST

INFORMATION FOR ON SCENE RESPONDERS

EMERGENCY RESPONSE INFORMATION

Preliminary First Aid Measures

a. Call emergency medical care if there are any suspected injuries.

b. Advise medical care personnel that injured persons may be contaminated with radioactive material.

c. Remove injured persons from any possible contaminated areas (unless the injuries are of a severe nature that would make movement inadvisable).

d. If not affecting injury, remove and isolate contaminated clothing and shoes; wrap victim in blanket before transporting.

e. If not injured, detain persons and equipment exposed to radioactive material until arrival or instruction of Radiation Authority.

Attachment C Page 1 of 1

CECC RAM CHECKLIST

1. Review incident information. (Refer to CECC EPIP-22, Attachment A completed by the Operations Duty Specialist and any radioactive material shipping papers that may have been telecopied to the ODS.)

2. Advise the CECC Director as to the level of staffing required to support the TVA response.

3. Select and activate appropriate CECC Radiological staff and Response Team members. Refer to REND for notification listings. Ensure Attachment I is utilized for any call outs

NOTE: A Response Team should be dispatched if radioactive materials require re-packaging. In these events, a radioactive material specialist should accompany the Response Team for technical assistance. Personnel selected for entry into radiological incident areas for field monitoring duties shall be Emergency Environs Sampling Team qualified in accordance with CECC EPIP-9.

The following is provided to assist in notifications: (use as appropriate)

Environs Assessor:_____ Contacted:_____

Field Coordinator:_____ Contacted:_____

Radioactive Material Specialist:_____ Contacted:_____

Response Team Member:_____ Contacted:_____

Response Team Member:_____ Contacted:_____

Dose Assessor:_____ Contacted:_____

Meteorologist:_____ Contacted:_____

Mode of Transportation:_____ Means of Contact:_____

4. Coordinate TVA's radiological assessment activities and keep the CECC Director advised of the status of the TVA response efforts and of radiological assessments.

5. Ensure personnel are briefed on known or anticipated conditions and that they are informed of the agency requesting TVA assistance.

6. Ensure that all immediate notifications are made as required in the TVAN Radioactive Material Shipment Manual.

7. Ensure recovery actions are completed, equipment is returned to an in-service status, and that personnel dosimetry/dose assessment needs are performed.

Attachment D Page 1 of 1

CECC ENVIRONS ASSESSOR AND FIELD COORDINATOR CHECKLIST

Environs Assessor

1. If the shipment originated from a TVA nuclear site, obtain a copy of the shipping papers that would have been telecopied to the ODS.

2. Provide support for field team preparation and dispatch. Ensure equipment and staff needs are completed.

3. In coordination with the RAM, determine response-specific exposure limits and Remaining Allowable Doses for field team personnel and inform them of same.

NOTE: Cross reference exposure control, protective action levels and dose logs with CECC EPIP-9.

4. Confirm Response Team personnel eligibility for expected actions in field response (refer to personnel requirements in CECC EPIP-9).

5. Determine means of communication to be used by the Response Team (operate CECC base radio console as applicable).

6. Review field monitoring instructions per CECC EPIP-9 which apply to the response.

7. Maintain a log of Response Team actions and incoming information reported by the Response Team.

Field Coordinator

1. Ensure that departure preparations are complete and in accordance with any special instructions from the RAM.

2. Accompany Response Team members to the incident location and supervise TVA personnel at the incident scene per section 6.0 and **Attachment F.**

3. Track TVA personnel exposures on scene.

4. Unless instructed otherwise by the RAM, serve as the primary TVA interface with on scene authorities and ensure the CECC is kept informed of operations.

