Docket No. 50-213

Attachment No. 1

Haddam Neck Plant

Emergency Plan Procedures

July, 1982

EMERGENCY PLAN PROCEDURES INDEX

NUMBER	REVISION	TITLE	DATE
EPP 1.5-1	Rev. 5	Emergency Assessment	6/30/82
EPP 1.5-2	Rev. 9	Notification and Communication	6/30/82
EPP 1.5-3	Rev. 3	Notification of Unusual Event	6/30/82
EPP 1.5-4	Rev. 3	Alert	6/30/82
EPP 1.5-5	Rev. 3	Site Area Emergency	6/30/82
EPP 1.5-6	Rev. 3	General Emergency	6/30/82
EPP 1.5-7	Rev. 4	Radiological Dose Assessment	7/3/82
EPP 1.5-8	Rev. 3	EOF Emergency Radiological Surveys	1/28/82
EPP 1.5-9	Rev. 3	On-Site Emergency Radiological Surveys	1/28/82
EPP 1.5-10	Rev. 3	Off-Site Emergency Radiological Surveys	11/6/81
EPP 1.5-11	Rev. 2	Personnel Injuries	5/11/82
EPP 1.5-12	Rev. 1	Personnel/Vehicle Monitoring and Decontamination	9/1/81
EPP 1.5-13	Rev. 1	Personnel Accountability	9/1/81
EPP 1.5-14	Rev. 1	Evacuation and Assembly	9/1/81
EPP 1.5-15	Rev. 1	Search and Rescue	9/1/81
EPP 1.5-16	Rev. 1	Fire	9/1/81
EPP 1.5-17	Rev. 1	Emergency Equipment	9/1/81
EPP 1.5-18	Rev. 1	Training and Exercise	9/1/81
EPP 1.5-19	Rev. 1	Emergency Operations Facility Activation	9/1/81
EPP 1.5-20	Rev. 1	Re-entry and Recovery	9/1/81
EPP 1.5-21	Rev. 2	Director of Station Emergency	1/28/82

EMERGENCY PLAN PROCEDURES INDEX

NUMBER	REVISION	TITLE	DATE
EPP 1.5-22	Rev. 2	Manager of Radiological-Consequence Assessment	1/28/82
EPP 1.5-23	Rev. 2	Manager of Security	11/6/81
EPP 1.5-24	Rev. 2	Manager of Communications	1/28/82
EPP 1.5-25	Rev. 2	Manager of Public Information	1/28/82
EPP 1.5-26	Rev. 2	Manager of Control Room Operations	9/1/81
EPP 1.5-27	Rev. 3	Manager of On-Site Resources	7/15/82
EPP 1.5-28	Rev. 3	Manager of Technical Support	7/15/82
EPP 1.5-29	Rev. 1	Emergency Dosimetry Issue	9/1/81
EPP 1.5-30			
EPP 1.5-31	Original	On-shift Health Physics Technician	9/1/81
EPP 1.5-32	Rev. 2	PING Iodine Channel Emergency Procedure	6/30/82
EPP 1.5-33	Rev. 4	Shift Supervisor's Staff Assistant	7/15/82
EPP 1.5-34	Rev. 1	Emergency Telephone Testing	6/3/82
EPP 1.5-35	Original	Explosion, Toxic Gas Release and Major Steam Release	11/6/81
EPP 1.5-36	Original	Use of Potassium Iodide Tablets as a Thyroid Blocking Agent	1/28/82
EPP 1.5-37	Original	Manager of Dose Assessment	1/28/82
EPP 1.5-38	Original	Containment Curie Level Estimation	2/5/82
EPP 1.5-39	Original	Post Accident Sampling of Reactor Coolant	5/31/82
EPP 1.5-40	Original	Post Accident Sampling of Containment Atmosphere	5/31/82

EPP 1.5-2-C
Rev. 9

JUN 3 0 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure
No. EPP 1.5-2

NOTIFICATION AND COMMUNICATION

APPROVED BY STATION SUPERINTENDENT
EFFECTIVE DATE 6-30-82

1.0 PURPOSE

This procedure provides instructions to perform the following:

- o Notify the applicable agencies and personnel in emergency situations.
- o Activate the On-Site Emergency Organization via communication with emergency response personnel.
- o Establish communication interfaces with local, state, and federal agencies.
- o Notify applicable agencies and personnel for reportable situations that do not require activation of emergency plan.
- o Maintain required records.

2.0 RESPONSIBILITY

2.1 The Shift Supervisor and/or Duty Officer shall ensure that this procedure is implemented.

2.2 The Shift Supervisor Staff Assistant (SSSA) is responsible for carrying out the actions of this procedure.

3.0 ACTIONS

3.1 If an emergency action level has not been reached, refer to Attachment 6, Reportable Events for required notifications.

NOTE: Refer to Attachment 9 and 10 to determine when a release is reportable.

JUN 3 0 1982

3.2 Incident classification Golf, Fox, or Echo.
LEVEL ONE Notification.
These classification levels do not require activation of the emergency organization.

3.2.1 Notify duty officer.

NOTE: Notify Unit Superintendent if not the same individual.

3.2.2 Write telephone call-back message on Incident Report form (Attachment 1) and record on code-a-phone recorders.

NOTE: Guidelines on completing the incident report form and the operation of the tape system is included in EPP 1.5-33, Shift Supervisor's Staff Assistant.

3.2.3 Place the level selector toggle switch in the LEVEL ONE position, select the appropriate tape which corresponds to the incident and initiate automatic page by pressing the red alert button.

3.2.4 Within 30 minutes of initiating radio-pager message, review call-back recording to verify that ALL LEVEL ONE pagers have responded. Record on Attachment 2. If the state DEP does not respond in one hour call the 24 hour number at the DEP office

3.2.5 If the radio-pager fails, telephone LEVEL ONE personnel listed in Attachment 5.

3.2.6 Leave telephone call-back recorder information on machines for at least one hour after radiopager is initiated.

3.3 Notification of Unusual Event (State Class Delta).
LEVEL TWO Notification.

3.3.1 Notify duty officer.

NOTE: Notify Unit Superintendent if not the same individual.

3.3.2 Write telephone call-back message on Incident Report form (Attachment 1) and record on code-a-phone recorders.

NOTE: Guidelines on completing the incident report form and the operation of the tape system is included in EPP 1.5-33, Shift Supervisor's Staff Assistant.

3.3.3 Place the level select toggle switch in LEVEL TWO position, select the appropriate tape which corresponds to the incident and initiate the automatic page by pressing the red alert button.

3.3.4 Within 30 minutes of initiating radio-pager message, review call-back recorders excluding the top three code-a-phones to verify ALL LEVEL TWO pagers have responded. Record on Attachment 2.

NOTE: Call back verification need only be conducted on the initial radio-page, change of classification level or when specific instructions direct individuals to call back for further instructions.

3.3.5 Telephone the State Police in Colchester via commercial telephone within one hour to provide a backup to the radio-pager. Record on Backup Phone-Call Message to State Police, Attachment 3.

3.3.6 Attempt to notify via commercial telephone those communities which have not responded to the level two radio-page. (Refer to Attachment 5).

- o Request backup assistance from the appropriate State Police Barracks if attempt to notify non-responding communities via commercial telephone is unsuccessful. (Refer to Attachment 8)

3.3.7 Telephone the NRC within one hour after incident classification (as required by 10CFR50.72).

- o NRC Headquarters - Hotline
- o NRC Regional Office - Telephone line (During normal business hours ONLY)

NOTE: If the NRC Hotline fails to operate, refer to Attachment 4, Emergency Telephone Numbers for NRC Notification.

3.3.8 If the radio-pager system fails, telephone all LEVEL TWO personnel listed in Attachment 5, excluding the local communities.

NOTE: Telephone calls to the local communities will be made by the State Police if the radio-pager is inoperable.

3.4 Alert, Site-Area Emergency, and General Emergency. LEVEL TWO Notification.

3.4.1 Notify duty officer.

NOTE: Notify Unit Superintendent if not the same individual.

3.4.2 Write telephone call-back message on the Incident Report form (Attachment 1) and record on code-a-phone recorders.

NOTE: Guidelines on completing the incident report form and the operation of the tape system is included in EPP 1.5-33, Shift Supervisor's Staff Assistant.

3.4.3 Place the level select toggle switch in the LEVEL TWO position, select the appropriate tape which corresponds to the incident and initiate the automatic page by pressing the red alert button.

NOTE: Provide updates to LEVEL TWO radio-pager holders every 30 to 60 minutes.

3.4.4 Within 30 minutes of the initial radio-pager message, review the call-back recording to verify that ALL LEVEL TWO pagers have responded. Record on Attachment 2.

NOTE: Call-back verification need only be conducted on the initial radio-page, change of classification level or when specific instructions direct individuals to call back for further instructions.

3.4.5 Telephone the State Police in Colchester via the dedicated line located on the SSSAs console, within one hour to provide a backup to the radio-pager. Record on Backup Phone-Call Message to the State Police, Attachment 3.

3.4.6 Attempt to notify via commercial telephone those communities which have not responded to the level two radio-page. (Refer to Attachment 5.)

- Request backup assistance from the appropriate State Police Barracks if attempt to notify non-responding communities via commercial telephone is unsuccessful. (Refer to Attachment 8.)

3.4.7 Telephone the NRC within one hour after incident classification (as required by 10CFR50.72).

- NRC Headquarters - Hotline
- NRC Regional Office - Telephone line (During normal business hours ONLY)

NOTE: If the NRC hotline fails to operate, refer to Attachment 4 Emergency Telephone Numbers for NRC Notification.

3.4.8 If the radio-pager system fails, telephone all LEVEL TWO personnel listed in Attachment 5, excluding the local communities.

NOTE: Telephone calls to the local communities will be made by the state police if the radio-pager is inoperable.

3.5 Notify support agencies for assistance using Attachment 7 for telephone numbers.

4.0 ATTACHMENTS/EXHIBITS

Attachment	Title	Page
1	Incident Report Form	
2	Call-Back Verification Checklist	
3	Backup Phone Call Message to State Police	
4	Emergency Telephone Numbers for NRC Notification	
5	Notification Guide	
6	Reportable Events	
7	Assistance Guide	
8	Connecticut State Police (CSP) Contact Points	
9	Reportable Releases	
10	Bases for Attachment 9	

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-33, Shift Supervisor's Staff Assistant.

ATTACHMENT 1
INSTRUCTIONS FOR
Incident Report Form

1. This message is prepared by the facility operator and put on the telephone call back system recorders, or if the pager telephone call back system is inoperative use alternate means as specified in procedures.

2. The facility operator sends out radiopager messages. Individuals receiving this message call-in to get more information from the telephone recording machines. They also leave their names and affiliation and time at the tone at the end of the recorded message.

3. Individuals calling in to the telephone recorder should use this form to copy down the information.

4. The preparer of the message (facility operator) should not use technical jargon, abbreviations, etc. This person should use general layman language as much as possible.

5. The preparer of the message should say "information not available" and "not applicable" when appropriate.

6. The following is the relationship between the State of Connecticut State Nuclear Incident Classification Scheme and the NRC Incident Classes as given in NUREG-0654.

CT State Class	NRC Class
ECHO	Unusual event without radioactive releases.
DELTA	Unusual event with radioactive releases.
CHARLIE-ONE	Alert
CHARLIE-TWO	Site Area Emergency
BRAVO	General emergency without major breach in containment integrity.
ALPHA	General emergency with major breach in containment integrity.

7. The message prepared (facility operator) should use CHARLIE-ONE as the mechanism for generating an alert if it is apparent that the potential exists for an event more serious than DELTA, but event classification is not yet final. This will enable the local community, state agencies, and utility emergency staff to begin assembly at their emergency operations centers in a timely manner while the accident assessment is being done.

ATTACHMENT 1 (Continued)
INCIDENT REPORT

(Telephone Call-Back Message Form)
(Instructions on Back)

Report Number _____
(Optional)

1. This is _____ of _____
(name & title of person sending message) (organization)

2. In accordance with the State Emergency Plan, this report concerns the HADDAM NECK Nuclear Power Station.

3. This IS / IS NOT a drill.

4. A State of Connecticut Incident Class (circle worst case)

GOLF FOX ECHO DELTA CHARLIE-ONE (ALERT) CHARLIE-TWO

BRAVO ALPHA

is being reported on _____ at _____.
(date) (time)

5. IF GOLF, FOX, ECHO, DELTA, CHARLIE-ONE (ALERT) skip to item 10.

6. The affected zones are as follows: (Enter only if distance specified in classification scheme is extended - Example A1, B1, C1 thru A10, B10, C10)

Class	Zones			Time
ALPHA	_____	thru	_____	_____
BRAVO	_____	thru	_____	_____
CHARLIE-TWO	_____	thru	_____	_____

7. The wind is from the _____ into _____ at _____MPH.
(example NNW) (example SSE)

8. It is expected to remain in the direction for _____hours.

9. It IS / IS NOT expected to shift and blow from _____.
(example NNW)

10. The event description follows: _____

_____

_____

_____

_____

_____

11. Access to the site HAS / HAS NOT been terminated.

12. The following has been requested: FIRE / POLICE / AMBULANCE / _____.
(other)

ATTACHMENT 1 (Continued)

13. The plant status is STABLE / IMPROVING / DEGRADING.

14. A further report WILL / WILL NOT be given.

15. Please leave your name, affiliation and time at sound of tone.

END OF MESSAGE

ATTACHMENT 2

CALL-BACK VERIFICATION CHECKLIST

Level 1	Code A Phone #	Time	Date
CY Duty Officer			
NU Operation Duty Officer			
NU Public Affairs Duty Officers			
Department of Environmental Protection			
Mr. Sillin			
Mr. Ellis			
Mr. Fee			
Mr. Counsil			
Mr. Cagnetta			
Mr. Opeka			

Level 2 State Agencies			
Governors Office			
Office of Civil Preparedness			
State Police at Colchester			
" " at Hartford			
" " at Westbrook			

ATTACHMENT 2 (Continued)

JUN 3 0 1982

Level 2 Towns	Code A Phone #	Time	Date
Chester			
Colchester			
Deep River			
Durham			
East Hampton			
Essex			
Haddam			
East Haddam			
Hebron			
Killingworth			
Lyme			
Madison			
Marlborough			
Middlefield			
Middletown			
Portland			
Salem			
Westbrook			

Level 2 CY	ETA
Manager of Communication	
Manager of Radiological Assessment	
Manager of Onsite Resources	

ATTACHMENT 3

BACKUP PHONE CALL MESSAGE TO STATE POLICE

(1) THIS IS THE HADDAM NECK NUCLEAR PLANT

(2) A STATE INCIDENT CLASS DELTA/CHARLIE-ONE/CHARLIE-TWO/BRAVO/ALPHA MESSAGE WAS SENT OUT OVER THE RADIOPAGER

(3) TAKE FOLLOW-UP ACTION WITH STATE DEP

Name of Sender	Date	Time

Name of Receiver (State Police)

Towns which have not responded:

ATTACHMENT 4

EMERGENCY TELEPHONE NUMBERS FOR NRC NOTIFICATION

	TELEPHONE SYSTEM	TELEPHONE NUMBER
1.	Emergency Notification System to NRC Operations Center	(Lift Receiver from Cradle)
2.	Commercial Telephone System to NRC Operations Center (via Bethesda Central Office)	
3.	Commercial Telephone System to NRC Operations Center (via Silver Spring Central Office)	
4.	Health Physics Network to NRC Operations Center	)
5.	Commercial Telephone System to NRC Operator (via Bethesda Central Office)	

ATTACHMENT 5
NOTIFICATION GUIDE

ORGANIZATION	NOTIFICATION LEVEL	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	TELEPHONE NUMBERS HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
Connecticut Yankee	1 & 2	Station Superintendent	R. H. Graves					
Notify all listed		Unit Superintendent	J. H. Ferguson					
		Services Superintendent	R. Z. Test					
		Security Shift Supv.	----------					
Northeast Utilities Nuclear Engineering and Operations	1 & 2	Duty Officer	T. Dente					
		Duty Officer	B. Dietz					
Notify One of listed starting with Duty Officer.		Duty Officer	H. Wong					
		Duty Officer	J. Quinn					
		Duty Officer	W. Bartron					
NUSCO Duty Officer Night-Line 1-666-3944		Duty Officer						

EPP 1.5-2-C
Rev. 9 JUN 3 0 1982

ATTACHMENT 5 (Continued)
NOTIFICATION GUIDE

ORGANIZATION	NOTIFICATION LEVEL	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	TELEPHONE NUMBERS HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
		Supt.Nuclear Operation	J. F. Opeka					
		Sr. Vice Pres. Nuclear Eng/Ops	W. G. Counsil					
		Exec.Vice Pres. Nuclear Eng/Ops	W. F. Fee					
Northeast Utilities System Communication	1 & 2	Duty Officer	A. E. Nericcio					
Notify one of listed starting with Duty Officer		Duty Officer	E. C. Hill					
		Duty Officer	R. A. Winkler					
		Duty Officer	R. S. Bromberg					
		Duty Officer						
		Manager System Nuclear Info.	G. R. Doughty					

ATTACHMENT 5 (Continued)
NOTIFICATION GUIDE

ORGANIZATION	NOTIFICATION LEVEL	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
State Dept. of Environmental Protection	1 & 2	Commissioner	S. Pac		Radio Pager			
		No response to GOLF, FOX, ECHO radiopage within 1 hr. of initiation						
Nuclear Regulatory Commission	2	Region I I & E	----------		Use Hot Line to Bethesda			
		Resident Inspector	Tom Smith					
State Police	2	Colchester	Dispatcher					
Northeast Utilities	As Needed	Manager Ins. & Claims	R. M. Seger					
		Insurance analyst	R. R. Iffland					
Local Communities	2	Chester	First Selectman		(24 hour number)			
		Colchester	First Selectman					
		Deep River	First Selectman					
		Durham	First Selectman					
		East Haddam	First Selectman					
		East Hampton	Chief Administrative Officer		(24 hour number)			
		Essex	First Selectman		(24 hour number)			
		Haddam	Fire Dispatcher					
		Hebron	First Selectman					
		Killingworth	First Selectman		(24 hour number)			
		Lyme	First Selectman					
		Madison	First Selectman					
		Marlborough	First Selectman					
		Middlefield	First Selectman					
		Middletown	Mayor					

ATTACHMENT 5 (Continued)
NOTIFICATION GUIDE

ORGANIZATION	NOTIFICATION LEVEL	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
Local Communities	2	Portland	First Selectman		(24 hour number)			
		Salem	First Selectman		------			
		Westbrook	First Selectman		(24 hour number)			

ATTACHMENT 6
REPORTABLE EVENTS

	EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
1	General Emergency	A or B	within 15 min.	Within 1 hour Hot Line	2
2	Site Area Emergency	C2	Within 15 min.	Within 1 hour Hot Line	2
3	Alert Emergency	C1	Within 15 min.	Within 1 hour Hot Line	2
4	Notification of Unusual Event	D	Within 15 min.	Within 1 hour Hot Line	2
5	Any event requiring initiation of the licensee's emergency plan or any section of that plan.	---	---	---	---
6	The exceeding of any Technical Specification Safety Limit.	E	Within few hours	With 1 hour Hot Line Note 1	1
7	Any event that results in the nuclear power plant not being in a controlled or expected condition while operating or shut down.	E	Within few hours	Within 1 hour Hot Line Note 1	1

NOTE 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

	EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
8	Any act that threatens the safety of the nuclear power plant or site personnel, or the security of special nuclear material, including instances of sabatoge or attempted sabotage.	E	Within few hours	Within 1 hour Hot Line Note 1	1
9	Any event requiring initiation of shutdown of the nuclear power plant in accordance with Technical Specification Limiting Conditions for Operation.	E	Within few hours	Within 1 hour Hot Line Note 1	1
10	Personnel error or procedural inadequacy which, during normal operations, anticipated operational occurrences, or accident conditions, prevents or could prevent, by itself, the fulfillment of the safety function of those structures, systems, and components important to safety that are needed to (i) shut down the reactor safely and maintain it in a safe shutdown condition, or (ii) remove residual heat following reactor shutdown, or (iii) limit the release of radioactive material to acceptable levels or reduce the potential for such release.	E	Within few hours	Within 1 hour Hot Line Note 1	1

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

ATTACHMENT 6 (Continued)
REPORTABLE EVENTS

	EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
11	Any event resulting in manual or automatic actuation of Engineered Safety Features, including the Reactor Protection System.	E	Within few hours	Within 1 hour Hot Line Note 1	1
12	Any accidental, unplanned, or uncontrolled radioactive release. (Normal or expected releases from maintenance or other operational activities are not included.)	D	Within 15 min.	Within 1 hour Hot Line Note 1	2
13	Any fatality or serious injury occurring on the site and requiring transport to an offsite medical facility for treatment.	E	Within few hours	Within 1 hour Hot Line Note 1	1
14	Any serious personnel radioactive contamination requiring extensive onsite decontamination or outside assistance.	E	Within few hours	Within 1 hour Hot Line Note 1	1
15	Any event meeting the criteria of 10 CFR 20.403 for notification.	E	Within few hours	Within 1 hour Hot Line Note 1	1

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

	EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
16	Strikes of operating employees or security guards, or honoring of picket lines by these employees.	E	Within few hours	Within 1 hour Hot Line Note 1	1
17	Event of significant public interest but of no public hazard. No radioactive release. Includes but is not limited to: a. Any unscheduled shutdown estimated to last more than 48 hours. (State) b. Any scheduled shutdown for testing, maintenance, or refueling expected to last more than 72 hours. (State) c. Derating caused by Regulatory Action. (State) d. Derating greater than 50% caused by equipment malfunction lasting more than 72 hours. (State)	E	Within few hours	-------	1

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
e. Loss or damage to major system components. (NUSCO)				
f. Fish kill, unusual fish entrapments, or unusual environmental situation. (NUSCO)				
g. Oil spill or other contaminants into river water. (State)		Note 3		
h. Incident that required police assistance. (State)				
i. Incident that requires fire department assistance for fire lasting LESS than 10 minutes. (State)				

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

Note 2 Requires a telephone call by the Duty Officer to the NUSCO Nuclear Operations Duty Officer perferably the day of occurrence but no later than the morning of the next work day.