5. Ensure necessary surveys are performed and documented.

6. Ensure recovery actions are completed and any TVA equipment used is returned to service following operations.

Attachment E Page 1 of 2

TRANSPORTATION INCIDENT EQUIPMENT

Transportation Incident Kit Booklet			
	Qty	Item	Remarks
	1	CECC EPIP-23 (Controlled copy)	Rev:
	5	CECC EPIP-23 Attachment G (working copy)	Rev:
	1	CECC EPIP-9 (Controlled copy)	Rev:
*	5	CECC EPIP-9 Shift Information Sheet and Team Dose Tracking Log (working copy)	Rev:
*	5	CECC EPIP-9 Emergency Authorization (working copy)	Rev:
*	10	CECC EPIP-9 Field Team Measurement Log (working copy)	Rev:
*			

General Kit Contents			
	Qty	Item	Remarks
	3	TLDs (list expiration date)	Date:
	3	Direct reading dosimeters (0-200 mrem range)	
	1	Dosimeter charger with battery	
	1	Package KI (list expiration)	Date:
	1	Calculator	
	3	Mechanical pencils and pens (each)	
	1	US Atlas	
	1	Logbook	
	1	DOT Emergency Response Guidebook	Year:

*Revision

Attachment E Page 2 of 2

TRANSPORTATION INCIDENT EQUIPMENT

General Kit Contents			
	Qty	Item	Remarks
	1	Roll 2-inch Radiation Symbol warning tape	
	12	Radioactive Material ID tags	
	6	Radiation/Contamination Area warning signs	
	400 ft.	Yellow and magenta ribbon or rope	
	10	Large yellow plastic bags	
	10	Small yellow plastic bags	
	10	Zip-lock sample bags (approx. 6" and 10")	
	20	Adhesive sample bag labels	
	5	Plastic liquid sample containers (min. 500 ml)	
	5	Charcoal air sampler cartridges	
	5	Silver Zeolite air sampler cartridges	
	1	Air sampler head (for Radeco H 809V)	
	10	Air sampler prefilters	
	10	Plastic petri dishes	
	1	Pair tweezers	
	100	Smears with folders	
	6	Disposable coveralls (anti-contamination)	
	6	Canvas hoods (anti-contamination)	
	6	Skull caps	
	6 pr.	Pair of rubber overshoes	
	6 pr.	Yellow plastic booties	
	12 pr.	Rubber gloves (anti-contamination)	
	12 pr.	Glove liners	
	1 pr.	Work gloves (leather/canvas)	
	12 pr.	Latex gloves (surgeon's type)	
	1	Roll of 2-inch duct tape	
	1	Can spray paint (for area marking)	
	2	Flash lights w/batteries	

Stored location of kit and equipment: _____

Additional comments: _____

Inspected by: _____ Date: _____

Supervisory Review: _____ Date: _____

*

*Revision

INCIDENT SCENE ACTIVITIES
(Environmental Monitoring Team)

1.0 Actions Immediately Upon Arrival

1.1 Each TVA person entering radiation exposure fields shall wear a TLD badge, and a 200 mrem direct reading dosimeter. Record data on CECC EPIP-9 Dose Log.

1.2 Place a radiation survey meter in the ON position on a lower range scale to monitor any increase in background as you approach the area.

1.3 Locate the senior authority at the incident site, identify yourself, and indicate that you are responding at the request of _____ (i.e., the State Division of Radiological Health, Emergency Management Agency, etc.).

1.4 Obtain a briefing from the senior authority on the physical hazards present (chemical, fire, electrical, etc.).

1.5 As necessary, report Attachment H information to the CECC as soon as possible, preferable before proceeding to the following steps.

1.6 If requested by the on scene authority, proceed with the remainder of guidance in this attachment.

NOTE: TVA's obligation is to provide radiological support to the on scene local authorities. The local and state authorities have jurisdiction in the emergency response effort even if a TVA vehicle or shipment is involved in the incident.

2.0 Establishment of Area Control

2.1 Request the on scene authority to have people move back from the incident. Nonessential persons and onlookers should be moved a safe distance away, but be aware that some may already be contaminated if the source has been breached.

Recommend an attempt to identify these persons (i.e., obtain name, address, phone numbers, etc.) and as necessary, isolate these persons for the purpose of performing a contamination survey prior to release. (This may also apply to first responders.)

NOTE: Persons suspected of contamination concerns should immediately be advised not to eat, drink, or smoke until surveyed.

INCIDENT SCENE ACTIVITIES
(Environmental Monitoring Team)

2.2 Advise fire and rescue personnel to stay upwind or crosswind from the location of the source, if possible. Firefighting and rescue efforts should not be interrupted.

CAUTION!:	The life-threatening hazards associated with a vehicle fire and the potential for explosions far outweigh the radiological hazards in almost any case. **DO NOT ENTER A PLUME FROM A FIRE!**

2.3 If fire fighting efforts are in progress, determine the path of the water runoff and, if possible, advise on the containment and control of runoff.

NOTE:	This applies during rainfall as well. Always assume that the source container has failed until confirmed intact.

2.4 If rescue of injured persons is still in progress, offer to survey the patient to assist in any notifications to receiving hospitals.

2.5 Establish a control area using radiation warning rope and signs using guidance from the DOT Emergency Response Guidebook and from best available information. (The initial posted area may be reduced in size as later survey results indicate.)

2.6 If radioactive material has spilled, consider plans to cover/contain the material to reduce its spread. The use of plastic sheeting, plastic bags, or fire department salvage or rescue covers may be used to prevent dispersion by wind, etc.

3.0 Survey of the Incident Scene

3.1 Don appropriate personal protective clothing or equipment in preparation for entry into the incident area. Remember to assume that the area may already have been contaminated and that airborne hazards exist, **UNTIL INFORMATION IS KNOWN TO THE CONTRARY.**

3.2 If a fire prevents surveying the area for the foreseeable future, analysis of a sample of the runoff water may indicate whether the source container has been breached. After best available analysis, double bag the sample to prevent leakage until a more detailed analysis can be obtained.

CAUTION!:	Be attentive to the possibility of chemical contaminates in the runoff. Collect samples only if safe to do so and if the container is able to withstand contact with the liquid.

INCIDENT SCENE ACTIVITIES
(Environmental Monitoring Team)

3.3 If fire and/or smoke is present, and an electrical source is available, attempt to obtain an air sample using the following procedure:

3.3.1 Prepare the air sampler cartridge using a charcoal cartridge (use silver zeolite if Iodine 131 is suspected) and particulate prefilter.

3.3.2 Secure (tape) the extension cord connection with the air sampler plug. While still in a safe area, briefly start the air sampler to adjust the flow rate to 60 liters per minute (2 cfm), then terminate the sample by depressing the STOP key and prepare the sampler to start with the next depression of the START key.

3.3.3 Request that a firefighter in appropriate protective clothing and respiratory protection place the sampler in the plume and depress the START key.

CAUTION!: Be attentive to electrical hazards from water runoff.

3.3.4 Run the sample for 5 minutes unless instructed otherwise. Stop the air sampler by disconnection of the extension cord with the power source.

3.3.5 If a sampling van is present, analyze the cartridge and prefilter according to EPIP-9.

If the sampling van is not available, survey the sample using the Bicron Surveyor 50 for a gross indication of the presence or absence of radioactivity.

CAUTION!: Consider the possibility of the presence of Radon (recount after 30 minutes). Also handle the samples using tweezers and gloves.

3.4 If the on scene authority has declared the area to be free of other physical hazards (fire, chemical, electrical, etc.), one person should prepare to make an entry to the control area to perform radiological monitoring. This should be done only with the permission of the on-scene authority. The other person should remain in the clean area to coordinate communications with the on scene incident command and CECC.

3.5 Establish some means of communications with the person performing the entry into the controlled area. Approach the vehicle (or source) from an upwind direction. The Gieger-Mueller Survey Meter (GMSM) should be adequate to obtain exposure rates.

INCIDENT SCENE ACTIVITIES
(Environmental Monitoring Team)

NOTE:	Allowable DOT radiation limits range on a package ranges from less than 1 mrem/hr up to 1000 mrem/hr, depending on package type and method of transport. Consult the shipping papers (if available) for the expected dose rates on the package and vehicle exterior. Additional advice may be available from a TVA Radioactive Material specialist.