Note 3 Requires a telephone call to the Coast Guard, National Resource Center and Spill Response Center of Connecticut within a few hours of occurring. (Refer to Assistance Guide for telephone numbers.)

	EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
18	Reports of theft or loss of radioactive material in accordance with 10 CFR 20.402 (Ref. 10 CFR 30.71)	F	Within few hours	Within hours	1
19	Radioactive material transport accident	G	Within few hours	--------	1
20	Reports of overexposure and excessive levels and concentrations in accordance with 10 CFR 20.405.	E	Within few hours	30 Day	1
21	All Section 6.9.2-a Safety Technical Specification Reports	E	Within few hours	24 Hours	1
22	All Section 6.9.2-b Safety Technical Specification Reports			30 Day Note 2	
23	All Section 5.6.2-a(1) Environmental Technical Specification Reports	E	Within few hours	24 Hours	1
24	All Section 5.6-2-a(2) Environmental Technical Specification Reports			30 Day Note 2	

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

Note 2 Requires a telephone call by the Duty Officer to the NUSCO Nuclear Operations Duty Officer preferably the day of occurrence but no later than the morning of the next working day.

ATTACHMENT 6 (Continued)
REPORTABLE EVENTS

	EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
25	All Section 5.6.2-b(1) Environmental Technical Specification Reports			10 Day Note 2	
26	All Section 5.6.2-b(2) Environmental Technical Specification Reports			30 Day Note 2	
27	All Section 5.6.2-c Environmental Technical Specification Reports			30 Day Note 2	
28	Any unexpected or unanticipated service water system leaks within containment IEB 80-11-21-80	E	Within few hours	24 Hours	1
29	Major loss of physical security effectiveness which allow unauthorized and undetected access to vital area. a. Loss of all communications to summon State Police.	E	Within few hours	Within 1 hour hotline Note 1	1

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

Note 2 Requires a telephone call by the Duty Officer to the NUSCO Nuclear Operations Duty Officer preferably the day of occurrence but no later than the morning of the next working day.

EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
b. Complete loss of both CAS and SAS of which compensatory measures are <u>not</u> in place within 10 min. of event providing a level of security equivalent to that existing prior to the event.				
c. Attempted and confirmed intrusion into the protected and vital areas.				
30. Moderate Loss of Security Effectiveness	E	Within few hours	24 hours	1
a. Theft of security weapon at site.				
b. Confirmed tampering with security equipment.				
c. Unexplained fire or explosion within protected or vital area that could affect plant security.				

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

ATTACHMENT 6 (Continued)
REPORTABLE EVENTS

EVENTS	STATE EMERGENCY CLASSIFICATION	STATE REPORTING REQUIREMENT	NRC REPORTING REQUIREMENT	NOTIFICATION LEVEL
d. Security related injury to a security member caused by malfunctioning of security equipment.				
e. Complete loss of either CAS or SAS.				
31. Serious damage to plant equipment or facilities.			Note 4	
32. Load decrease greater than 25% or anticipated removal of unit from service within next 24 hours.			Note 4	

Note 1 10CFR50.72 item. Report on NRC Hot Line using attached form. During normal hours telephone regional office also (see notification guide attached).

Note 2 Requires a telephone call by the Duty Officer to the NUSCO Nuclear Operations Duty Officer preferably the day of occurrence but no later than the morning of the next working day.

Note 3 Requires a telephone call to the Coast Guard, National Resource Center and Spill Response Center of Connecticut within a few hours of occurring. (Refer to Assistance Guide for telephone numbers.)

Note 4 Requires a telephone call by the Duty Office to the NUSCO Nuclear Operations Duty Officer within one hour of determination.

ATTACHMENT 7
ASSISTANCE GUIDE

AGENCY	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	TELEPHONE NUMBERS HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
State Police	Colchester	Dispatcher					
Fire Department	Haddam Neck	Dispatcher					
Ambulance	East Hampton	Dispatcher					
Hospital	Middlesex Memorial						
	Lawrence Memorial						
Doctor	Medical Consultant	Dr. H. Levine					
Radiation Management Corp	President	Dr. R. Linnemann					
Coast Guard	Captain of the Port	Lieutenant M. A. Conway					
State Office of Civil Preparedness							
National Resource Center	Duty Officer						

AGENCY	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	TELEPHONE NUMBERS HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
Spill Response Center of Connecticut							
State Department of Environmental Protection							
Brookhaven National Laboratory	Chief Engineer Operations	D. Schnelley					
Combustion Engineering		R. Hoover					
Electric Boat C.	Director Rad Control (normal weekday) Rad Control Foreman (off hours, weekends) Guard Force						
United Nuclear Corporation	Manager Nuclear/Industrial Safety	W. F. Kirk					
Millstone	Unit 1	Shift Supervisor					
	Unit 2	Shift Supervisor					
INPO							
		Emergency Telecopier					

AGENCY	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	TELEPHONE NUMBERS HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
Westinghouse	Field Service Manager	Dave Campbell					
	1st Alternate	Ron VonOsinski					
	2nd Alternate	Curt Webb					
	Service Response Manager	Joe Lablang					
	1st Alternate	John Miller					
	2nd Alternate	Dave Campbell					

AGENCY	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	TELEPHONE NUMBERS HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
Westinghouse (Continued)	Emergency Response Director	Hank Ruppel					
	Emergency Response Deputy Director	Ron Lehr					
	Emergency News Communications	Mike Mangan					
Shipman Fire Equipment	General Manager	E. Wallace					
AMTRACK	General Superintendent	R. Duggan					
Dattco, Inc.	President	L. A. DeVivo					

ATTACHMENT 7 (Continued)
ASSISTANCE GUIDE

AGENCY	TITLE	NAME	TELEPHONE NUMBERS BUSINESS	TELEPHONE NUMBERS HOME	NOTIFICATION DOCUMENTATION DATE	TIME	PERSON CONTACTED
Beebe Transportation	General Manager	M. O'Leary					
Nichols Bus	President	C. Nichols					
Interex Corporation		D. Newton R. Fix					
Teledyne Isotopes		A. Hayter J. D. Martin H. Jeter					
Travelers Weather Service							

JUN 3 0 1982

ATTACHMENT 8

CONNECTICUT STATE POLICE (CSP) CONTACT POINTS

HADDAM NECK

Colchester CSP Barracks (Troop K)
Via Hot Line

Colchester
East Haddam
East Hampton
Hebron
Marlborough
Portland
Salem

Westbrook CSP Barracks (Troop F)
Via Telephone:

Chester
Deep River
Durham
Essex
Haddam
Killingworth
Lyme
Madison
Middlefield
Middletown
Westbrook

NOTE: This list is to be used AFTER station attempt to contact local communities by telephone.

JUN 3 0 1982

Attachment 9

Reportable Releases

The following releases are reportable:

1. Any release, liquid or gaseous, exceeding technical specifications.

2. Any release from a release path which does not have an established monitor or sampling program and a grab sample indicates that release concentrations exceeded:

   1×10^{-7} uCi/ML for liquids or,

   1×10^{-10} uCi/cc for airborne particulates or iodine or,

   2×10^{-8} uCi/cc for airborne noble gases.

3. Any increase in noble gas release rates which is greater than 1500 uCi/sec above the normal (existing) release rate and this increase is not due to a planned or expected event.

   Note 1: It is recognized that what constitutes a "planned or expected event" is still ambiguous at this time. However, the following philosoply should be used:

   i) If the increased release rate is less than 1500 uCi/sec above normal it is not reportable even if the cause of the increase is unknown or unplanned.

   ii) If the increase is greater than 1500 uCi/sec, but is due to a planned activity which is known to be the cause (e.g. - Increasing power level, releasing a waste gas tank, purging the containment, etc.) then the release is not reportable provided it remains below the technical specification limits.

   iii) If the increase is greater than 1500 uCi/sec, and the cause was unplanned (e.g. - Lifting of a relief valve, error in valve line-up, etc.) or the cause is still unknown, then the release should be reported.

   Note 2; The stack monitor reading in CPM (CPS for MP1) which corresponds to the normal reading plus 1500 uCi/sec depends on the normal reading at that time, the latest monitor calibration factor, and the number of ventilation fans operating. Since these parameters are subject ot change, so is the corresponding monitor reading. Thus, it should be required that a member of the Chemistry Department determine the appropriate reading and post it for the operator's use. This should be done at least weekly and after any significant change in power level or a new monitor calibration curve developed).

Example - MP2 stack monitor

Normal reading has been running at 25 CPM
Present monitor calibration factor = 6.2 uCi/sec per CPM (assuming 2 fan operation)
Thus, 1500 uCi/sec = 240 CPM
Thus, monitor reading corresponding to reportable level = 240 CPM + 25 CPM = 265 CPM
This value and the monitor calibration factor should be posted for the operator's use. Also, the alarm set point should be set at or below 265 CPM.

Attachment 10

JUN 3 0 1982

Bases for Attachment 9

Criteria 1 - Exceeding tech spec limits

This criteria is clear. Any release, whether due to a planned or unplanned event or activity, must be reported if the tech spec limits were exceeded.

Criteria 2 - Unmonitored Releases

i) Established Monitor -

Any release from a path which has a fixed monitor (e.g. - stack, MP1 isolation condenser vent, SGBD line, etc.) would not be reportable due to the unmonitored release criteria. If the monitor was inoperable, but grab samples were being taken in accordance with the action statements in the technical specifications, then likewise any releases would not be reportable.

ii) Established Sampling Program -

There are certain paths which do not have a fixed monitor but have an established sampling program where grab samples are obtained on a fixed schedule. The main reason these pathways are not monitored is because the potential release rates are less than the lower limit of detection for gross monitors. Since grab samples are more sensitive, they are used to detect and hence account for any low level releases from these pathways. Thus, for example, any releases detected coming from the MP1 Condensate Storage Tank vent would not be reportable since there exists an established sampling program to measure the level of gases in the tank and account for the activity released.

iii) Release Concentrations - 1×10^{-7} uCi/ml, etc.

There are numerous release paths of trivial amounts of plant related radioactivity at our sites which are not monitored or sampled. Some examples of these are PWR turbine building exhaust, opening a door from the outside to get into the PAB, opening a contaminated laundry drum outside, etc. If samples were taken from some of these pathways and

counted at low background laboratory, plant related activity could be detected. This is a recognized fact. It is also recognized that the total contribution from these pathways is trivial and insignificant compared to the releases from the monitored release paths. Hence, these releases do not have monitoring or sampling requirements.

There is a potential for releases of non-trivial levels of radioactivity from unmonitored paths. This would most likely be due to an accident, equipment failure or human error (e.g. - a leak develops in a tank trunk being used to trasnfer liquid wastes onsite).

Criteria are, therefore, required to determine which unmonitored releases are trivial and do not require reporting and which are non-trivial and should be reported.

The concentrations listed in Attachment 1 represent the dividing line. The concentrations given are the most limiting value from either 10CFR20 - Appendix B - Table II (maximum Permissible Concentrations in Air and Water Outside the Site Boundary) or 10CFR30.70 Schedule A (Exempt Concentrations in Gas and Liquids.)

Criteria 3 - Unplanned Releases

The routine operation of a nuclear power plant results in numerous increases and decreases in gaseous release rates. Valve packing and pump seals may leak at various rates, startup or shutdown of a system may result in brief puff releases due to pressure transients, opening up a system for maintenance will release trapped gases, etc. Most of these changes are so small that they cannot be detected on the stack monitor. Some of them may cause slight increases in the monitor response. Any release of significant levels will cause a significant increase in the monitor response.

It is not feasible for an operator to explain every minor increase in the stack monitor reading due to the wide range of trivial events which could result in this increase. In addition, it does not make sense to report all such increases as it would lead to a large volume of reports which serve no purpose but to prove that the routine operation of a nuclear plant results in numerous increases and decreases in gaseous release rates.

It is therefore necessary to define the difference between these minor increases and a significant increase. If the release is significant, then it should either be due to a planned or expected event or it should be reported. In order to avoid differences in interpretations, the dividing line between minor increases and significant increases should be as specific as possible. The only practical way to do this is to define it as a specific release rate. This release rate was determined to be 1500 uCi/sec.

The value 1500 uCi/sec was chosen based on the following facts:

1. The limiting noble gas concentration from 10CFR20 - Appendix B - Table II for offsite noble gas concentrations is 2×10^{-8} uCi/sec for kr-88. The maximum annual average X/Q from either the CY stack, MP1 stack or MP2 stack at the critical site boundary is 1.3×10^{-5} sec/M^3. Assuming this X/Q, the required release rate to get 2×10^{-8} uCi/cc is:

   2×10^{-8} uCi/cc/(1.3×10^{-5} sec/m^3 . 10^{-6} m^3/cc) = 1540 uCi/sec

   Thus, for the most limiting nuclide, the most limiting release point, and the most limiting site boundary, a release rate of 1500 uCi/sec will result in concentrations less than allowed by 10CFR20.

2. For the same limiting site boundary and CY stack release point, the expected 1 hour dose from a release rate of 1500 uCi/sec should be in the range of 0.001 - 0.003 mrem which is less than the expected hourly background dose of 0.005 to 0.01 MREM.

3. The noble gas concentration in CY primary coolant is approximately 2 uCi/ml. Thus, a leakage rate of 750 ml/sec would result in a release of 1500 uCi/sec into building air and eventually to the stack. 750 ml/sec is equal to 11 gallons per minute which is not untypical of potential leakage rates from leaking valves or pumps.

4. The present background reading on the CY stack monitor is 500 cpm. The present calibration factor is about 3 uCi/sec per cpm. Therefore, 1500 uCi/sec = 500 cpm which is a practical level to detect above the present reading.

5. The present background reading on the MP1 stack monitor is 6 cps. The present calibration factor is about 57 uCi/sec per cps. Therefore, 1500 uCi/sec = 26 cps which is a practical level to detect above the present reading.

6. The present background reading on the MP2 stack monitor is 26 cpm. The present calibration factor is about 6.2 uCi/sec per cpm. Therefore, 1500 uCi/sec = 240 cpm which is a practical level to detect above the present reading.

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-32

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 6-30-82

PING IODINE CHANNEL
EMERGENCY PROCEDURE

1.0 PURPOSE

1.1 To detail the operation of the Control Room Iodine monitor during a Radiological emergency.

2.0 RESPONSIBILITIES

2.1 H.P. Supervisor - Supply control room with adequate number of silver impregnated silica gel cartridges.

2.2 Plant Operations Personnel - Startup PING after notification of a Radiological emergency.

2.3 Plant Operations Personnel - Record readings from PING Iodine channel as listed in Section 3.4.

2.4 HP Technician - Perform 6 month calibration and monthly operational check.

2.5 Assistant R.P.S. - File completed calibration and monthly check sheets.

3.0 ACTIONS

3.1 Prerequisites

3.1.1 All control room operators and personnel shall be briefed on the operation of the PING in a Radiological emergency.

3.1.2 PING shall have its efficiency checked every six months. Enter data on Attachment 1.

3.1.3 PING shall be operationally checked monthly Enter data on Attachment 2.

3.1.4 A copy of Attachment 1 containing the latest calibration data shall be kept on the PING for information.

3.2 Precautions

3.2.1 PING shall only be used in a Radiological emergency.

3.2.2 Iodine channel BKG subtract should be in "IN" position.

3.2.3 Silver loaded silica gel cartridges should remain in sealed container until needed. Do not remove for demonstrations or drills.

3.3 Acceptance Criteria

3.3.1 Eberline PING Manual.

3.3.2 Satisfactory monthly operational check.

3.4 Procedure

3.4.1 Remove silver loaded silica gel iodine cartridge from container and install in PING.

3.4.2 Initiate PING operation by turning power switch to "ON" position.

3.4.2.1 Record time of start up on Attachment 3.

3.4.3 Record reading from PING channel after 30 minutes on Attachment 3.

3.4.3.1 If the "High Level Alarm" alarms within the first 30 minutes, don respiratory protection for Iodine airborne activity.

Note: High Level Alarm is designated by a red light on Front panel and audible alarm; set at I^{131} MPC valve of 9×10^{-9} µCi/ml. It signifies that further actions must be taken.

3.4.3.2 Notify Health Physics.

3.4.4 Record readings at 30 minute intervals on Attachment 3.

3.4.4.1 If the "High Level Alarm" alarms after the first 30 minute period, shutdown the PING and insert a new Iodine filter cartridge. Restart the PING and record the time on Attachment 3.

3.4.4.2 Monitor the rate of increase on the Iodine channel.

3.4.4.3 After 10 minutes, record the reading from the PING Iodine channel on Attachment 3.

3.4.4.4 If this reading is 1/3 of the High Level Alarm setpoint (Section V on calibration sheet), the I^{131} MPC limit has been exceeded. Don Iodine Respiratory protection.

3.4.4.5 If this reading is 1/3 of the High Level Alarm setpoint, continue recording readings every 30 minutes.

3.4.4.6 When the "High Level Alarm" alarms, repeat steps in Section 3.4.4.

Note: All Iodine cartridges which are removed shall be saved for laboratory analysis and shall contain the following information: time/date in, time/date out or time/date alarm and CPM readout from PING Iodine channel whe.. removed.

3.5 Check-Off Lists

3.5.1 PING bi-weekly checklist Attachment 2.

3.6 Record Keeping

3.6.1 The latest PING Iodine channel calibration sheet shall be retained by the Assistant R.P.S.

3.6.1.1 A copy of this sheet shall be kept on the side or top of the PING to provide the necessary information for the monthly operational checks.

3.6.1.2 The completed monthly operational check lists shall be retained by the Assistant R.P.S.

3.6.1.3 After the PING has been recalibrated, the previous calibration sheets and the corresponding monthly check lists shall be forwarded to Nuclear Records.

3.6.2 The PING emergency log shall be kept in the control room.

4.0 ATTACHMENTS

1. PING Iodine Channel Efficiency Sheet.
2. PING Monthly Check List.
3. PING Emergency Operation Log.

5.0 PROCEDURE CROSS REFERENCE

None

Attachment 1

PING IODINE CHANNEL EFFICIENCY SHEET

I. PING Serial Number: _____

Date: _____

II. Iodine Channel Efficency = $C = \frac{A}{B} \times .9787$

A = Iodine channel readout in CPM = _____ CPM

B = Ba^{133} Source strength in µCi = _____ µCi

C = _____ CPM/µCi

III. Iodine Channel Readout Rate of Change for I^{131} MPC

Value of 9.0×10^{-9} µCi/ml = D = C x F.R. x 10^3 x 9.0×10^{-9}

C = Iodine Channel Efficiency = _____ CPM/µCi

F. R. = Flow Rate from PING Flow Meter = _____ LPM

D = _____ CPM/MIN

IV. Alert Alarm (10% of I^{131} MPC for 30 minutes) = E = D x 30 x .1

D = Rate of Change for I^{131} MPC value = _____ CPM/MIN

Alert Alarm Setpoint E = _____ CPM

V. High Level Alarm (100% of I^{131} MPC for 30 min.) = F = D x 30

High Level Alarm Setpoint F = _____ CPM

Calibration of this instrument is complete and acceptable and has been performed in accordance with EPP# _____ ☐ YES ☐ NO (CHECK ONE)

_____	_____	_____
HP Technician	Date	Date Due
_____	_____	
Reviewed by	Incal data entered	

JUN 3 0 1982

Attachment 2

PING MONTHLY CHECK-OFF LIST

PING Serial Number: _____

Date: _____

1. Unit Start-up Yes _____ No _____

2. Adequate Flow Rate:

   Flow Rate from Calibration Sheet: _____ LPM
   Flow Rate Range ± 10% _____ LPM to _____ LPM
   Flow Rate from PING Flow Meter _____ LPM
   Acceptable: _____
   Unacceptable: _____

3. Source Check

   "C" Value from PING Calibration Sheet: _____ CPM/uCi
   Acceptable Range ± 10% _____ CPM/uCi to _____ CPM/uCi
   Ba^{133} Source Strength: _____ uCi = B
   Source in, I^{131} Channel Readout: _____ CPM = A
   I^{131} Efficiency = $C = \frac{A}{B} \times .9787 =$ _____ CPM/uCi

   Acceptable: _____
   Unacceptable: _____

4. High Level Alarm Check

   High Level Alarm Set Point: _____ CPM
   Did it alarm at set point: Yes _____ No _____

COMMENTS:

NOTES:

1. Unit should be checked weekly.
2. This form must be filed and saved.
3. If the unit is found unacceptable in any one or more of the above checks, it must be repaired or recalibrated within 8 hours.