3.6 After exposure rates have been determined and recorded, perform a contamination survey. All radioactive material outside its container should be considered transferable contamination, and smear surveys will also be made. Any object that shows detectable contamination above background shall be considered contaminated no matter how small the amount of activity.

NOTE:	Consider the type of isotope emission when selecting the type of detection instrument. DOT contamination limits allow up to 2200 dpm/100 cm^2 beta-gamma and 220 dpm/100 cm^2 alpha (transferable) on a package. Consult the shipping papers (if available) for vehicle and package contamination measurements.

3.7 The person outside the area should attempt to draw and complete a survey map (**Attachment G**).

3.8 Keep the CECC informed of the survey results.

3.9 If the source container has failed, or if its condition is not known, frisk personnel at the site. Recommend that anyone found to be contaminated above BG levels be evaluated by local RAD Health Authorities. Because TVA has no legal authority at the site, TVA personnel cannot make decisions on releasing contaminated persons.

3.10 Advise the on scene authority on the packaging or control of equipment until surveys can be performed (after personnel needs have been addressed).

3.11 Consult with emergency responders to determine the priority of equipment which need to be surveyed for return to service.

4.0 Additional Services for Transportation Incidents

4.1 Decontamination of persons and equipment (even TVA equipment) is the responsibility of State authorities. If requested to assist, contact the CECC for authorization. It may be possible to provide coveralls for contaminated persons, but keep enough to be able to perform your field monitoring duties.

INCIDENT SCENE ACTIVITIES
(Environmental Monitoring Team)

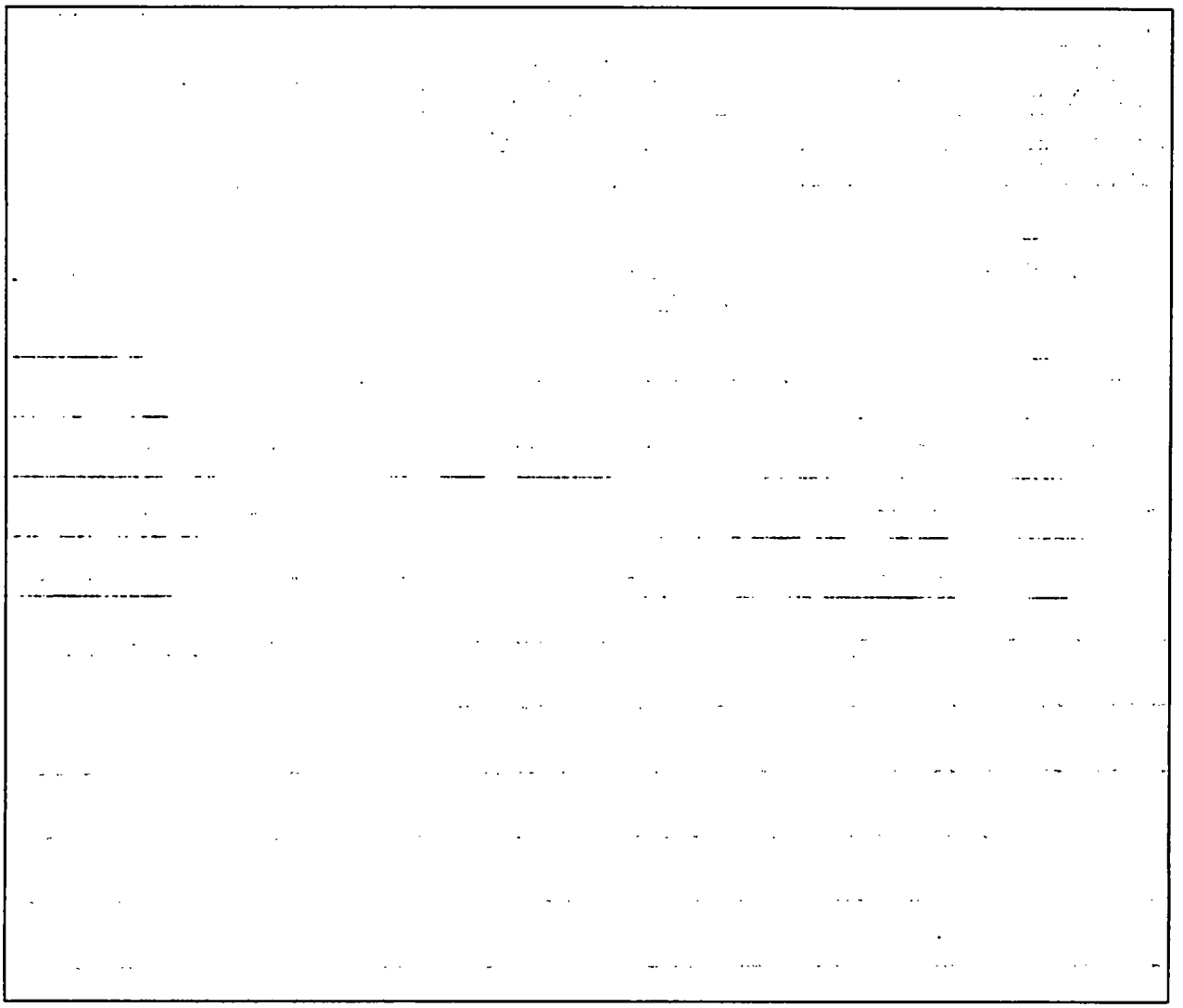
4.2 As applicable, inform the on scene authority at the scene that persons injured and sent to hospitals in the area may be contaminated. If requested by State officials, assistance may be provided at a medical facility if authorization is provided by the CECC.