Calibration of this instrument is complete and acceptable and has been performed in accordance with EPP# _____ ☐ Yes ☐ No Check one

_____ _____ _____
HP Technician Date Date Due

_____ _____
Reviewed By Incal data entered

PING EMERGENCY OPERATION LOG

JUN 3 0 1982

Date: _____

Time PING Started: _____

TIME	I^{131} Channel CPM	Filter Changed		Comments
		Yes	No	

JUL 0 3 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 7-3-82

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-7

RADIOLOGICAL-DOSE ASSESSMENT

1.0 PURPOSE

This procedure provides the instructions for calculating projected doses during an alert, a site-area emergency, or a general emergency:

- o to the whole body from released noble gases
- o to the child thyroid from radioiodines

2.0 RESPONSIBILITY

2.1 The Manager of Radiological Consequence Assessment is responsible for directing the Dose-Assessment Team to implement this procedure. The Manager has the responsibility to inform the Director of Station Emergency Operations (SEO) of the assessment; however, only the Director has the authority to recommend protective actions to off-site authorities.

2.2 The Shift Supervisor, until relieved by the Director of SEO, will make protective-action recommendations to off-site authorities.

3.0 ACTIONS

3.1 Dose-Calculation Data Sheet (attachment 1).

3.1.1 Using monitor readings and meteorological data, complete the Dose-Calculation Data Sheet.

3.2 Whole-Body Dose Assessment at Site Boundary.

3.2.1 Complete part 1 of attachment 2, Noble-Gas Release Rate, as follows:

3.2.1.1 If grab sample results are available from the monitored release paths, enter the release rate in Ci/s in item 5, and enter 0 in the Ci/s space for the corresponding monitor so that the release estimates are not doubled for that release path.

NOTE: The Chemistry Dept., Radiation Assessment Branch (RAB), or designated group will calculate release rates in Ci/s based upon grab samples, if taken.

NOTE: If no grab-sample results are available, enter 0 in Ci/s in item 5.

3.2.1.2 Record the Wide Range Stack Gas Monitor (RMS-14B) reading in uCi/s.

Calculate and enter the release rate in curies per second (Ci/s).

NOTE: Enter zero in item 2 if RMS-14B is in operation.

NOTE: If the monitor is inoperable, enter zero in the Ci/s in item 1.

3.2.1.3 If the Wide Range Stack Gas Monitor (RMS-14B) is inoperable, record the main stack monitor (RMS-14A) in counts per minute.

Calculate and enter the release rate in curies per second (Ci/s).

3.2.1.4 If the containment pressure is greater than 2 pounds per square inch (psig) (available from control room), enter the containment-hatch monitor reading in R/hr. Calculate and enter the release rate in Ci/s.

NOTE: If the containment pressure is less than 2 psig, enter 0 in Ci/s in item 3.

3.2.1.5 If a steam-generator tube rupture is believed to have occurred and if releases are in progress from the atmospheric steam dump or Terry Turbine, then determine the release rate as follows.

An Emergency Team will be designated and obtain the dedicated teletector located at the Health Physics control point and perform the following survey:

- o Take a general-area background reading at the base of stairs leading up to the atmospheric steam-dump line.
- o Climb up to the platform located under the atmospheric steam-dump line.
- o Take a dose-rate reading 3 feet radially out from the bottom surface of the muffler on the atmospheric steam-dump line.

Report this reading, minus background reading, to the Manager of Radiological Consequence Assessment.

- o Enter net reading in mR/hr in item 4. Calculate and enter the release rate in Ci/s in item 4.

- o If a positive reading above background is obtained, repeat above four items every 15 minutes until releases terminate and record results.

NOTE: If there are no releases from this pathway, enter 0 in Ci/s in item 4.

3.2.1.6 If all monitors for the known release points are inoperable and no grab-sample results are available, determine the type of accident which has occurred and enter one of the default release-rate values in Ci/s in item 6.

NOTE: If monitoring or grab-sample results are available from the appropriate release points, enter 0 in Ci/s in item 6.

3.2.1.7 The total noble-gas release rate will be the sum of items 1 through 6. Enter on Line 7.

3.2.2 Complete part 2 of attachment 2, Whole-body Dose at Site Boundary, as follows:

3.2.2.1 Enter the total noble-gas release rate from part 1.

3.2.2.2 Record the wind speed in miles per hour. Determine and enter the corresponding wind-speed correction factor.

3.2.2.3 Determine and enter the appropriate release-height correction factor based on release point.

3.2.2.4 Calculate and enter the whole-body dose rate at the site boundary from the equation:

$$\text{Dose Rate (mrem/hr)} = \left[\begin{array}{c}\text{Total Noble-}\\ \text{Gas Release}\\ \text{Rate}\end{array}\right] \times \left[\begin{array}{c}\text{Wind-Speed}\\ \text{Correction}\\ \text{Factor}\end{array}\right] \times \left[\begin{array}{c}\text{Release-Height}\\ \text{Correction}\\ \text{Factor}\end{array}\right] \times 0.7$$

3.2.2.5 Determine and enter the actual or predicted duration of the release.

If the release has terminated, enter the actual duration in hours. Do not use 1 hour for short releases. For example: for a 6-minute release, enter 0.1 hour and not 1 hour.

If the release has not terminated, project the expected duration.

If projected duration is unknown, enter 10 hours.

JUL 0 3 1992

3.2.2.6 Calculate and enter the projected whole-body dose at the site boundary from the equation:

$$\text{Dose (mrem)} = \left[\text{Whole-Body Dose Rate}\right] \times \left[\text{Duration of Release}\right]$$

3.3 Thyroid-Dose Assessment at Site Boundary.

3.3.1 Complete part 1 of attachment 3, Calculation of X/Q Value, as follows:

3.3.1.1 Enter the wind speed, u.

3.3.1.2 Record the temperature differential (ΔT) at 196' in ^{o}F from the computer readout in the EOF or control room.

3.3.1.3 Determine and enter the Xu/Q value corresponding to the ΔT.

3.3.1.4 Calculate and enter $\frac{X}{Q}$ from the equation:

$$\frac{X}{Q}\ (s/m^3) = \frac{Xu/Q}{u} \times 2.2$$

3.3.2 Complete part 2 of attachment 3, Iodine Release Rate, as follows:

3.3.2.1 If release rates based on iodine grab-sample results are available from the Chemistry Department, RAB, or other source, enter the data in item 4 and go on to step 3.3.3 of this procedure.

3.3.2.2 If iodine grab-sample results are not available, enter the total noble-gas release rate from item 7, part 1, attachment 2 in item 1, part 2, of attachment 3.

3.3.2.3 Determine and enter the $\frac{\text{Iodine}}{\text{Noble Gas}}$ ratio.

3.3.2.4 Calculate and enter the iodine release rate from the equation.

$$\text{Release Rate (Ci/s)} = \left[\text{Total Noble-Gas Release Rate}\right] \times \left[\frac{\text{Iodine}}{\text{Noble Gas}}\ \text{Ratio}\right]$$

3.3.3 Complete part 3 of attachment 3, Thyroid Dose at Site Boundary, as follows:

3.3.3.1 Enter the $\frac{X}{Q}$ value from item 4, part 1, of attachment 3.

3.3.3.2 Enter the iodine release rate from item 3 or 4, part 2, of attachment 3.

3.3.3.3 Calculate and enter the iodine concentration at the site boundary from the equation:

$$\text{I-131 (uCi/cc)} = \frac{X}{Q} \times \text{Iodine Release Rate}$$

3.3.3.4 Determine and enter the predicted or actual duration of the release.

If the release has terminated, enter the actual duration in hours. Do not use 1 hour for short releases. For example: for a 6-minute release enter 0.1 hour and not 1 hour.

If the release has not terminated, project the expected duration.

If the projected duration is unknown, enter 10 hours.

3.3.3.5 Calculate and enter the projected thyroid dose at the site boundary from the equation:

$$\text{Dose (mrem)} = \text{I-131 Concentration} \times \text{Duration Of Release} \times 5 \times 10^{8}$$

3.4 Whole-Body and Thyroid-Dose Assessments at Locations beyond the Site Boundary

3.4.1 If the site-boundary whole-body dose is greater than 5 mrem but less than 50 mrem, or the thyroid dose is greater than 25 mrem but less than 250 mrem, complete item 3 of attachment 4 as follows:

3.4.1.1 Divide 5 by the site-boundary whole-body dose.

3.4.1.2 Divide 25 by the site-boundary thyroid dose.

3.4.1.3 Using Attachment 6, page 20, determine the distance in kilometers to which the dose exceeds 5 mrem to the whole body or 25 mrem to the thyroid.

3.4.1.4 Calculate the distance in miles by dividing the kilometers by 1.6.

3.4.2 If the site-boundary whole-body dose is greater than 50 mrem but less than 1000 mrem, or the thyroid dose is greater than 250 mrem but less than 5000 mrem, complete item 4 of attachment 4 as follows:

3.4.2.1Divide 50 by the site-boundary whole-body dose.

3.4.2.2 Divide 250 by the site-boundary thyroid dose.

3.4.2.3 Using Attachment 6, page 20, determine the distance in kilometers to which the dose exceeds 50 mrem to the whole body or 250 mrem to the thyroid.

3.4.2.4 Calculate the distance in miles by dividing the kilometers by 1.6.

3.4.3 If the site-boundary whole-body dose is greater than 1000 mrem but less than 5000 mrem, or the thyroid dose is greater than 5000 mrem but less than 25000 mrem, complete item 5 of attachment 4 as follows:

3.4.3.1 Divide 1000 by the site-boundary whole-body dose.

3.4.3.2 Divide 5000 by the site-boundary thyroid dose.

3.4.3.3 Using Attachment 6, page 20, determine the distance in kilometers to which the dose exceeds 1000 mrem to the whole body or 5000 mrem to the thyroid.

3.4.3.4 Calculate the distance in miles by dividing the kilometers by 1.6.

3.4.4 If the site-boundary whole-body dose is greater than 5000 mrem or the thyroid dose is greater than 25000 mrem, complete item 6 of attachment 4 as follows:

3.4.4.1 Divide 5000 by the site-boundary whole-body dose.

3.4.4.2 Divide 25000 by the site-boundary thyroid dose.

3.4.4.3 Using Attachment 6, page 20, determine the distance in kilometers to which the dose exceeds 5000 mrem to the whole body or 25000 mrem to the thyroid.

3.4.4.4 Calculate the distance in miles by dividing the kilometers by 1.6.

3.5 Downwind Sectors Affected by the Release.

Using Attachment 7, page 21, and the wind-direction value from item 8 of attachment 1, determine and enter the down-wind sector affected by the release in attachment 5, item 1.

3.6 Recalculations.

3.6.1 Doses should be recalculated when directed to by the Manager of Radiological Consequence Assessment, which would typically result if:

- Wind direction changes by more than 45° or wind speed by more than 5 mph.

- o Actual or estimates of release-rate change by more than a factor of 3.

- o The maximum levels measured by field monitoring teams indicate dose rates or iodine concentrations 3 times greater than or less than the calculated values for comparable locations and times. In this case, the calculations should be rechecked for errors, and the field monitoring teams should expand their surveys and verify original measurements.

3.7 Report the results of all calculations to the Manager of Radiological Consequence Assessment.

4.0 ATTACHMENTS

5.0 PROCEDURE CROSS REFERENCE

5.1 Safety Technical Specification-Section 6.16.

JUL 0 3 1982

Attachment 1

Dose-Calculation
Data Sheet

1. Wide Range Stack Gas Monitor (RMS-14B) reading: _____uCi/s.

2. Main-Stack Monitor Reading: _____cpm

3. Containment Hatch Monitor Reading:
(only if containment pressure is greater than 2 psig) _____R/hr

4. Survey Data from Terry Turbine or
Atmospheric Steam Dump: _____mR/hr

5. Type of Accident: _____

6. ECCS Operating as Designated: Yes or No _____

7. Wind Speed:* _____mph @ 33' level

_____mph @ 196' level

8. Wind Direction:* _____° @ 33' level

_____° @ 196' level

*196-foot data if only main-stack releases are present. Use 33-foot data for all cases.

9. AT at 196 feet: _____°F

10. Estimated or Actual Duration Release: _____hr

11. All calculations must be carried out to 3 decimal places.

Recorded by_____

Date_____

Time_____

Attachment 2

JUL 0 3 1982

WHOLE-BODY DOSE ASSESSMENT

PART 1 - Noble-Gas Release Rate

1. Wide Range Stack Gas Monitor (RMS-14B) _____uCi/s x 10^6 = _____Ci/s

2. Main Stack Monitor (RMS-14A) _____cpm x 5×10^{-6} = _____C /s

3. Containment-Hatch Monitor: (If containment pressure is 2 psig) _____R/hr x 1.2×10^{-4} _____Ci/s

4. Atmospheric Steam-Dump Monitor or Terry Turbine: _____mR/hr x 2.5×10^{-3} = _____Ci/s

5. Grab-Sample Results: from main stack _____Ci/s

   from containment hatch _____Ci/s

6. Default Values: (if no information available) _____Ci/s

LOCA - ECCS working	3.3 Ci/s
LOCA - ECCS not working	33 Ci/s
SG-tube rupture	4.0 Ci/s
Fuel-handling accident	170.0 Ci/s

Attachment 2 (Continued)

WHOLE-BODY DOSE ASSESSMENT

7. Total Noble-Gas Release Rate (one of the following):

   o Sum of items 1 through 5 _____ Ci/s

   o Value from item 6 only if all monitors from known release points inoperable and no grab-sample results available _____ Ci/s

8. Enter total noble-gas release rate from item 7 in item 1 of part 2.

PART 2 - Whole-Body Dose at Site Boundary

1. Total Noble-Gas Release Rate: _____ Ci/s

2. Wind Speed: _____ mph
(196' data if only main stack releases are present. Use 33' data in all other cases)

3. Wind-Speed Correction Factor: _____ Wind Speed Correction Factor

Wind Speed (mph)	Correction Factor
Less than 2	2.5
2-7	2.0
8-11	1.5
Greater than 11	1.0

4. Release-Height Correction Factor: _____ Release Height Correction Factor

Release Point	Correction Factor
Main Stack Only	3.5
Any Other	6.0

If releases are from both points, enter 6.0

5. Whole-Body Dose Rate at Site Boundary:

[Total Noble-Gas Release Rate] [Wind-Speed Correction Factor] [Release-Height Correction Factor]

_____ X _____ X _____ X 0.7 = _____ mrem/hr.

JUL 0 3 1982

Attachment 2 (Continued)

WHOLE-BODY DOSE ASSESSMENT

PART 2 - Whole-Body Dose at Site Boundary (Continued)

6. Actual or Predicted Duration of Release: _____hr

   If the release is continuing and the duration is unknown, enter a value of 10.

7. Projected Whole-Body Dose at Site Boundary:

[Whole-Body Dose Rate]		[Duration of Release]		
_____	x	_____	=	_____mrem

8. If the PROJECTED WHOLE-BODY DOSE exceeds 5 mrem, enter the value in item 1 of attachment 4.

Attachment 3

JUL 0 3 1982

THYROID-DOSE ASSESSMENT

PART 1 - Calculation of X/Q Value

1. Wind Speed:
(enter 1 if < 1.0 mph)

_____ mph @ 33'

_____ mph @ 196'

NOTE: Use 196-foot data if only main-stack releases are present. Use 33-foot data in all other cases.

2. Temperature Differential ΔT at 196 feet: _____ ^{o}F

3. $\frac{Xu}{Q}$: _____ $\frac{Xu}{Q}$

ΔT	Xu/Q
≥ +0.5°F	2×10^{-3}
-1.6 < ΔT < +0.5°F	5×10^{-4}
≤ -1.6°F	1×10^{-4}

4. $\frac{X}{Q}$:

$$\frac{X}{Q} = \left[\frac{Xu/Q}{Wind\ Speed}\right] \times 2.2$$

$$\frac{X}{Q} = \left[\frac{\quad}{\quad}\right] \times 2.2 = \_\_\_\_\_ s/m^3$$

Attachment 3 (Continued)

JUL 0 3 1982

THYROID-DOSE ASSESSMENT

PART 2 - Iodine Release Rate

1. Total Noble-Gas Release Rate: _____ Ci/s
(from item 7, part 1, attachment 2)

2. (Iodine/Noble Gas) Ratio

Type of Accident	(Iodine/Noble Gas) Ratio	Ratio
LOCA	0.06	
SG-Tube Rupture	0.0005	
Fuel-Handling Accident	0.004	
Any Other	0.003	

3. Iodine Release Rate:

[Total Noble-Gas Release Rate] [Iodine/Noble Gas Ratio]

I-131 Release Rate = _____ x _____ = _____ Ci/s

4. I-131 Release Rate from Iodine Grab-Sample Data = _____ Ci/s

Attachment 3 (Continued)

JUL 0 3 1982

THYROID-DOSE ASSESSMENT

PART 3 - Thyroid Dose at Site Boundary

1. $\frac{X}{Q}$: _____ s/m^3
(from item 4, part 1, of attachment 3)

2. Iodine Release Rate: _____ Ci/s
(from item 3 or 4, part 2, of attachment 3)

3. Iodine Concentration at Site Boundary:

[$\frac{X}{Q}$] [Iodine Release Rate]

I-131 = _____ x _____ = _____ uCi/cc*

*Note: 1 Ci/m^3 = 1 uCi/cc.

4. Predicted or Actual Duration of Release: _____ hr
(If the release is continuing and the duration is unknown, enter a value of 10.)

5. Projected Thyroid Dose at the Site Boundary:

[I-131 Concentration] [Duration of Release]

[_____] x [_____] x $5x10^8$ = _____ mrem

6. If the projected thyroid dose exceeds 25 mrem, enter the value in item 2 of attachment 4.

Attachment 4

JUL 0 3 1982

WHOLE-BODY AND THYROID-DOSE ASSESSMENTS AT LOCATIONS BEYOND THE SITE BOUNDARY

1. Projected Whole-Body Dose Site Boundary:
(from item 7, part 2, of attachment 2) _____ mrem

2. Projected Thyroid Dose at Site Boundary:
(from item 5, part 3, of attachment 3) _____ mrem

3. Distance to Which State Emergency-Classification Charlie-1 Exists:

Whole-Body Dose greater than 5 mrem but less than 50 mrem
Thyroid Dose greater than 25 mrem but less than 250 mrem

$$\frac{5}{\left[\text{Whole-Body Dose}\right]} = \frac{5}{\left[\quad\right]} = \_\_\_\_\_ \text{ (a)}$$

$$\frac{25}{\left[\text{Thyroid Dose}\right]} = \frac{25}{\left[\quad\right]} = \_\_\_\_\_ \text{ (b)}$$

Use smaller of (a) or (b) and figure 1, page 21, to determine corresponding distance in kilometers:

Distance = _____ km

Distance in Miles:

$$\frac{\left[\text{Kilometer Distance}\right]}{1.6} = \frac{\left[\quad\right]}{1.6} = \_\_\_\_\_ \text{ miles}$$

4. Distance to Which State Emergency-Classification Charlie-2 Exists:

Whole-Body Dose greater than 50 mrem but less than 1000 mrem
Thyroid Dose greater than 250 mrem but less than 5000 mrem

$$\frac{50}{\left[\text{Whole-Body Dose}\right]} = \frac{50}{\left[\quad\right]} = \_\_\_\_\_ \text{ (a)}$$

Attachment 4 (Continued)

JUL 0 3 1982

WHOLE-BODY AND THYROID-DOSE ASSESSMENTS AT LOCATIONS BEYOND THE SITE BOUNDARY

$$\frac{250}{[\text{Thyroid Dose}]} = \frac{250}{[\quad]} = \_\_\_\_\_ \text{ (b)}$$

Use smaller of (a) or (b) and figure 1 to determine corresponding distance in kilometers:

Distance = _____ km

Distance in Miles:

$$\frac{[\text{Kilometer Distance}]}{1.6} = \frac{[\quad]}{1.6} = \_\_\_\_\_ \text{ mi}$$

5. Distance to Which State Emergency-Classification Bravo Exists:

Whole-Body Dose greater than 1000 mrem but less than 5000 mrem
Thyroid Dose greater than 5000 mrem but less than 25000 mrem

$$\frac{1000}{[\text{Whole-Body Dose}]} = \frac{1000}{[\quad]} = \_\_\_\_\_ \text{ (a)}$$

$$\frac{5000}{[\text{Thyroid Dose}]} = \frac{5000}{[\quad]} = \_\_\_\_\_ \text{ (b)}$$

Use smaller of (a) or (b) and figure 1, page 21, to determine corresponding distance in kilometers:

Distance = _____ km

Distance in Miles:

$$\frac{[\text{Kilometer Distance}]}{1.6} = \frac{[\quad]}{1.6} = \_\_\_\_\_ \text{ mi}$$

JUL 0 3 1982

Attachment 4 (Continued)

WHOLE-BODY AND THYROID-DOSE ASSESSMENTS AT LOCATIONS BEYOND THE SITE BOUNDARY

6. Distance to Which State Emergency-Classification Alpha Exists:

Whole-Body Dose 5000 mrem
Thyroid Dose 25000 mrem

$$\frac{5000}{\left[\begin{array}{c}\text{Whole-Body}\\ \text{Dose}\end{array}\right]} = \frac{5000}{\left[\quad\right]} = \_\_\_\_\_ \text{ (a)}$$

$$\frac{25000}{\left[\begin{array}{c}\text{Thyroid}\\ \text{Dose}\end{array}\right]} = \frac{25000}{\left[\quad\right]} = \_\_\_\_\_ \text{ (b)}$$

Use smaller of (a) or (b) and figure 1, page 21, to determine corresponding distance in kilometers:

Distance = _____ km

Distance in Miles:

$$\frac{\left[\begin{array}{c}\text{Kilometer}\\ \text{Distance}\end{array}\right]}{1.6} = \frac{\left[\quad\right]}{1.6} = \_\_\_\_\_ \text{ mi}$$

JUL 0 3 1982

Attachment 5

DOWNWIND SECTORS AFFECTED BY RELEASE

1. Wind Direction (from item 8 of Attachment 1) _____ o 196' level

   _____ o 33' level

2. Downwind Direction

   _____ o ± *180o = _____ o
   Wind Direction

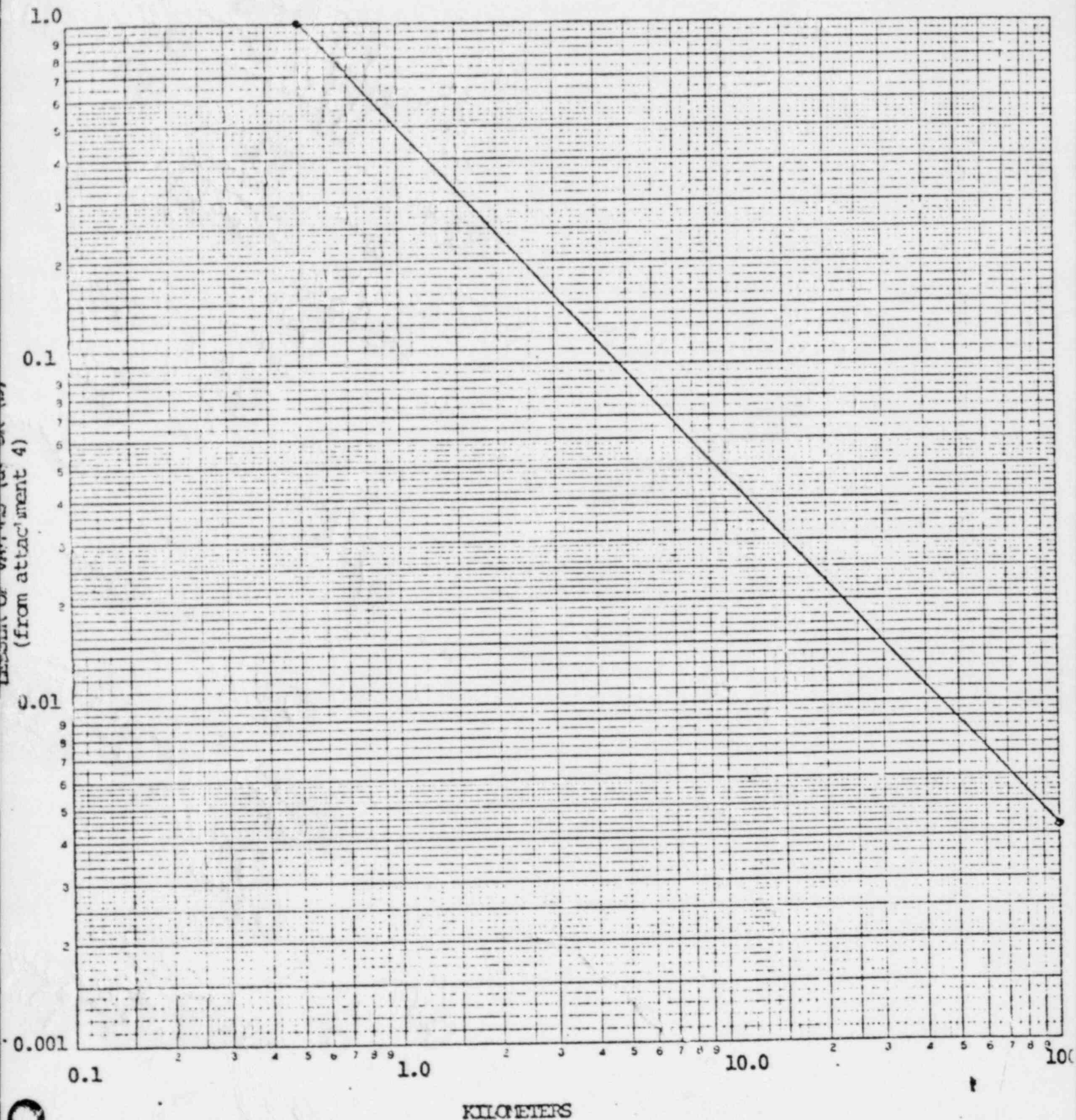
   * Add or subtract such that result in between 0o and 360o

3. Downwind Sector (from Attachment 7, page 21) _____

Attachment 6

JUL 0 3 1982

DOSE REDUCTION FACTOR
WITH DISTANCE



JUL 0 3 1982

Attachment 7

WIND DIRECTIONS + SECTORS

DIRECTION WIND IS FROM	DOWNWIND DIRECTION	DOWNWIND SECTOR
169° - 191°	349° - 11°	A (N)
192° - 213°	12° - 33°	B (NNE)
214° - 235°	34° - 56°	C (NE)
237° - 258°	57° - 78°	D (ENE)
259° - 281°	79° - 101°	E (E)
282° - 303°	102° - 123°	F (FSE)
304° - 326°	124° - 146°	G (SE)
327° - 348°	147° - 168°	H (SSE)
349° - 11°	169° - 191°	J (S)
12° - 33°	192° - 213°	K (SSW)
34° - 56°	214° - 236°	L (SW)
57° - 78°	237° - 258°	M (WSW)
79° - 101°	259° - 281°	N (W)
102° - 123°	282° - 303°	P (WNW)
124° - 146°	304° - 326°	Q (NW)
147° - 168°	327° - 348°	R (NNW)

Attachment 8

JUL 9 3 1982

BASES FOR RADIOLOGICAL-DOSE ASSESSMENT

The details behind each of the values and conversion factors in this procedure are on file with the NUSCO Radiological Assessment Branch. However, the basic assumptions and methodologies include:

1. Monitor response as function of noble-gas activity assumes an average gamma energy of 0.8 MeV.

2. Iodine to noble-gas ratios and default-value release rates are based on the results of design-basis accident calculations and assume the appropriate decay and filtration.

3. Effluent-flow rates assume normal operating-flow rates.

4. $\frac{X}{Q}$s are based on Workbook for Atmospheric Dispersion Estimates by

   D. B. Turner, 1967, for the particular release height, stability class, and wind speed in question. Calculations are done at a distance of 500 meters from the release point.

5. Iodine-dose conversion factors are based on the EPA's Manual of Protective Action Guides and are for the child's thyroid.

6. Dose rate-reduction factors with distance are based on the results of the AIREM code and on Turner's Workbook.

JUN 0 3 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-34

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 6-3-82

EMERGENCY TELEPHONE TESTING

1.0 PURPOSE

To provide instruction and guidelines for the monthly/quarterly/annual testing of the communications systems at Connecticut Yankee.

2.0 RESPONSIBILITY

2.1 The NUSCO Radiological Assessment Branch is responsible for initiating the monthly telephone test and for quarterly verification of Offsite Agency/Support Organization Telephone Number List.

2.2 Assigned personnel or their designee are responsible for participating in the test.

2.2.1 Control Room (Shift Supervisor/Designee)

2.2.2 Technical Support Center (Operations Supervisor/Designee)

2.2.3 Emergency Operations Facility (Health Physics or Designee)

2.2.4 State and Local Governments (Shift Supervisor Staff Assistant).

2.3 The Administrative Office Supervisor is responsible for reporting all problems to SNET Co. for immediate repairs.

3.0 ACTIONS

3.1 A monthly communication check of the Level 2 radiopager will be initiated by the Shift Supervisor Staff Assistant.

3.1.1 The first Wednesday of each month is designated as the test day.

3.1.2 If a public holiday is on the first Wednesday, the drill will be conducted on Thursday.

JUN 0 3 1982

3.1.3 The drill will be initiated at 2:00 p.m.

3.1.4 A prerecorded radiopager message for a Delta drill will be used. (Refer to EPP 1.5-33)

3.1.5 The Radiological Assessment Branch will provide the text with the event description section of the incident report.

NOTE: Refer to EPP 1.5-33 for information pertaining to the operation of the radiopager.

3.2 The monthly telephone communications test will be conducted on the first Wednesday of each month at 2:00 p.m.

Note: If a holiday occurs on the first Wednesday, the test will be conducted on thursday.

3.3 The telephone test shall be initiated at the EOF using the test sheet. (Attachment 1)

3.3.1 Fill in date, time and your name.

3.3.2 Answer question on "Routine Test" (a routine test is the once a month test occuring on the first Wednesday of the month or Thursday, when subject to a holiday.

3.3.3 Test the commercial telephone lines first using

3.3.3.1 Test outgoing and incoming calls for each phone.

3.3.3.2 Verify a ring can be heard over the line for outgoing calls.

3.3.3.3 Check if connection is good when answered and verify illumination of the light.

3.3.3.4 If connection is bad or there is no answer, call CY extension for that room to verify problem. (Refer to attachment 2)

3.3.3.5 Following resolution of the problem, request a return call.

3.3.3.6 Before answering, check the light and after answering, check off the sheet under incoming call.

3.3.4 Verify operational use of dedicated lines. (Refer to Attachment 1)

3.3.4.1 Complete steps 3.3.3.1 through 3.3.3.6.

NOTE: On some commercial lines and dedicated lines no ring may be heard over the line and many phones do not have lights. Where the questions in Attachment 1 do not apply, insert N/A.

3.5 After the test sheet is completed, assure the following is performed:

3.5.1 Enter the test date, time and any problems in the log book which is located in the EOF.

3.5.2 Log any repairs or circuit changes.

3.5.3 Notify the Administrative Office Supervisor (ext. of any problems.

NOTE: If Office Supervisor is unavailable, report the problems directly to the phone company , giving circuit numbers. Notify the Office Supervisor of any calls to the phone company.

3.5.4 Sign the completed test sheet and bring to the Nuclear Records Department.

3.6 A quarterly check of the offsite support call list test will be performed by NUSCO RAB in accordance with CONI-10.01.

3.7 Communications with the monitoring teams and between emergency responce centers are tested during the annual drill.

4.0 ATTACHMENTS

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-33, Shift Supervisor Staff Assistant.

5.2 CONI-10.01, Emergency and Telephone Communication Test Procedure.

Attachment 1

JUN 0 3 1982

EMERGENCY PHONE TEST SHEET

Date: Time: By:

Routine Test: Yes/No If "No", explain: _____

DIAL PHONES	Outgoing Call						Incoming Call					
	RING		CONNECTION		LIGHT		RING		CONNECTION		LIGHT	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

NOTE: Some commercial lines do not have lights. Where questions do not apply, insert N/A.

Attachment 1 (Cont.)

JUN 0 3 1982

EMERGENCY PHONE TEST SHEET

Date: Time: By:

Routine Test: Yes/No If "No", explain: _____

DEDICATED PHONES	Outgoing Call						Incoming Call					
	RING		CONNECTION		LIGHT		RING		CONNECTION		LIGHT	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Hot lines from EOC to:												
Corporate Manager Public Information												
Corporate Manager External Commun.												
Corporate Manager Rad.Con.Assess.(RA)												
Corporate Manager Rad.Con.Assess.(DA)												
Corporate Manager Resources												
Director of Corp. Emergency Oper.												
Station Control Room												
Technical Support Ctr.(Communicator)												
Technical Support Center (Director)												
Shift Supervisor Staff Assistant												
NRC												
Hot lines from Oper. Support Center to:												
Control Room												

Attachment 1 (Cont.)

EMERGENCY PHONE TEST SHEET

Date: Time: By:

Routine Test: Yes/No If "No", explain: _____

DEDICATED PHONES	Outgoing Call						Incoming Call					
	RING		CONNECTION		LIGHT		RING		CONNECTION		LIGHT	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Hot lines from Control Room to:												
NRC												
State Police												
NUSCO Room W-270												
Hot lines from Tech. Support Center to:												
NUSCO TSC												

Note: On some dedicated lines no ring may be heard over the line and many phones do not have lights. Where questions do not apply, insert N/A.

JUN 0 3 1982

Attachment 2

EMERGENCY RESPONSE FACILITY EXTENSIONS

A. Technical Support Center (Operations Supervisor's Office)
(Extension

B. Operations Support Center (Emergency Operations Facility)
(Extension

C. Resource Center (Emergency Operation Facility)
(Extension

D. Emergency Operations Center
(Extension

EPP 1.5-11-C
Revision 2 (MAJOR)

MAY 1 1 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-11

PERSONNEL INJURIES

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 5-11-82

1.0 PURPOSE

This procedure provides instructions for responding to personnel injuries with or without associated contamination.

2.0 RESPONSIBILITIES

2.1 The Shift Supervisor is responsible for implementing this procedure.

2.2 Health Physics technicians and/or the Nurse are responsible for performing required first aid.

2.3 The SSSA is responsible for off-site communications to the ambulance service and to hospitals when there is no nurse on station.

3.0 ACTIONS

3.1 Injured Personnel Report to the Nurse and Must Leave the Plant Site.

3.1.1 The Station Nurse will call the Control Room and give the following information to the SSSA:

- o Name of injured person.
- o Ambulance transportation is or is not required.
- o Brief description of the injury or illness, including conscious or unconscious.

3.1.2 If ambulance transporation is required, the SSSA will call 911 and report the following information:

- o An ambulance is needed at Connecticut Yankee
- o Number of personnel needing transportation
- o Brief description of injuries including whether personnel are conscious or unconscious
- o The injured personnel are not contaminated
- o Transportation will be to Middlesex Memorial in Middletown (Lawrence Memorial Hospital in New London is a backup in case of large numbers of injured, contaminated people).

3.1.3 The Nurse will notify the receiving hospital.

3.1.4 The SSSA will notify Security who will direct a member of the security staff to meet the ambulance at the north gate.

3.1.5 Implement EPP 1.5-2, Notification and Communication.

3.2 Injured Personnel Are Found Inside or Outside of the Protected Area.

3.2.1 Upon notification that injured personnel have been found, the shift supervisor will sound the station annunciation alarm and follow that with an announcement over the plant page system requesting the shift health physics technician and/or the station nurse report to the location of the injured personnel.

NOTE: If the station nurse does not respond to the announcement, the SSSA will initiate a manual radio page directed to the nurse.

3.2.2 The shift health physics technician or station nurse will call the Control Room and give the following information to the SSSA:

- o Name of injured person.
- o Person is or is not contaminated, if known.

- o Ambulance transportation is or is not required
- o Brief description of the injuries, including conscious or unconscious

3.2.3 If ambulance transporation is required, the SSSA will call 911 and report the following information.

- o An ambulance is needed at Connecticut Yankee
- o Number of personnel needing transportation
- o Brief description of injuries, including conscious or unconscious.
- o The injured person is or is not contaminated, if known
- o Transportation will be to Middlesex Memorial

3.2.4 NOTE: The SSSA must receive all the information listed under 3.2.2 prior to notifying the receiving hospital.

3.2.5 If on station, the nurse will notify the receiving hospital. If the nurse is not on station, the SSSA will notify one of the following hospitals,

- o Middlesex Memorial:
  (ask for the Emergency Room Physician)
- o Lawrence Memorial:

and provide the following information, with followup reports as necessary:

- o This is Connecticut Yankee
- o Name of injured person being transported to hospital
- o Brief description of injuries, including conscious or unconscious.
- o The injured person is or is not contaminated.

3.2.6 The SSSA will notify Security who will direct a member of the security staff to meet the ambulance at the north gate.

3.2.7 The shift supervisor or Director of Station Emergency Operation will ensure that a Connecticut Yankee health physics technician is at the receiving hospital if the injured personnel being transported are contaminated.

- o During normal business hours, an on-shift health physics technician will be assigned to accompany the ambulance to the hospital.
- o During back shift, the SSSA will notify an off-duty health physics technician to report to the receiving hospital.

3.2.8 Implement EPP 1.5-2, Notification and Communication.

4.0 ATTACHMENTS

None

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-2, Notification and Communication.

MAY 3 1 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure
EPP 1.5-40

Post Accident Sampling of
Containment Atmosphere

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 5-31-82

1.0 OBJECTIVE

This procedure establishes the method by which containment atmosphere is remotely sampled following an accident.

2.0 LICENSE OR ADMINISTRATIVE REQUIREMENTS

2.1 Connecticut Yankee Technical Specifications, Section 6.0, Administrative Control (where applicable)

3.0 REFERENCES

3.1 NUREG 0578

3.2 NUREG 0737

3.3 General Dynamics Technical Manual for Containment Air Post Accident Sample System.

3.4 NUSCO Drawing No. 16103-26057, P&ID-Post Accident Sample System.

3.5 NUSCO Drawing No. 16103-29436, Sheet 3-PASS Schematic - Containment Air.

4.0 PREREQUISITIES

4.1 Adequate Nitrogen supply regulated to a maximum of 1800 PSIG.

4.2 Communication between Chemistry Lab, Service Building Sample Room.

4.3 Primary Auxiliary Building Ventilation System is in operation.

4.4 Radiation Work Permit issued and Health Physics coverage established for personnel retrieving sample.

4.5 Duty Officer informed and permission granted to operate sample panel.

5.0 PRECAUTIONS

5.1 If PAB ventilation is not operational, consider removing the blowerfuse at the remote operating module, thereby avoiding potential discharges out of the area ventilation exhaust ducting.

5.2 Post expected radiation boundaries prior to sampling and monitor radiation levels in the sample area prior to entry and during sample retrieval.