4.3 Support the coordination of arrangements for the disposal of radwaste.

4.4 The team may support clean-up efforts at the scene as requested by the State until no longer needed or until instructed to depart by the CECC. Consult with the CECC before departing the area.

Attachment G Page 1 of 2

INCIDENT SURVEY FORM



All exposure rate readings in mrem/hr. (contact/30 cm/1 meter).
All contamination levels in dpm/100 cm^2 .

SMEAR SURVEYS		
1.	8.	15.
2.	9.	16.
3.	10.	17.
4.	11.	18.
5.	12.	19
6.	13.	20.
7.	14.	21.

CONTINUED ON BACK

Attachment G Page 2 of 2

INCIDENT SURVEY FORM

Date	Time	Location	
Survey Meter Type:		Serial #	
Survey Meter Type:		Serial #	
Survey Meter Type:		Serial #	
Survey Meter Type:		Serial #	

Additional Comments: Description of incident area, personal protective clothing or protective measures taken during survey, etc.

Signature: _____ Date: _____

Supervisor: _____ Date: _____

Attachment H Page 1 of 1

ONSCENE INCIDENT REPORT

1. Location of incident _____

2. Radioisotopes involved

3. Activity of isotopes

4. Markings: LSA ____, SCO Radioactive ____

5. Description of packages: _____

_____

6. Physical and chemical forms: _____

7. Package identification (specify type A or B, etc.) _____

8. Shipper, carrier, and destination: _____

_____

9. Injuries and receiving hospitals. _____

10. Release(s) of shipment contents to environment: _____

_____

11. Other hazardous materials present (ID numbers, etc): _____

_____

12. Incident description and present status, terrain (including downwind and downslope farms and residential areas). _____

13. Weather conditions. _____

14. Authorities at the scene. _____

15. Phone number (if not using van radio). _____

16. Results of surveys. (Report using CECC EPIP-9 data forms)

NOTE:	Much of this information can be found on the shipping papers. If lost or destroyed in the incident, the driver may be able to help. If all else fails, markings on the vehicle may enable CECC personnel to contact the carrier for information.

ATTACHMENT I Page 1 of 1

FITNESS FOR DUTY PROGRAM ADMINISTRATION

TVA NUCLEAR CALL-IN SHEET

Person Calling: _____ Date: _____

Name	Time Called	Time Needed to Report	Alcohol 5 Hrs.Prior to Report (Y/N)	Fit for Duty (Y/N)	Duty Official Comments