6.0 PROCEDURE — Initials

6.1 Preparation for sampling

6.1.1 Record data on Attachment B during remote module operation _____

6.1.2 Unlock and open the anti-tamper cover on the REMOTE OPERATING MODULE (Chemistry Lab). _____

6.1.3 Sample module area (Service Building Sample Room). _____

6.1.3.1 Place sample transfer containers and syringes in a convenient location.

6.1.3.2 Open the SAMPLE MODULE door and check the septum isolation valve (V-3) shut (handle perpendicular to needle guide). Leave door closed but catches loose to facilitate quick opening of door when retrieving samples. _____

6.1.4 Charge Nitrogen Flask

6.1.4.1 Shut V-5, Open V-4. Crack open V-6 admitting nitrogen to the flask. When pressure equalizes, fully open V-6. Caution: DO NOT pressurize flask above 1800 psig. _____

6.1.4.2 Back off the nitrogen pressure regulator until 0 psig is indicated on the NITROGEN REGULATED PRESSURE gauge. _____

6.1.5 Reset timer to zero minutes. _____

6.1.6 Energize the module by pressing the POWER ON switch. Allow a 15 minute warm-up period for the flowmeter. _____

6.1.7 Adjust the NITROGEN PRESSURE REGULATOR to 80 psig. _____

6.1.8 Position valves as follows:
V-1 Open _____ V-10 off _____
V-2 Sample ____ V-11 off _____ _____

6.1.9 Verify the LINE FUSE and BLOWER FUSE blown fuse indicator lights are not lit. If lit, refer to reference 3.3 section 4.0. _____

Initials

6.2 Capturing the Sample

6.2.1 Align a sample path from containment

6.2.1.1 Open SS-SOV-172 _____

6.2.1.2 Control open SS-SOV-150A and SS-SOV-150B _____

OR

Open SS-SOV-151A and SS-SOV-151B _____

6.2.2 Align a return path to containment

6.2.2.1 Open SS-SOV-171 _____

6.2.2.2 Control open SS-SOV-150C and SS-SOV-150D _____

OR

Open SS-SOV-151C and SS-SOV-151D _____

6.2.3 Position SS-MOV-174 to sample influent. _____

6.2.4 Start containment atmosphere sample compressor, C-17. The flowmeter should indicate that flow is initiated. _____

6.2.5 After three minutes, position V-1 to close. Flowmeter indication should be significantly less than noted in section 6.2.4. _____

6.2.6 After one minute, position V-2 to BYPASS and FLUSH. The sample is now isolated. _____

6.2.7 Record containment pressure on line 1 of Attachment B and heat trace temperature on line 2. _____

6.2.8 Secure containment air flow by positioning SS-MOV-174 to OFF AND securing compressor C-17. (flowmeter reading should drop to zero). _____

6.2.9 Nitrogen Purge of Sample Module

6.2.9.1 Position SS-MOV-174 to NITROGEN FLUSH, V-1 to open, V-10 to on. _____

Initials

6.2.9.2 Start compressor C-17. A high rate of flow should be indicated on the flowmeter. _____

6.2.9.3 After three minutes, position V-1 to closed. The flowmeter indication should be less than noted in 6.2.9.2. _____

6.2.9.4 After a second three minute interval, secure compressor C-17, position V-10 to OFF, SS-MOV-174 to OFF, and V-1 to open. _____

6.3 Sample Retrieval

6.3.1 Calculate the sample size to be removed using the method given in Attachment B. _____

6.3.2 Review reference Attachment A, sample retrieval scenario, to familiarize yourself with time sequences and expected radiation doses. _____

6.3.3 Enter SAMPLE MODULE area. Perform a rapid radiation survey to insure radiation levels are low enough to allow access. _____

6.3.4 Check syringe valves are open (needle screwed up against body). _____

6.3.5 Open sample module door. _____

6.3.6 Open septum isolation valve V-3 (Line-up handle with needle guide). _____

6.3.7 Insert syringe needle into needle guide, piercing septum and engaging needle nut into needle guide slot. _____

6.3.8 Draw the required aliquot of gas (per Attachment B) for containment hydrogen analysis into the syringe and lock the sample in the syringe by closing the valve on the syringe. This is accomplished by turning the syringe two turns in the counter clockwise direction.

CAUTION: Do not rotate syringe lock more than two turns from the syringe body. Excessive turns will disengage lock nut and needle from syringe. _____

Initials

6.3.9 Withdraw syringe from needle guide, close V-3. _____

6.3.10 Place syringe in transfer container. Close and lock transfer container. _____

6.3.11 Repeat steps 6.3.6 through 6.3.9 for the aliquot of gas required (per Attachment B) for radiation spectrum analysis. _____

6.3.12 Inject sample into transfer container for rad spectrum analysis. _____

6.3.13 Close and latch the SAMPLE MODULE door. _____

6.3.14 Exit sample area with transfer containers. _____

6.4 Restore System For Future Sampling

6.4.1 Purge Sample Chamber

6.4.1.1 Position SS-MOV-174 to NITROGEN FLUSH, V-1 to OPEN, V-10 to ON, V-2 to SAMPLE. _____

6.4.1.2 Start compressor C-17. _____

6.4.1.3 After three minutes, position V-1 to closed. _____

6.4.1.4 After a second three minute period, secure compressor C-17, position V-10 to OFF, SS-MOV-174 to OFF, and V-1 to OPEN. _____

6.4.2 Control secure sample and return lines by closing or checking closed SS-SOV-150A,B,C,D and SS-SOV-151A,B,C,D. _____

6.4.3 Back off the Nitrogen pressure regulator so the regulated pressure is zero. _____

6.4.4 De-energize the containment air sample modules by depressing the remote operating module "power on" button. _____

6.4.5 Close and lock the anti-tamper cover on the remote operating module. _____

7.0 CHECKOFF

Sample Taken By:_____
Chemistry Techician

Reviewed By:_____
Chemistry Supervisor

APPENDIX A

MAY 3 1 1982

RADIOLOGICAL ASSESSMENT - RETRIEVAL OF SAMPLES

A.1 EXPOSURE ESTIMATE TO OBTAIN CONTAINMENT AIR SAMPLES

A.1.1 ASSUMPTIONS

a. Stainless steel sample chamber is as shown in figures A1 and A2. (Reference 3.3).

b. Rad levels per figures A1 and A2 based on containment air radiation levels of 12.8 R/HR/CC at 2" (worst case Millstone Point, Unit 1).

c. Exposure to hand occurs at reference plane A of figures A1 and A2, using sample chamber as source and 1" from sample in syringe (extremity dose).

d. Exposure to whole body occurs 12" away from plane A of figures A1 and A2 (whole body dose).

e. Sample volume withdrawn is 100 ul for containment hydrogen (H_2) analysis which remains in syringe and the syringe placed in the shielded transfer container.

f. Sample volume withdrawn is 10 ul for rad analysis which is withdrawn by syringe and the sample injected into the shielded vial.

g. Extremity exposure assumes hand at reference plane A of figures A1 and A2 for 30 seconds, and 1" from source in syringe for 30 seconds for each sample.

A.1.2 SAMPLING SCENARIO

a.	Enter room and open sample cabinet door	15 seconds
b.	Open sample chamber valve, insert needle into sample chamber, and draw 100 ul sample into syringe (for Containment analysis).	30 seconds
c.	Withdraw syringe with 100 ul sample and place syringe in shielded transfer container.	30 seconds
d.	Using another syringe, insert needle into sample chamber and draw 10 ul sample into syringe (for rad analysis).	30 seconds
e.	Withdraw syringe with 10 ul sample, inject sample into shielded vial, and shut sample valve.	30 seconds
f.	Close sample cabinet door and exit room.	15 seconds

MAY 3 1 1982

A.1.3 WHOLE BODY DOSE

Sources are identified by number on figure A1. For whole body exposure estimate, the shielding for the 8.5 cc source must be changed from 2" Fe to 1" Fe due to the geometry of sample chamber. Shielding factors used in these calculations are .45 for 1-1/2" Fe and .56 for 1" Fe. Exposure occurs 12" from plane A.

a. Source 1 $.33cc \times 12.8\ R/HR/cc \times \left[\frac{2"}{17.25"}\right]^2 \times .45 = 26\ mR/HR$

b. Source 2 $8.5cc \times 12.8\ R/HR/cc \times \left[\frac{2"}{16.25"}\right]^2 \times .56 = 923\ mR/HR$

c. Source 3 $.2cc \times 12.8\ R/HR/cc \times \left[\frac{2"}{15.25"}\right]^2 \times .56 = 25\ mR/HR$

d. Source 4 $1cc \times 12.8\ R/HR/cc \times \left[\frac{2"}{14.5"}\right]^2 \times .56 = 136\ mR/HR$

e. Source 5 $.35cc \times 12.8\ R/HR/cc \times \left[\frac{2"}{14.5"}\right]^2 \times .56 = 48\ mR/HR$

f. 1/8" Lines as source (figure A2). Assume avg 1500 mR at 4":

$1500\ \frac{mR}{HR}$ at 4": $1500\ \frac{mR}{HR} \times \left[\frac{4}{16}\right]^2 = 94\ mR/HR$

g. Dose Rate for items a. through f., above = 1252 mR/HR

h. Dose Rate for 10 and 100 ul samples in syringe at 12":

$.11cc \times 12.8\ R/HR/cc \times 1\ min \times \frac{1\ HR}{60\ min} \times \left[\frac{2"}{12"}\right]^2 \approx 0\ mR/HR$

i. Total Dose to Whole Body

Assumes body is 12" from plane A for 30 seconds for each of two samples plus 15 seconds to open and 15 seconds to close sample cabinet door.

$1252\ \frac{mR}{HR} \times 1\text{-}1/2\ min \times \frac{1\ HR}{60\ min} = 31.3\ mRem$

MAY 3 1 1982

A.I.4 EXTREMITY DOSE

a. Dose Rate at cabinet door latches

Assume hand is 12" from plane A; Dose Rate is equal to Dose Rate used to calculate whole body exposure.

Dose Rate = 1252 mR/HR

b. Dose Rate at Plane A

$13.4 \frac{R}{HR}$ (figure A1) + $1.5 \frac{R}{HR}$ (figure A2) = 14.9 R/HR

c. Dose Rate at Syringe

12.8 R/HR/cc x .110 cc x = 5.63 R/HR

d. Total Extremity Dose to Hand

Assumes hand is exposed 30 seconds total at cabinet door latch, 1 minute total at plane A, and 1 minute total at syringe to take both samples.

$$\text{Dose} = 1252 \frac{mR}{HR} \times \times \frac{1}{2 \text{ min}} + 14.9 \text{ R/HR} \times 1 \text{ min} \times \frac{1 \text{ HR}}{60 \text{ min}}$$

$$+ 5.63 \text{ R/HR} \times 1 \text{ min} \times \frac{1 \text{ HR}}{60 \text{ min}} = .352 \text{ Rem}$$

= 352 mRem

A.1.5 SUMMARY

a. Whole Body Exposure = 31 mRem

b. Extremity Exposure = 352 mRem

APPENDIX B

MAY 3 1 1982

CALCULATION OF SAMPLE VOLUME TO BE RETRIEVED

B.1 RECORD:

a. Pressure of Trapped Sample (P) = _____ Psig.

b. Temperature of Trapped Sample (T) = _____ °F

B.2 CALCULATE:

a. Pressure Correction Factor (Pcf) $= \frac{14.7}{14.7 + P_1} =$ _____

b. Temperature Correction Factor (Tcf) $= \frac{460 + T_1}{492} =$ _____

c. Volume of sample to be drawn for hydrogen analysis to obtain 100 ul @ STP:

Vol. H = 100 ul x Pcf x Tcf

= 100 x _____ x _____ = _____ ul

d. Volume of sample to be drawn for rad analysis to obtain 10ul @ STP:

Vol. RAD = 10ul x Pcf x Tcf

= 10 x _____ x _____ = _____ ul

JUL 15 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-27

MANAGER OF ON-SITE RESOURCES

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 7-15-82

1.0 PURPOSE

This procedure establishes the emergency response-actions of the Manager of On-Site Resources.

2.0 RESPONSIBILITY

2.1 The Manager of On-Site Resources is responsible for ensuring 24-hour per-day planning for human and material resources during the course of the emergency.

2.2 The Manager of On-Site Resources reports directly to the Director of Station Emergency Operations.

3.0 ACTIONS

3.1 Immediate Actions.
(within 30 minutes of arrival at EOF)

3.1.1 Obtain Manager's log book and manual and maintain a log of all calls received and messages transmitted.

3.1.2 Notify Director of SEO of your presence in the EOC.

3.1.3 Record names and classifications of all CY personnel entering the Resource Center on Attachment 1.

3.1.4 Verify that on-call electrician, mechanic, I&C specialist, and health physics technician have arrived at Operations Support Center.

3.1.5 Inform Manager of Radiological Assessment and Dose Assessment of presence of emergency team at Operations Support Center.

JUL 15 1982

3.2 Subsequent Actions.

3.2.1 Determine the need to retain personnel for emergency assignment.

3.2.2 If conditions indicate emergency conditions will last more than 12 hours, organize shifts to fill all positions in the emergency organization. Maintain a pool of resource personnel based on your assessment of station needs.

3.2.3 If requested, call in additional station employees using emergency call list.

3.2.4 Coordinate requests by the Director of Station Emergency Operations which may include:

- o Food
- o Transportation
- o Personnel
- o Equipment
- o Telephones
- o Supplies

3.2.5 Request additional personnel, equipment, and supplies from the Corporate Manager of Resources as required.

3.2.6 Provide qualified personnel for search and rescue and/or first aid upon request.

3.2.7 Provide personnel to staff reentry and recovery teams.

4.0 ATTACHMENTS

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-11 Personnel Injuries.

5.2 EPP 1.5-15 Search and Rescue.

5.3 EPP 1.5-20, Reentry and Recovery.

ATTACHMENT 1

PERSONNEL ACCOUNTABILITY AND CLASSIFICATION

NAME	CLASSIFICATION

JUL 15 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-28

MANAGER OF TECHNICAL SUPPORT

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 7-15-82

1.0 PURPOSE

This procedure establishes the emergency-response actions of the Manager of Technical Support.

2.0 RESPONSIBILITY

2.1 The Manager of Technical Support is responsible for:

- o analyzing operating data,
- o making recommendations, and
- o providing technical support to the Manager of Control Room Operations.

2.2 The Manager of Technical Support reports directly to the Director of Station Emergency Operation.

3.0 ACTIONS

3.1 Immediate Actions.
(within 30 minutes of arrival at Technical Support Center (TSC)

3.1.1 Obtain Manager's log book and manual and maintain a log of all calls received and messages transmitted.

3.1.2 Notify the Manager of Control Room Operations of your presence in the TSC.

3.1.3 Notify the Director of SEO of your presence in the TSC.

3.1.4 Verify that all dedicated communication lines are operable.

JUL 15 1992

3.1.5 Ensure accountability check of all personnel responding to the Technical Support Center.

3.1.5.1 Record badge numbers and name.

3.1.5.2 Report the results to the Manager of Security.

3.2 Subsequent Actions

3.2.1 As the emergency condition warrents, request additional engineering assistance via the call list.

3.2.1.1 Electrical Engineers

3.2.1.2 Reactor Engineer

3.2.1.3 Mechanical Engineer

NOTE: All calls for assistance will be made by the Manager of Onsite Resources at the request of the Manager of Technical Support once the EOF is activated. Priot to activation the SSSA will make all required calls.

3.2.2 Establish communications via the dedicated phone with the Technical Support group at the Corporate EOC.

3.2.3 Analyze operating data and provide technical support to the Manager of Control Room Operations.

3.2.4 Analyze core/thermal hydraulic, electrical, and mechanical conditions to determine the cause of the plant emergency and recommend corrective actions.

3.2.5 Analyze reactor-system and control problems and determine available operating alternatives.

3.2.6 Design and coordinate installation of short-term instrument and control modification.

4.0 ATTACHMENTS

None

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-24, Manager of Communications.

5.2 EPP 1.5-26, Manager of Control Room Operations.

5.3 EPP 1.5-27, Manager of On-Site Resources.

5.4 EPP 1.5-33, Shift Supervisors Staff Assistant.

JUL 15 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-33

SHIFT SUPERVISOR'S STAFF ASSISTANT

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 7-15-82

1.0 PURPOSE

To provide guidelines for the activation and operation of radio-pager incident notification equipment.

2.0 RESPONSIBILITY

2.1 The Operations Supervisor shall ensure that qualified personnel are assigned to operate the radio-pager equipment at all times.

2.2 The Shift Supervisor's Staff Aseistant (SSSA) is responsible for operating the equipment in accordance with this procedure.

3.0 ACTIONS

3.1 The SSSA when first coming on-shift will insure that the equipment, unless in use, is in the following conditions:

3.1.1 Top three code-a-phones are recorded with the following message:

"This is the Haddam Neck Office. At the tone leave your name, emergency function and estimated time of arrival.

3.1.2 Record the lower fifteen (15) code-a-phones with the following message:

"This is the Haddam Neck Office. Please call the Business Office during regular working hours".

3.1.3 Place all eighteen (18) code-a-phones in the answer only position.

3.2 SSSA actions for Golf, Fox or Echo incident classification. JUL 15 1982

3.2.1 Attempt to notify the Duty Officer via commercial telephone.

3.2.2 Complete Incident Report Form using the following guidelines:

- o Complete all applicable information on the incident report form.
- o Use only the number of lines provided for event description.
- o Do not use abbreviations.
- o Do not use technical jargon.
- o Information on the form should be written in laymans language (preferably 6th grade level).
- o Dictate into the recorder at a speed that would allow individuals to write down the supplied information.
- o Speed can be increased for circling words or single words.
- o State two (2) to three (3) words and pause with a slow mental count of five.

3.2.3 Erase and reset to zero each message recording tape.

3.2.4 Record the incident report on the 15 lower code-a-phones using the programmer and place in the ANSWER RECORD POSITION.

3.2.5 Place the level selector toggle switch in the level 1 position at the centre com. (Refer to Attachment 1)

3.2.6 Select the appropriate tape from the tape file which corresponds to the incident being reported and place in tape slot.

3.2.6.1 Twenty prepared 10 second messages are available for each station.

3.2.6.2 Seven blank tapes and a tape recorder is available for other contingencies.

JUL 15 1982

3.2.7 Adjust the volume control on the select audio speaker to 3/4 position.

3.2.8 Press the Red Alert button on the Auto Page Section.

Note: Insure the busy lights are not lit on the paging transmit/receive modules. If the busy lights are lit, wait until they are out before pressing the red alert button.

3.2.9 Monitor tape by listening to the select audio speaker for proper tape selection.

3.2.9.1 If tape is incorrect, press the white reset button to stop the auto pager.

3.2.9.2 If tape is correct, monitor each paging transmit/receive module for activation.

3.2.10 After each of the four paging transmit/receive modules have been activated, remove the tape from the tape slot and replace in the file.

3.2.11 Within 30 minutes review the tape recorders to assure all level one radio-page personnel have responded.

Note: If State DEP does not respond to page within the hour, call the 24 hour number at the DEP office.

3.2.12 If radio-pager system is inoperable use the Notification Guide in EPP 1.5-2.

3.2.13 Leave telephone call-back recorder information on machines for at least one hour after radio-pager is initiated.

3.2.14 After 60 min, reset telephone call-back recorder to be ready to record a new incident report message.

Note: Do not send page until telephone recorder banks are programmed.

3.2.15 Mail copies of the Incident Report on a daily basis (within one working day) to Manager, Radiological Assessment Branch and Nuclear Emergency Planning Coordinator at the Corporate Office. The original shall be forwarded to the Station Superintendents secretary and a copy made for the SSSAs book.

3.3 SSSA actions for Delta, Charlie-One, Charlie-Two, Alpha or Bravo incident classification.

3.3.1 Attempt to notify the Duty Officer via commercial telephone.

3.3.2 Complete Incident Report form using the guidelines stated in Section 3.2.2 (Refer to EPP 1.5-2)

3.3.3 Erase and reset to zero each message recording tape.

3.3.4 Place the top three code-a-phones in the answer record position.

3.3.5 Record the incident report message on the 15 lower code-a-phones using the programmer and place in the answer record position.

3.3.6 Place the level select toggle switch in the Level 2 position at the Centre Com. (Refer to Attachment 1).

3.3.7 Select the appropriate tape from the tape file which corresponds to the incident being reported and place in tape slot.

3.3.7.1 Twenty prepared 10 second messages are available for each station.

3.3.7.2 Seven blank tapes and a tape recorder are available for other contingencies.

3.3.8 Adjust the volume control on the select audio speaker to 3/4 position.

3.3.9 Press the Red Alert button on the Auto Pager Section.

Note: Insure the busy lights are not lit on the paging transmit/receive modules. If the busy lights are lit, wait.

3.3.10 Monitor the tape by listening to the select audio speaker for proper tape selection.

3.3.10.1 If the tape is incorrect, press the white reset button to stop the auto pager.

3.3.10.2 If the tape is correct, monitor each paging transmit/receive module for activation.

JUL 15 1982

3.3.11 After each of the four paging transmit/receive modules has been activated, remove the tape from the tape slot and replace it in the file.

3.3.12 Complete the Checklist for Notification of Significant Events (Refer to EPP 1.5-2) and notify the NRC via dedicated line.

Note: All applicable information should be completed on the checklist prior to initiating the call.

3.3.13 Within 30 minutes review the tape recorders to assure all level two radio-pager personnel have responded.

3.3.13.1 Attempt to contact towns not responding to radio-page via commercial telephone. (Refer to EPP 1.5-2)

3.3.13.2 Request assistance from the appropriate state police barracks for non responding towns. (Refer to Attachment 4)

Note: Call-back verification for the top three code-a-phones need not be checked for state class Delta.

3.3.14 Change messages on recorder every 30-60 minutes as necessary or upon incident classification change.

Note: The system has the capability to be used for 15 minute updates if incident class changes that rapidly.

3.3.15 If follow-up messages are planned, read the message into the 15 code-a-phones using the programmer. Verification of information is not required.

3.3.16 If follow-up is a change in incident classification, call-back verification is required.

3.3.17 After call-back verification has been completed and no follow-up messages are planned, restore the equipment to the condition described in step 3.1.

3.3.18 Mail copies of the incident reports on a daily basis (within one working day) to Manager, Radiological Assessment Branch and Nuclear Emergency Planning Coordinator at the Corporate Office. The original shall be forwarded to the Station Superintendents secretary and a copy made for the SSSAs book.

3.4 Individual page (refer to Attachment 2) in the event of an emergency can be accomplished via the following:

3.4.1 Select proper pager number desired by push button pad on the pager encoder.

3.4.2 Select the proper transmit module the desired call is to go out on (green button) assuring the desired module is not in use.

- o Chapel Hill
- o South Mtn.
- o Talcott Mtn.
- o Goose Hill

3.4.3 Push the call button on encoder push button pad to send the page, observing the illumination of the call lamp.

3.4.4 The call lamp will go out and the talk lamp will light green.

3.4.5 Depress the transmit (call) button on the CVS module giving the voice message while the green light is illuminated.

3.4.6 To cancel a page call, push the reset switch on the encoders push button pad.

3.4.7 A complete list of all individual page numbers are included in Attachment 3.

3.5 Radio-Pager Testing

3.5.1 The Level Two radio-pager system will be tested daily using the following schedule.

- o Tuesday, Thursday, Saturday 11 A.M.
- o Monday, Wednesday, Friday 7 P.M.

Note: Daily tests will be conducted within five minutes of the designated times.

3.5.2 A monthly communication check of the Level 2 radio-pager and call-back verification will be conducted.

3.5.2.1 The first Wednesday of each month is designated as the test day.

JUL 15 1982

3.5.2.2 If a public holiday is on the first Wednesday, the drill will be conducted on Thursday.

3.5.2.3 The drill will be conducted at 2:00 P.M.

3.5.2.4 A prerecorded radio-pager message for a delta drill will be used. (Attachment 5)

3.5.2.5 The Radiological Assessment Branch will provide the text for the event description section of the incident report.

3.5.3 Contact Reggie Rodgers or Larry Sheehan prior to the transmission of any radio-pager message excluding scheduled tests or a real emergency.

3.6 If the Nurse is required for an emergency and cannot be reached by telephone, manual page can be initiated. (This can only be accomplished when the Nurse is onsite.

3.6.1 Depress the green Select button on Goose Hill transmit/receive unit.

3.6.2 Depress on page encoder, then press the call button.

3.6.3 When green talk light comes on, depress transmitter switch (red) or right side front treadle and send message.

3.6.4 When message is complete, depress reset button on paging encoder.

3.7 The SSSA will request, via the emergency call list, engineering assistance as deemed necessary by the Manager of Technical Support/STA.

NOTE: The responsibility for emergency call ins will become the Manager of Onsite Resources once the EOF is activated.

3.8 For Radio-pager System Service call during the day. All other times, Convex and

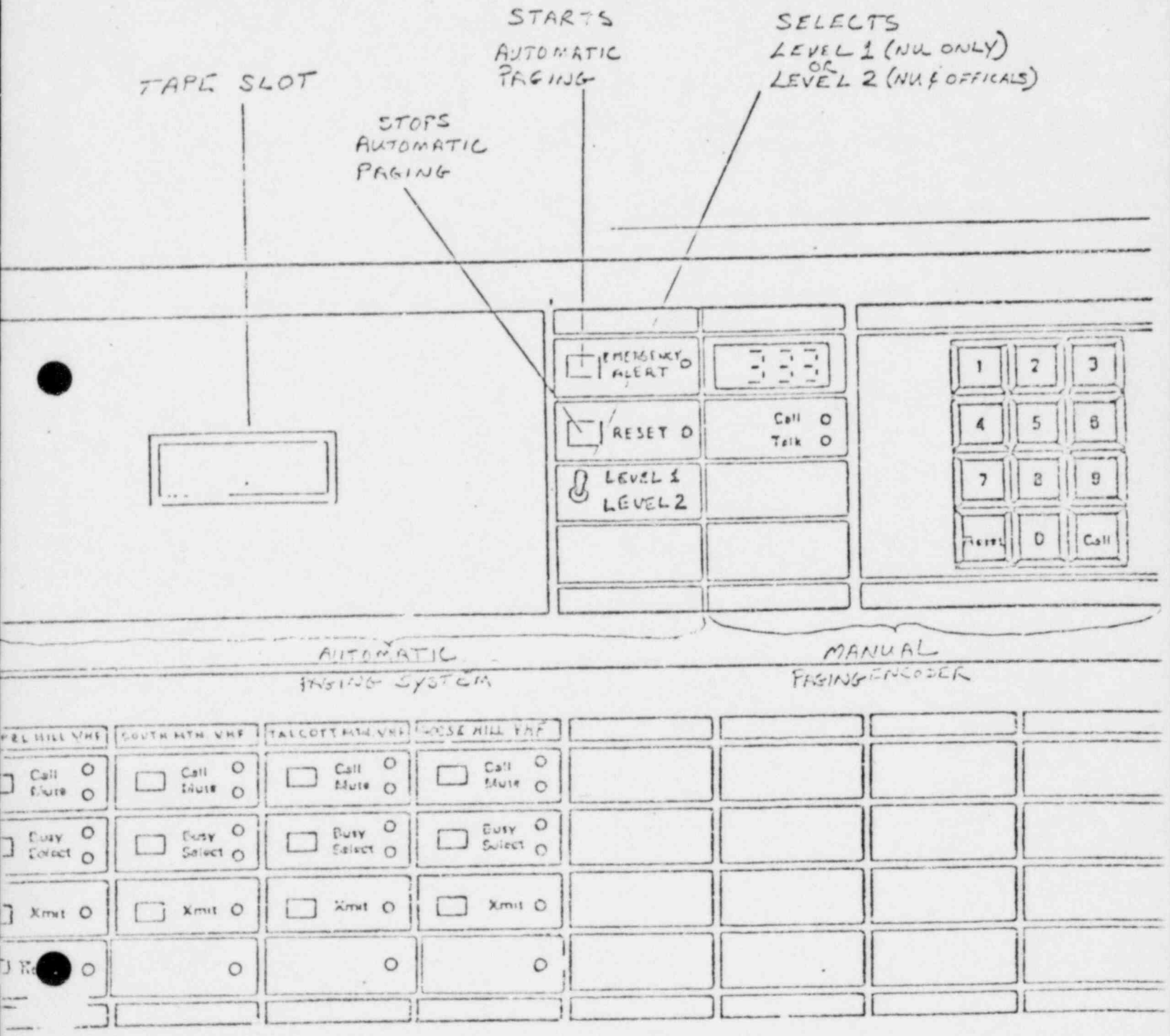
4.0 ATTACHMENTS

	TITLE	PAGE
1	Auto Page Console Diagram	
2	Manual Page Console Diagram	
3	List of Individual Page Numbers	
4	Connecticut State Police (CSP) Contact Points	
5	Delta Drill Radio-pager Message	

5.0 PROCEDURE CROSS REFERENCE

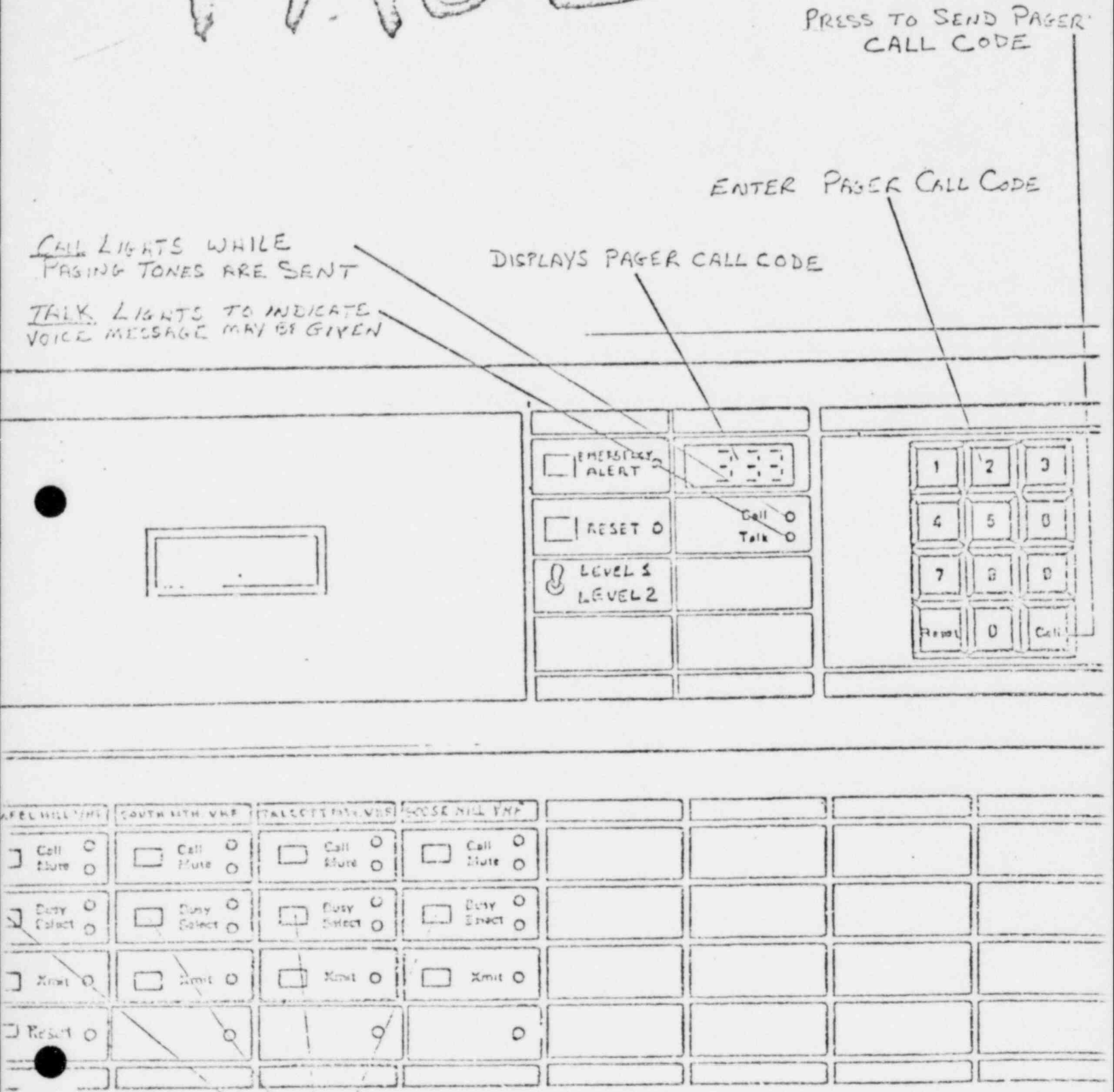
5.1 EPP 1.5-2, Notification and Communication.

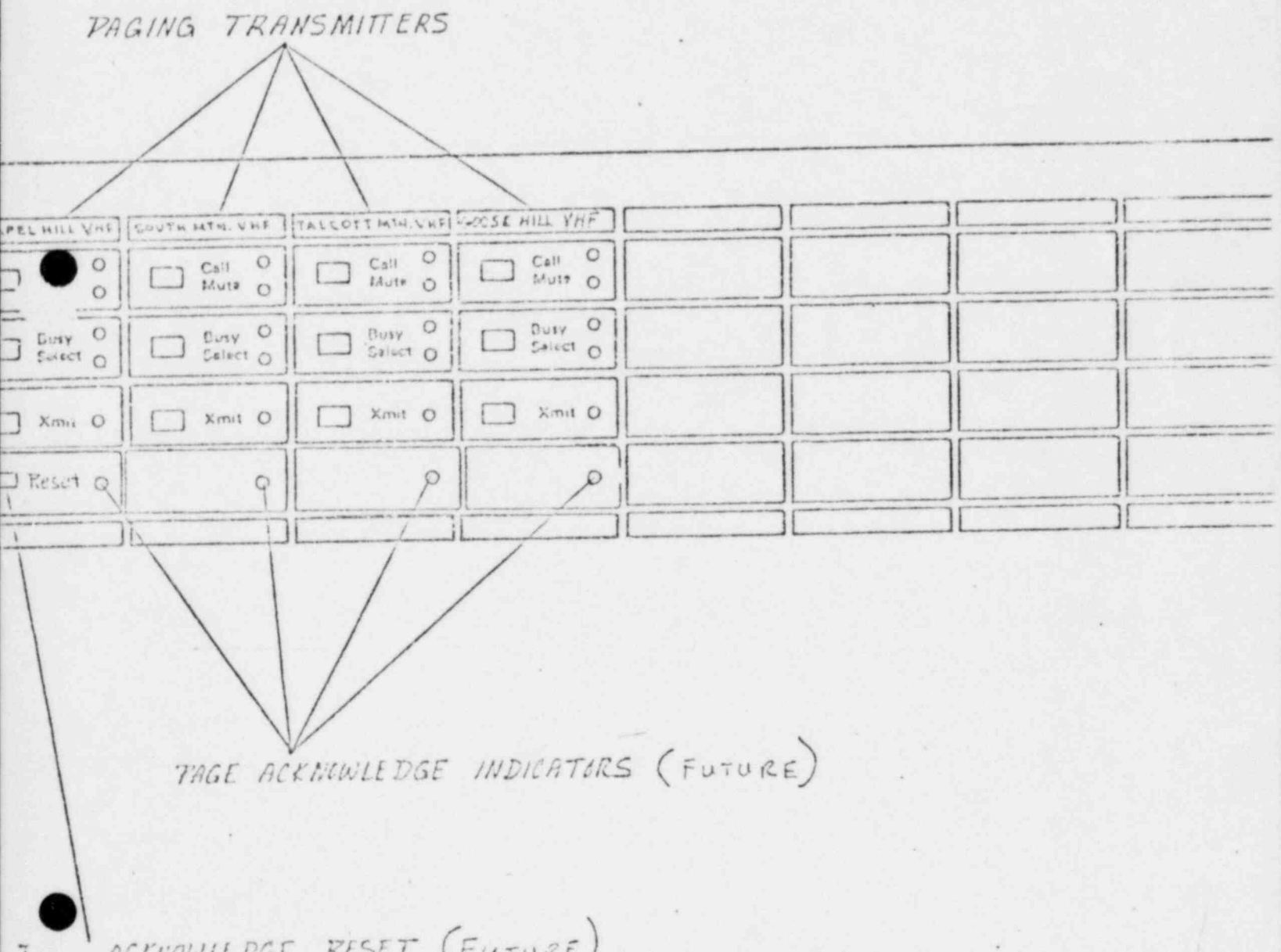
AUTO-PAGE


TAPE SLOT
STARTS AUTOMATIC PAGING
STOPS AUTOMATIC PAGING
SELECTS LEVEL 1 (NUL ONLY) OR LEVEL 2 (NUL & OFFICALS)
EMERGENCY ALERT
RESET
LEVEL 1
LEVEL 2
Call
Talk
1
2
3
4
5
6
7
8
9
0
Call
AUTOMATIC PAGING SYSTEM
MANUAL PAGING ENCODER
Call Mute
Busy Select
Xmit

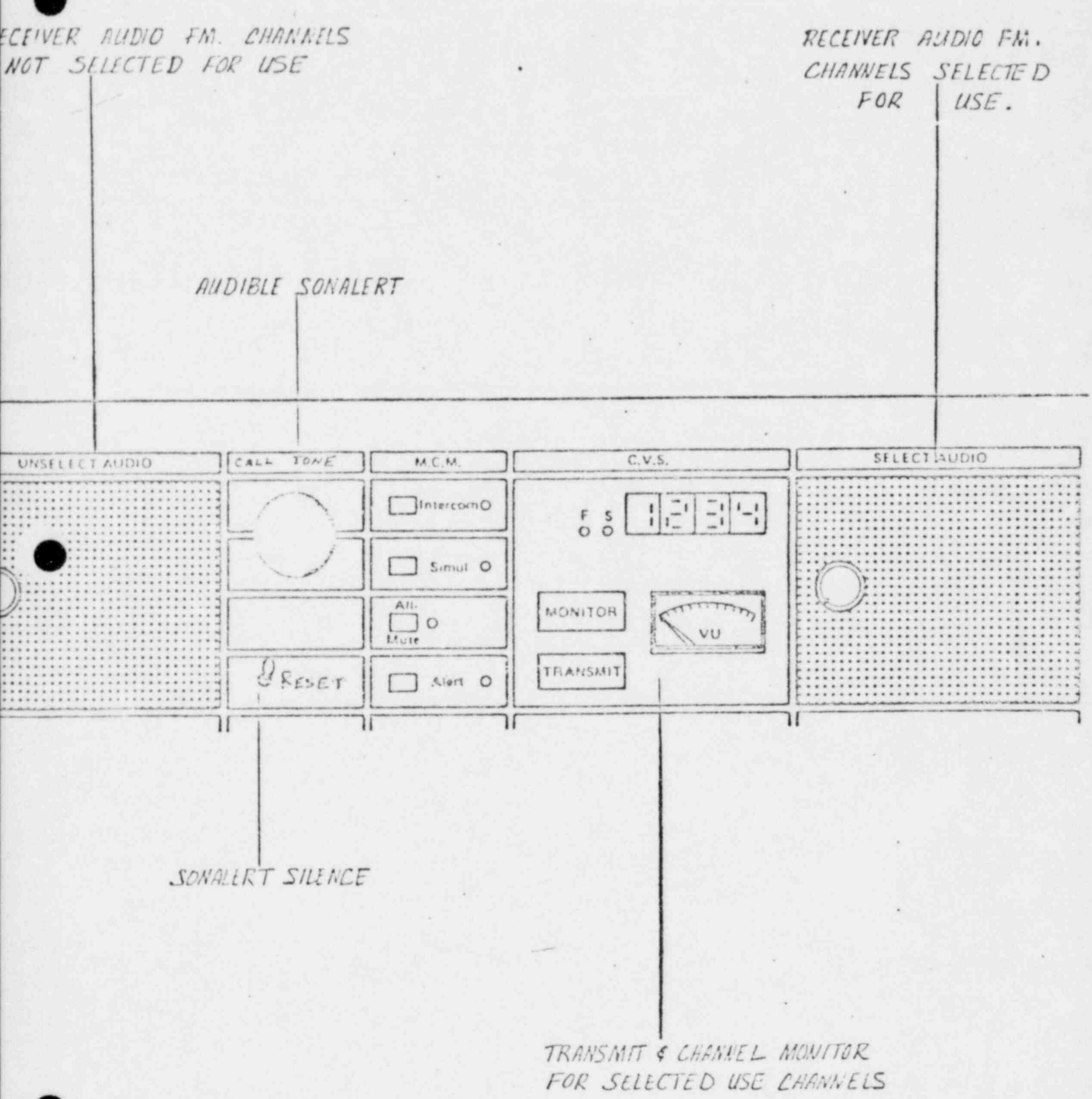
JUL 15 1982

MANUAL PAGE




PAGING TRANSMITTERS
PEL HILL VHF
SOUTH MTN. VHF
TALCOTT MTN. VHF
GOOSE HILL VHF
Call Mute
Busy Select
Xmit
Reset
PAGE ACKNOWLEDGE INDICATORS (FUTURE)
7
ACKNOWLEDGE RESET (FUTURE)

JUL 15 1982


RECEIVER AUDIO FM. CHANNELS NOT SELECTED FOR USE
RECEIVER AUDIO FM. CHANNELS SELECTED FOR USE.
AUDIBLE SONALERT
UNSELECT AUDIO
CALL TONE
M.C.M.
C.V.S.
SELECT AUDIO
Intercom
Simul
All-Mute
Alert
RESET
F S
1 2 3 4
MONITOR
VU
TRANSMIT
SONALERT SILENCE
TRANSMIT & CHANNEL MONITOR FOR SELECTED USE CHANNELS

ATTACHMENT 3

Group O

NUSCo Level 1

Name or Title	Individual Code/Group Code
L. F. Sillin	
W. B. Ellis	
W. F. Fee	
W. G. Counsil	
J. P. Cagnetta	
J. F. Opeka	
T. J. Dente	
State D.E.P.	
NUSCo Nuclear Operations Duty Officer	
NUSCo Public Affairs Duty Officer	
Nuclear Emergency Planning Coordinator	
Chief, Radiological Assessment Branch	

JUL 15 1982

ATTACHMENT 3

Group 1

NUSCo level 2

Name or Title	Individual Code/Group Code
Director, Corporate Emergency Operations Center	
Manager, External Communications	
Manager, Technical Support	
Electrical Engineering Support Team	
Core Thermal/Hydraulic Engineering Support Team	
Mechanical Engineering Support Team	
Manager, Resources	
Manager, Radiological Consequences Assessment	
Meteorological Team	
Environmental Team	
Backup Public Affairs Duty Officer	

JUL 15 1982

ATTACHMENT 3

Group 2

Millstone Station Level 1

Name or Title	Individual Code/Group Code
Station Superintendent/D. J. Mroczka	
Unit One Superintendent/R. J. Herbert	
Unit Two Superintendent/J. J. Kelley	
Unit Three Superintendent/J. O. Crockett	
Station Services Superintendent/E. C. Farrell	
NRC Resident Inspector/ J. T. Shedlosky	
Unit One Duty Officer	
W. D. Romberg	
P. Mary	
J. P. Stetz	
R. J. Palmieri	
R. J. Przekop	
Unit Two Duty Officer	
S. E. Scace	
R. A. Place	
H. F. Haynes	
J. J. Heg	
P. W. Bates	
R. W. Rothgeb	
J. S. Keenan	

JUL 15 1992

ATTACHMENT 3

Group 3

Millstone Station Level 2

Name or Title	Individual Code/Group Code
Unit One Maintenance/W. L. Varney	
I&C/F. W. Teeple	
Engineering/R. J. Palmieri	
Relief Shift/W. D. Romberg	
Unit Two Maintenance/J. S. Keenan	
I&C/H. F. Haynes	
Engineering/R. A. Place	
Relief Shift/S. E. Scace	
Manager, Resources/R. A. Griswold	
Manager, Technical Support/V. Papadopoli	
Manager, External Communications/C. L. Gilbert	
Manager, Radiological Consequences Assessment/ A. G. Cheatham	
Manager, Security/H. H. Clark	
Stores/R. A. Griswold	
Records/J. A. Winn	
Emergency Plan H.P. Tech/A. G. Cheatham	
Emergency Plan Chem Tech/J. P. Kangley	
Computer Operations/C. P. Scopelitis	
Unit One Admin	
Unit Two Admin	

JUL 15 1982

ATTACHMENT 3

Group 4

Millstone Station Towns Level 2

Name or Title	Individual Code/Group Code
East Lyme	
Groton City	
Ledyard	
Montville	
New London	
Old Lyme	
Old Saybrook	
Groton Town	
Fishers Island	
Yaphank	
Plum Island	
Montville SP	
Waterford	

JUL 15 1992

Attachment 3

Group 5

Millstone and Connecticut Yankee Towns Level 2

Name or Title	Individual Code/Group Code
Lyme	
Hartford State Police	
Westbrook State Police	
State D.E.P.	
State Office of Civil Preparedness	
Meriden State Police	
Governor's Office	

JUL 15 1982

ATTACHMENT 3

Group 6

Connecticut Yankee Station Level 1

Name or Title	Individual Code/Group Code
Station Superintendent/R. H. Graves	
Unit Superintendent/J. H. Ferguson	
Station Services Superintendent/R. Z. Test	
Training Supervisor/S. T. Fleming	
Chemistry Supervisor/M. D. Quinn	
NRC Resident Inspector/T. H. Smith	

JUL 2 5 1982

ATTACHMENT 3

Group 7

Connecticut Yankee Station Level 2

Name or Title	Individual Code/Group Code
Manager, External Communications	
Manager, Resources	
Manager, Radiological Consequences Assessment	
Electrical Maintenance	
Mechanical Maintenance	
I&C Technicians	
HP Technicians	
QA	
Operations Supervisor/R. E. Brown	
Security Supervisor/G. R. Hallberg	

JUL 15 1982

ATTACHMENT 3

Group 8

Connecticut Yankee Towns Level 2

Name or Title	Individual Code/Group Code
Chester	
Colchester	
Deep River	
Durham	
East Haddam	
East Hampton	
Essex	
Haddam	
Hebron	
Killingworth	
Madison	
Marlborough	
Middlefield	
Middletown	
Portland	
Salem	
Westbrook	
Colchester State Police	

JUL 15 1982

Attachment 4

CONNECTICUT STATE POLICE (CSP) CONTACT POINTS

HADDAM NECK

Colchester CSP Barracks (Troop K)	Westbrook CSP Barracks (Troop F)
Via Hot Line	Via Telephone:
Colchester	Chester
East Haddam	Deep River
East Hampton	Durham
Hebron	Essex
Marlborough	Haddam
Portland	Killingworth
Salem	Lyme
	Madison
	Middlefield
	Middletown
	Westbrook

NOTE: This list is to be used AFTER Station attempt to contact local communities by telephone.

Attachment 5

Prerecorded Radiopager Message
For
Delta Drill

* This is the Haddam Neck Control

* This is a Drill

* A State of Connecticut Incident Class Delta is in progress

* This Is A Drill

* Call in for more information

EPP 1.5-39-C
Original

MAY 3 1 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure EPP 1.5-39

POST ACCIDENT SAMPLING OF REACTOR COOLANT

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 5-31-82

1.0 PURPOSE

The purpose of this procedure is to establish the method by which the reactor coolant is remotely sampled following an accident.

2.0 LICENSE OR ADMINISTRATIVE REQUIREMENTS

2.1 Connecticut Yankee Technical Specifications, Section 6.0, Administrative Control (where applicable).

3.0 REFERENCES

3.1 NUREG 0758.

3.2 NURE7 0737.

3.3 General Dynamics Technical Manual for Reactor Coolant Post Accident Sample System.

3.4 NUSCO Drawing No. 16103-26057, P&ID--Post Accident Sample System.

3.5 NUSCO Drawing No. 16103-29436, Sheet 2--PASS Schematic--Reactor Coolant.

4.0 PREREQUISITES

4.1 Adequate nitrogen supply regulated to a maximum of 1800 PSIG.

4.2 Communication established between Chemistry lab and Control Room.

MAY 3 1 1982

4.3 Primary Auxiliary Building Ventilation System is in operation.

4.4 Health Physics requirements established for personnel retrieving sample specified on the Radiation Work Permit.

4.5 Adequate deionized water supply for system flushing.

4.6 Deionized water flush module operational.

4.7 Component cooling supplied to drain header sample heat exchanger E-9-1A, if drain header is to be sampled.

4.8 All manual valves aligned to complete a flow path prior to sampling. Inproper alignment may cause a situation where accident coolant high radiation levels prevent access to an area necessary to reposition a valve.

4.9 Duty Officer informed and permission granted to operate sample panel.

5.0 PRECAUTIONS

5.1 If PAB ventilation is not operational, consider removing the blower fuse at the remote operating module, thereby avoiding potential discharges out of the area ventilation exhaust ducting.

5.2 Do not exceed 165°F as read on Temperature Indicator Channel T-1. The influent "high temperature" light will flash when this temperature limit is exceeded. If the temperature reaches this point, secure the sample flow to the SAMPLE MODULE immediately.

5.3 Do not open V-16 or V-17 except during flush operations or when reactor coolant pressures are 250 psig or less as damage to the pH probe may occur.

5.4 Do not exceed 2500 psig in the sample system as damage may occur to the components.

5.5 Valve V-18 must always be positioned to "LOW-FLOW" when system pressure is above 400 psig to prevent high pressure spikes due to water hammer.

5.6 Do not run the flush module pump dry for longer than five (5) minutes as damage to the pump may occur.

5.7 Post expected radiation boundaries prior to sampling and monitor radiation levels in the sample area prior to entry and during sample retrieval.

5.8 V-9 and V-14 must be closed at all times except when the syringe is inserted into the sample chamber.

6.0 PROCEDURE

6.1 Preparation for sampling

6.1.1 Obtain a copy of Attachment A on which data will be recorded. _____

6.1.2 Unlock and remove the Anti-tamper cover from the Remote Operating Module. _____

6.1.3 Energize the modules by pressing the power-on switch. Allow 15 minutes warm-up period for instrumentation. _____

6.1.4 Preparation of sample module area (service building sampling room). _____

6.1.4.1 Place sample transfer containers and syringes in a convenient location. _____

6.1.4.2 Check that the 2 ml removable grab sample container is installed and quick connects are engaged properly. _____

6.1.4.3 Check that the 2 ml removable grab sample container flexible hoses are connected to the valve operator. The blue ends on one set of quick-connects should be connected together. _____

6.1.4.4 Check that V-9 and V-14 (5 ml sample chamber sample valves) are closed. _____

MAY 3 1 1982

6.1.5 Charge Nitrogen Flask

6.1.5.1 Shut V-23. Open V-22. Crack open V-24 admitting nitrogen to the flask. When pressure equalize, fully open V-24. Caution: Do Not pressurize flask above 1800 PSIG. _____

6.1.5.2 Back off the nitrogen pressure regulator until 0 psig is indicated on the NITROGEN REGULATED PRESSURE guage. _____

6.1.6 Check that the temperature indicator switch is set to T-1. On the temperature readout instrument, ensure that the T-1 button is depressed and the T-2 button is not depressed. _____

6.1.7 Adjust the nitrogen pressure regulator to 80 PSIG. _____

6.1.8 Postion valves as follows:

V-1	BY-PASS _____	V-7	BY-PASS _____	V-15	CLOSED _____
V-2	GRAB _____	V-8	BY-PASS _____	V-16	CLOSED _____
V-3	SAMPLE _____	V-11	LIQUID _____	V-17	CLOSED _____
V-4	CLOSED _____	V-12	BY-PASS _____	V-18	LO-FLOW _____
V-6	CLOSED _____	V-13	BY-PASS _____		

_____

6.1.9 Align a Sample Return Path

6.1.9.1 To return to RHR open SS-SOV-164 (control) and SS-SOV-165 (PASS PANEL) _____

OR

6.1.9.2 To return to the VCT open SS-SOV-173 (control) and SS-SOV-166 (PASS PANEL) _____

CAUTION: It is imperative that all manual valves necessary to complete the sample flow path are properly positioned. Failure to do so may create a situation where high radiation levels of accident coolant prevents access to an area for repositioning a valve once coolant flow to the sample module has been initiated.

6.1.10 Fill the sample module gas loop as follows:

A. Position V-11 to GAS _____

B. Open V-15 _____

C. Position V-7 to INLINE _____

D. Open V-6 and wait 30 seconds _____

E. Position V-12 and V-13 to INLINE and wait 30 seconds _____

F. Position V-12 to BY-PASS _____

G. Position V-8 to INLINE and wait 30 seconds _____

H. Position V-7 and V-8 to BY-PASS and wait 30 seconds _____

I. Close V-15 _____

J. Position V-11 to LIQUID _____

K. Close V-6 _____

L. Position V-13 to BY-PASS _____

6.1.11 Align a sample supply line

6.1.11.1 Sample point downstream of drain header sample heat exchanger E-9-1A. Open SS-SOV-167 (PASS panel) and SS-FCV-950 (control room)

OR

6.1.11.2 From RHR system. Open SS-SOV-168 (PASS panel) and SS-SOV-169(control room) _____

6.1.12 Record totalizer meter reading on line 1 of Attachment A. _____

6.1.13 Initiate sample flow by positioning V-2 to BYPASS. Monitor flowmeter reading and radiation levels on the rad meter. When radiation levels increase markedly a representative sample is passing through the sample module. _____

6.2 Isolating the Grab Sample

6.2.1 Position V-1 and V-2 to the GRAB position (a reduction in flowrate should be evident). Allow approximately 30 seconds for flow to stabilize. _____

6.2.2 Pressurized GRAB sample

6.2.2.1 Position V-2 to BYPASS (flowrate should drop to zero) _____

6.2.2.2 Position V-3 to NORMAL and FLUSH. _____

OR

6.2.3 Depressurized GRAB sample

6.2.3.1 Position V-1 to BYPASS (flowrate should drop to zero) _____

6.2.3.2 Position V-3 to NORMAL and FLUSH _____

6.3 Inline samples (if required. If not go to Section 6.4)

6.3.1 Isolate reactor coolant in liquid loop as follows:

A. Position V-1 to GRAB and V-2 to BY-PASS Open V-4 and V-6. Monitor flow on the FLOWMETER. _____

B. After a 15 second wait, position V-7 and V-8 to INLINE _____

C. Wait 15 seconds and position V-8 to BY-PASS. _____

D. Start the pump and run for 15 seconds, then secure the pump. _____

E. Close V-6 and wait 10 seconds _____

F. Close V-4 _____

A pressurized sample of known volume is trapped within the boundaries of V-4, V-6 and V-11. _____

6.3.2 Isolate the sample supply line to the SAMPLE MODULE.

6.3.2.1 Sample point downstream of drain header sample cooler E-9-1A. Close SS-SOV-167 and SS-FCV-950. _____

OR

6.3.2.2 Sample from RHR system. Close SS-SOV-168 and SS-SOV-169. _____

6.3.3 Determine total dissolved gas as follows:

A. Note and record the pressure from the digital pressure readout. Enter reading on Line 2 of Attachment A. _____

B. Position V-12 to IN-LINE _____

C. Position V-11 to GAS, allowing the liquid loop to depressurize and dissipate released gas to the gas loop. _____

D. Position V-12 to BY-PASS _____

E. Position V-7 to BY-PASS _____

F. Start the PUMP. Allow it to run for one minute then stop the PUMP. _____

G. When pressure, as read on the digital pressure readout, stablizes (about 15 seconds) position valves V-7, V-8 V-12 and V-13 to IN-LINE. _____

H. Restart the PUMP. Allow it to run for one minute then stop the PUMP and allow pressure to stablize. Repeat this step two more times. _____

I. Position V-7, V-8, V-12 and V-13 to BY-PASS. _____

J. Note and record the pressure from the digital pressure readout. Enter the reading on line 3 of Attachment A. _____

K. Note and record the temperature T2 from the digital temperature readout. Enter the reading on line 4 of Attachment A. _____

Calculate total dissolved gas (TDG) per the calculation instructions of Attachment A. A sample of degassed liquid is now isolated in the liquid sample chamber and a sample of reactor coolant gas, mixed with nitrogen, is isolated in the gas sample chamber. _____

6.4 Flush Preparatory to Sample Retrieval

6.4.1 If valves are not in the following positions, reposition them.

V-1 BY-PASS _____	V-7 BY-PASS _____	V-15 CLOSED _____
V-2 GRAB _____	V-8 BY-PASS _____	V-16 CLOSED _____
V-3 NORMAL _____	V-11 LIQUID _____	V-17 CLOSED _____
V-4 CLOSED _____	V-12 BY-PASS _____	V-18 LO-FLOW _____
V-5 CLOSED _____	V-13 BY-PASS _____	

6.4.2 Align the flush moduel by opening SS-SOV-170. _____

6.4.3 Flush as follows:

A. Open V-4, V-16 and V-17 _____

B. Verify flow meter registers flow _____

C. Monitor and record on Attachment A-1 the pH reading and the temperature T-1 _____

D. Start the pump _____

E. Position V-18 to HI-FLOW _____

F. Continue flushing for 5 minutes. During the flush, cycle valves V-4, V-16, and V-17 at least 3 times to ensure all liquid is flushed from under the valve seats. Monitor flow and radiation levels to assess flush effectiveness. _____

G. Reposition valves as follows:

V-6 OPEN _____ _____

V-16 CLOSED _____ _____

V-17 CLOSED _____ _____

H. Continue flush for another 2 minutes. During this 2 minute period cycle V-6 at least 3 times to ensure all liquid is flushed from under the valve seats. _____

I. Position V-11 to GAS, continue flushing for two (2) minutes then secure the PUMP and CLOSE V-6. _____

J. Position V-2 to BY-PASS then position V-4 to CLOSED, continue flushing for 1 minute. _____

K. Reposition valves V-1 and V-2 to GRAB. Continue flushing for one (1) minute then secure the flush. _____

L. Monitor radiation levels as indicated on the Remote Module Radiation Detector Readout. If radiation - levels have not been reduced as desired, repeat the flush 6.4.1 thru 6.4.3, as often as required to reduce radiation to the desired level. _____

6.4.4 Isolate Sample Return path

6.4.4.1 Isolate return to RHR by closing SS-SOV-164 and SS-SOV-165. _____

OR

6.4.4.2 Isolate return to VCT by closing SS-SOV-166 and SS-SOV-173. _____

CAUTION: At this time, steps should be taken to ensure that isolation valves are closed and that they cannot be inadvertently operated while operator is retrieving samples.

6.5 GRAB Sample Retrieval

6.5.1 Review Attachment B and sample retrieval scenario in Appendix B-1 of reference 3.3 _____

6.5.2 Perform a rapid radiation survey to ensure radiation levels are within acceptable limits. _____

6.5.3 Place the sample transfer container and spare 2 ml sample chamber near the sample module. Remove the transfer container lid. _____

6.5.4 Retrive the GRAB Sample as follows:

A. Open the lower sample access door. _____

B. Grasp the unlatching knob and pull the grab sample tray assembly forward, outside the module. _____

C. Disconnect the flexible hoses from the grab sample valve operator. _____

D. Lift the grab sample chamber from the tray and place it in the transfer container. Place the lid on the transfer container. _____

E. Place the new grab sample chamber on the slide tray. Check that the sample chamber is located so that the quick connect collars are properly positioned in the yoke and the grab sample chamber is pressed firmly down onto the slide tray. _____

F. Connect the flexible hoses to the grab sample chamber air operator. Ensure the blue color coded quick-connects are mated. _____

G. Push the slide tray with grab sample chamber back into the cabinet until the liquid quick-connects latch. _____

H. Close the access door _____

I. Exit the area with the sample. _____

6.6 Inline Sample Retrieval

6.6.1 Review Attachment B and the Sample Retrieval scenario in Appendix B-1 of reference 3.3. _____

6.6.2 Perform a rapid radiation survey to ensure radiation levels are within acceptable limits. _____

6.6.3 Place transfer containers and syringes near the sample module. Remove transfer container lids. Check that syringes are open (needle nut tight against body) _____

6.6.4 Retrieve Depressurized Liquid Sample as follows:

A. Open the lower access door. _____

B. Gently insert the liquid sample syringe into the brass needle guide, bottoming the needle on the septum. _____

C. Open V-9 by gently pulling the valve handle out to its stop. _____

D. Complete insertion of the syringe needle into the brass needle guide until the syringe needle nut mates into the brass needle guide slot _____

E. Withdraw the required aliquot of liquid as determined from Attachment C, then lock the sample in the syringe by unscrewing the syringe body two turns. Use the red dots on the syringe as a reference to determine the two turns. _____

F. Withdraw the syringe carefully from needle guide and close V-9 by gently pushing the valve handle onto its stop. _____

G. Inject a portion of the liquid sample as determined by Attachment C into the shielded vial for Rad Analysis. (Open and close syringe). Place syringe with remaining liquid sample into transfer container for chloride analysis. _____

H. Place shield tops on transfer containers. _____

I. Close lower sample access door. _____

6.6.5 Retrieve a gaseous sample as follows:

A. Open the upper access door. _____

B. Gently insert gas sample syringe into the brass needle guide, bottoming the needle on the septum. _____

C. Open V-14 by gently pulling the valve handle out to its stop. _____

D. Complete insertion of the syringe needle into brass needle guide until the syringe needle nut mates into the brass needle guide slot. _____

E. Withdraw a volume of gas as determined by Attachment C, then lock the sample in the syringe by unscrewing the syringe body two turns. Use the red dots on the sryinge as a reference to determine the two turns. _____

F. Withdraw the syringe carefully from the brass needle guide and close V-14 by gently pushing the valve handle onto its stop. _____

G. Inject the gas sample into the GAS SAMPLE TRANSFER CONTAINER vial.

H. Place shield top on the transfer container. _____

I. Close upper access door. _____

6.6.6 Exit area with sampler. _____

6.7 Flush following Sample Retrieval

6.7.1 Line up Sample Modules as Follows:

V-1	BY-PASS _____	V-7	IN-LINE _____	V-15	CLOSED _____
V-2	GRAB _____	V-8	BY-PASS _____	V-16	CLOSED _____
V-3	SAMPLE _____	V-11	GAS _____	V-17	CLOSED _____
V-4	CLOSED _____	V-12	IN-LINE _____	V-18	HI-FLOW _____
V-6	CLOSED _____	V-13	BY-PASS _____		

6.7.2 Align a sample return path

6.7.2.1 To RHR open SS-SOV-164 (control) and SS-SOV-165 (PASS panel) _____

6.7.2.2 To VCT open SS-SOV-173 (control) and SS-SOV-166 (PASS panel) _____

6.7.3 Align the flush system by opening SS-SOV-170 (PASS Panel) _____

6.7.4 Flush as follows:

A. Open V-4, V-6, V-16 and V-17. _____

B. Position V-13 to IN-LINE and start the PUMP. A flow should be evident on the FLOW-METER. Continue this flush for about three (3) minutes. _____

C. Position V-12 and V-13 to BY-PASS for 30 seconds and then position:

V-8 to IN-LINE, stop the PUMP and position V-12 to IN-LINE. Continue this flush for about three (3) minutes. _____

D. Position V-7 and V-8 to BY-PASS, then position V-2 to BY-PASS. In 30 seconds, CLOSE V-4, V-6, V-16 and V-17, then position V-1 and V-2 to GRAB. _____

E. Flush for three (3) minutes and then position V-3 to NORMAL and FLUSH. _____

6.7.5 Secure the flush pump and align valves as follows:

SS-SOV-170 Sheet _____

V-1	GRAB	_____	V-8	IN-LINE	_____	V-15	CLOSED	_____
V-2	BY-PASS	_____	V-11	GAS	_____	V-16	CLOSED	_____
V-3	SAMPLE	_____	V-12	BY-PASS	_____	V-17	CLOSED	_____
V-4	OPEN	_____	V-13	BY-PASS	_____	V-18	HI-FLOW	_____
V-7	BY-PASS	_____	V-14	CLOSED	_____	V-18	HI-FLOW	_____

6.8 Restore system for further sampling

6.8.1 Close V-4, open V-15 and blowdown the upper leg of the gas loop. Position V-12 and V-13 to IN-LINE and continue the blowdown. Then place V-12 in BY-PASS. _____

6.8.2 Position V-8 to BY-PASS and blow down the lower leg of the gas loop. Position V-7 and V-8 to IN-LINE and continue the blowdown. Position V-12 to IN-LINE and continue blowdown for 10 seconds. _____

6.8.3 Close V-15 and position V-11 to liquid. _____

6.8.4 Align the modules as follows:

V-1	GRAB ____	V-6	CLOSED____	V-11	LIQUID____	V-15	CLOSED ____
V-2	BY-PASS ____	V-7	BY-PASS____	V-12	INLINE____	V-16	CLOSED ____
V-3	NORMAL and FLUSH____	V-8	BY-PASS____	V-13	INLINE____	V-17	CLOSED ____
V-4	CLOSED ____	V-9	CLOSED____	V-14	CLOSED____	V-18	LO-FLOW____

_____

6.8.5 Isolate the sample return path

6.8.5.1 To RHR close SS-SOV-164 (control) and SS-SOV-165 (PASS Panel). _____

6.8.5.2 To VCT open SS-SOV-173 (control) and SS-SOV-166(PASS Panel). _____

6.8.6 Back off the nitrogen pressure regulator of 0 PSIG as read on the Nitrogen Regulated Pressure gauge. _____

6.8.7 Record totalizer meter reading on line 5, Attachment B. _____

The system is now checked out and ready for operation, or it can be secured to shutdown just turn off power by depressing PASS panel power on button.

ATTACHMENT A
DETERMINATION OF TOTAL DISSOLVED GAS
AND
VOLUME OF LIQUID DISCHARGED TO WASTE

MAY 3 1 1982

Sample No.: _____

Date/Time
Started: _____

A.1 RECORD (Data)

1. Totalizer meter reading (step 6.1.12) Qi ----------gal

2. Initial pressure in gas loop (step 6.3.3A) Pi _____psig

3. Final pressure in gas loop (step 6.3.3J) Pf _____psig

4. Temperature (Step 6.3.3 K) T-2 _____°F

5. Totalizer meter reading (Step 6.8.7) Qf _____gal

A.2 CALCULATE

6. Correct initial pressure (Pi) reading as follows:

   Pi x 0.98 = Pic Pic _____psig

7. Convert T-2 to Rankine as follows:

   T-2 + 460 = TR TR _____ °R

8. Determine vapor pressures (Pvp) as follows:

   Enter figure A-1 with the temperature T-2 (line 4) and record Pvp. Pvp _____psi

9. Determine partial pressure (Pp) of the gas as follows: Pp = _____psi

   Pf - Pic - Pvp = Pp

10. Calculate TDG* as follows: TDG _____ cc/Kg

$$cc/Kg = 2.927 \times 10^4 \times \frac{Pp}{TR} + 1.36\ Pp$$

OR use the graph, figure A-2.

11. Calculated total inventory of liquid passed through unit as follows:

Qf - Qi = Q Q = _____ gal

A.3 SUMMARY

12. Total dissolved gas content (from line 10) = _____ cc/Kg

13. Total liquid passed through unit (from line 11) = _____ gal

Data recorded by:

_____

Date: _____

Calculation made by:

_____

Date: _____

Checked by:

_____

Date/Time: _____

*Related to standard temperature (0° C) and pressure (1 atm).

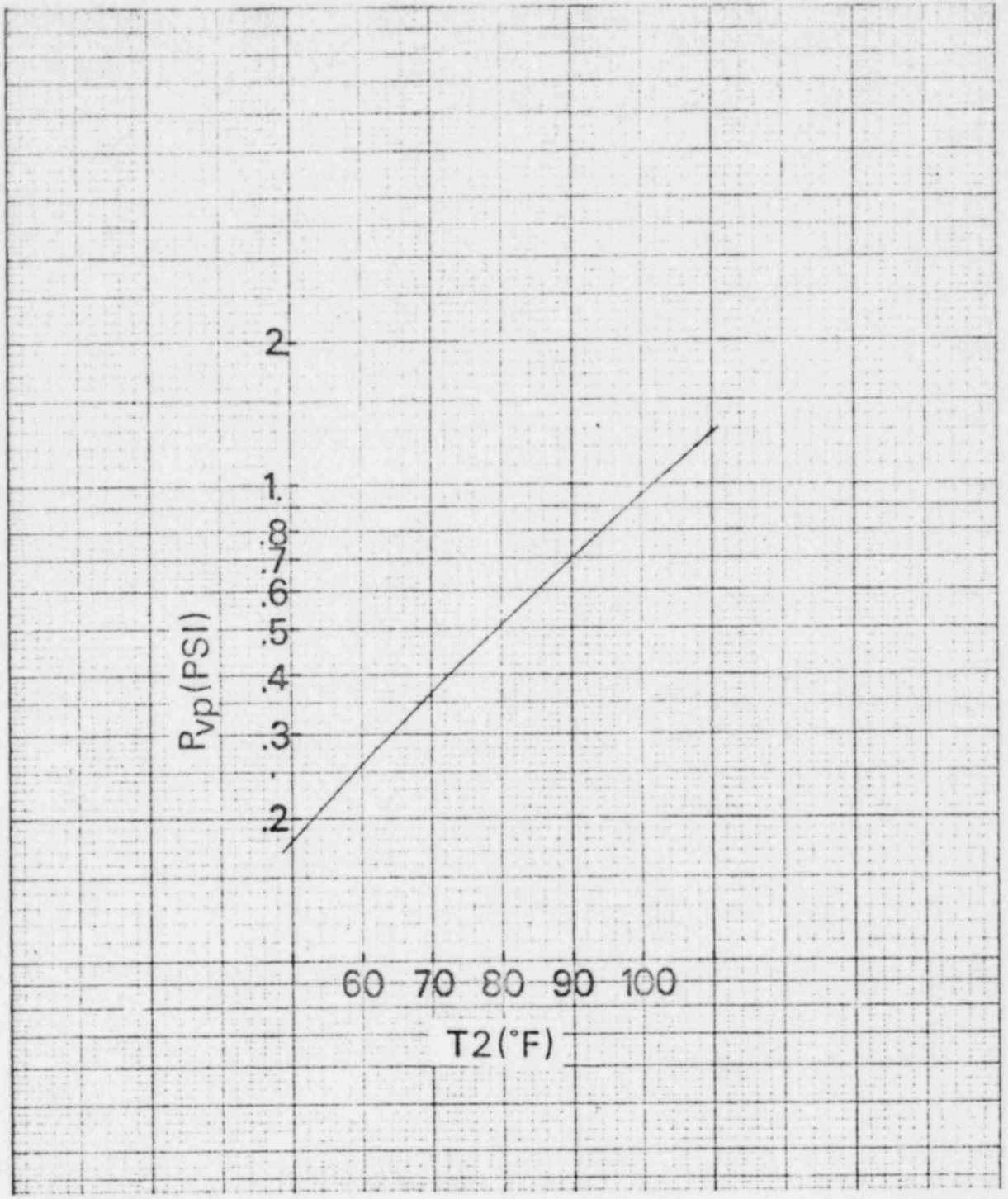


Figure A-1. Vapor Pressure Graph

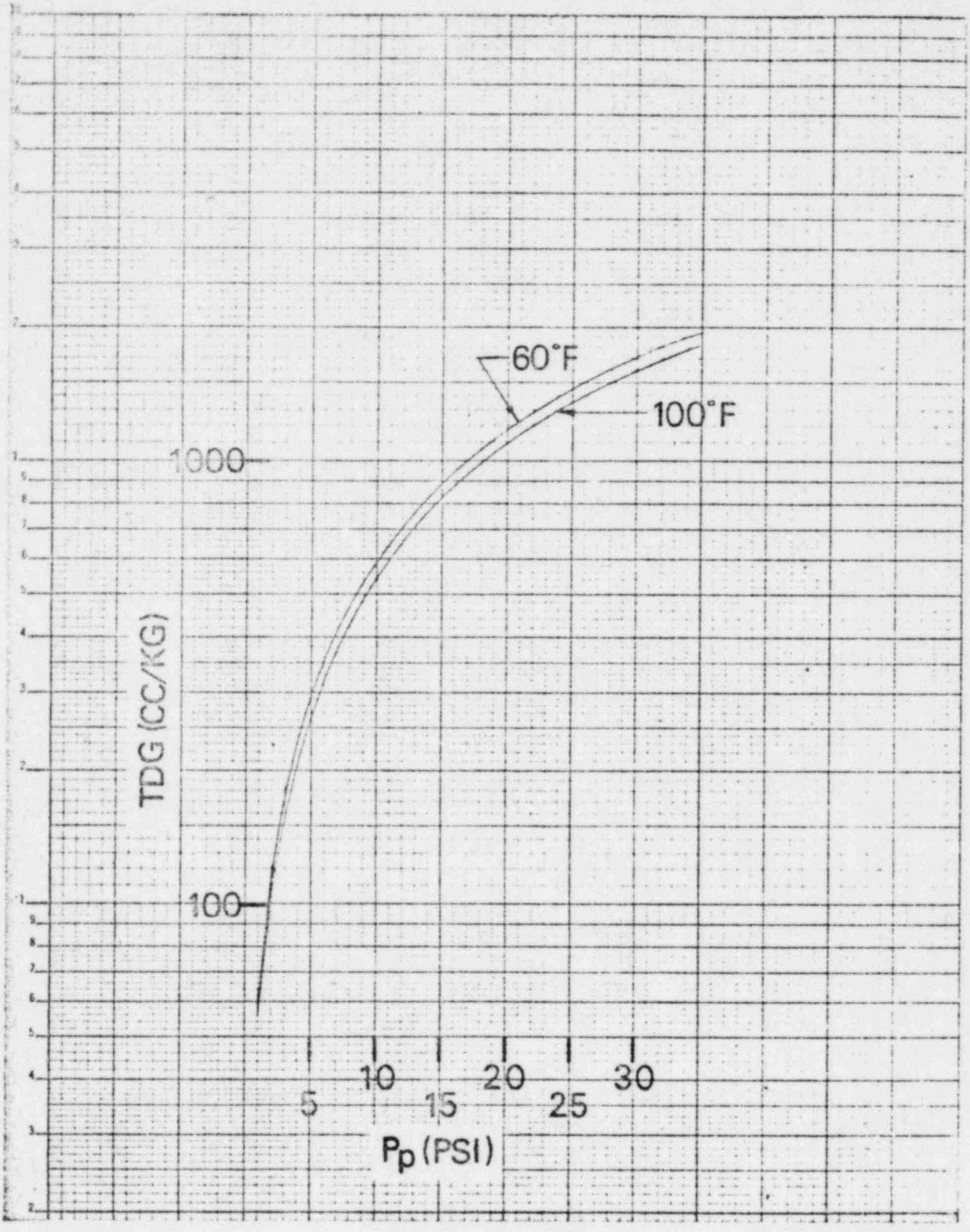


Figure A-2. Total Dissolved Gas (TDG) Graph

MAY 3 1 1982

B.1 EXPOSURE ESTIMATE TO RETRIEVE 2-ML GRAB SAMPLE

B.1.1 Assumptions

a. Reactor coolant is pressurized at 385 R/hr/cc at 2".

b. Isotopes average 1.0 MeV for shielding calculations.

c. Source is at center of lead shield, which is 2" thick, except where tubing enters valve; lead thickness is 1-1/4" in these two areas. 1-1/4" lead thickness is used for calculations (1-1/4" lead = 0.14 shielding factor for one MeV).

d. Sample volume of 2-ml grab sample is 2.2 ml.

e. The only source of exposure is the 2-ml grab sample.

f. Lead shield is 5.25" dia; source is 2.625" from outside edge of shield.

B.1.2 Sampling Procedure

a. Enter room and approach SAMPLE MODULE cabinet door.	10 seconds
b. Open SAMPLE MODULE door and pull sample tray out.	10 seconds
c. Disconnect air lines.	15 seconds
d. Remove sample from tray, place in shielded container, and cover container.	30 seconds
e. Close SAMPLE MODULE door and exit room.	10 seconds

B.1.3 Dose Rate of Sample (at location of minimum shielding)

$$\text{Dose Rate} = 2.2 \text{ ml} \times 385 \text{ R/hr/ml} \times \left[\frac{2"}{2.625"}\right]^2 \times 0.14 = 68.8 \text{ R/hr}$$

B.1.4 Exposure Estimate

1. Enter room.

The retriever walks from 15 ft to 1 ft away from sample cat net in 10 seconds. When standing in front of the sample cabinet, the retriever will be about 18 in. from the grab sample. Dose rate at 18 in.=

$$68.8 \text{ R/hr} \times \left[\frac{2.625}{20.625}\right]^2 \times \frac{1 \text{ hr}}{3600 \text{ sec}} \times \frac{1000 \text{ mR}}{\text{R}} = \frac{0.3 \text{ mR}}{\text{sec}}$$

Therefore, whole body and extremity exposure are assumed to be negligible for entering the room.

2. Open sample door and pull out sample tray.

The retriever is approximately 12 in. away from the grab sample for approximately 10 seconds.

$$\text{Whole body (WB) dose received} = 68.8 \frac{R}{hr} \times \frac{1000\ mR}{R} \times \left[\frac{2.625}{14.625}\right]^2 \times 10\ sec \times \frac{1\ hr}{3600\ sec} = 6.2.\ mRem\ (WB)$$

The retriever's hand is approximately 8 in. away from the grab sample for 10 seconds.

$$\text{Extremity dose received} = 68.8 \frac{R}{hr} \times \frac{1000\ mR}{R} \times \left[\frac{2.625}{10.625}\right]^2 \times 10\ sec \times \frac{1\ hr}{3600\ sec} = 11.7\ mRem\ (Ext.)$$

3. Disconnect air lines.

The retriever is approximately 12 in. from the grab sample for 15 seconds.

$$\text{Whole body dose received} = 68.8 \frac{R}{hR} \times \frac{1000\ mR}{R} \times \left[\frac{2.625}{14.625}\right]^2 \times 15\ sec \times \frac{1\ hr}{3600\ sec} = 9.2\ mRem\ (WB)$$

The retriever's hand is approximately 4 in. away from the grab sample for 15 seconds.

$$\text{Extremity dose received} = 68.8 \frac{R}{hr} \times \frac{1000\ mR}{R} \times \left[\frac{2.625}{6.625}\right]^2 \times 15\ sec \times \frac{1\ hR}{3600\ sec} = 45\ mRem\ (Ext.)$$

4. Remove sample from tray, place in shielded container, and place cover on container.

The retriever is 4 in. away from the grab sample for 20 seconds while handling the sample and 12 in. away for 10 seconds while replacing the container cover.

$$\text{Whole body dose received} = \left(68.8\ \frac{R}{hr} \times \frac{1000\ mR}{R} \times \left[\frac{2.625}{6.625}\right]^2 \times 20\ sec \times \frac{1\ hr}{3600\ sec}\right) + \left(\left[\frac{2.625}{14.626}\right]^2 \times 10\ sec \times \frac{1\ hr}{3600\ sec}\right)$$

$$= 60\ mRem\ (WB)$$

The retriever's hand is 6 in. away from the grab sample for 30 seconds.

$$\text{Extremity dose received} = 68.8\ \frac{R}{hr} \times \frac{1000\ mR}{R} \times \left[\frac{2.625}{8.625}\right]^2 \times 30\ sec \times \frac{1\ hr}{3600\ sec} = 53.1\ mRem\ (Ext.)$$

5. Exit area.

Since the source is now in the shielded transfer container, exposure to the retriever is negligible.

B.1.5 Summary

- Whole Body (B.1.4)

1. 0 mR
2. 6.2 mR
3. 9.2 mR
4. 60.0 mR
5. 0 mR

75.4 mRem TOTAL WHOLE BODY DOSE

rounded to 76 mRem

- Extremity (Hand) (B.1.4)

1. OmR
2. 11.7 mR
3. 45.0 mR
4. 53.1 mR
5. 0 mR

109.8 mR TOTAL EXTREMITY (HAND) DOSE

rounded to 110 mRem

NOTE: If samples are in the 5-ml sample chambers, the dose rate from these sources is:

12.7 R/hr + 16.5 R/hr = 29.2 R/hr at 4.75 in.

These sources increase whole body and extremity doses by about 20 mRem or to 96 mRem whole body and 130 mRem extremity.

B.2 EXPOSURE ESTIMATE TO OBTAIN REACTOR COOLANT SAMPLES FROM 5-ML SAMPLE CHAMBERS

B.2.1 Assumptions

1. 5 ml of degassed liquid reactor coolant exists in one 5-ml sample chamber and 5 ml of reactor coolant gas exists in the other 5-ml sample chamber.

2. Degassed liquid reactor coolant reads 167.4 R/hr/cc at 2 in. Reactor coolant gases, read 217.6 R/hr/cc at 2 in. Total of reactor coolant, including gases, is 385 R/hr/cc based on worst case plant which is Connecticut Yankee.

3. Radiation levels are per figures B-1 through B-4.

4. The following samples are withdrawn:

45

10 μl reactor coolant liquid for boron and rad analysis
50 μl reactor coolant liquid for chloride analysis
10 μl reactor coolant gas for rad analysis

5. For extremity calculations, fingers are 1 in. away from sample source when sample is in syringe.

6. Sample is in syringe 30 seconds.

7. Each sample requires one minute to draw and place in shielded container.

8. The only sources of exposure are the two 5-ml sample chambers.

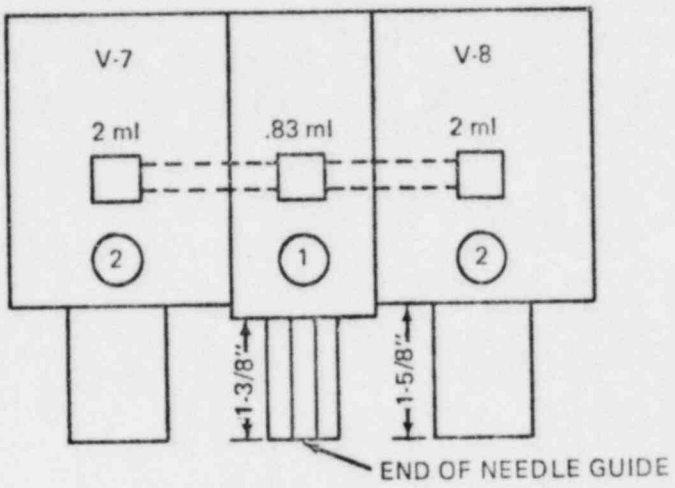
B.2.2 Sampling Procedure

1. Enter sample area.	10 sec
2. Open lower sample door, open liquid sample sample chamber valve, insert syringe needle, and draw 60 μl sample into syringe (for boron, rad analysis, and chlorides).	30 sec
3. Withdraw syringe with 60 μl sample, shut valve, inject 10 μl of sample into shielded vial, and place syringe with 50 μl sample into shielded transfer container.	30 sec
4. Shut lower door, open upper door, open gas sample chamber valve, insert syringe needle, and draw 10 μl gas sample into syringe (for rad analysis).	30 sec
5. Withdraw syringe with 10 μl sample, shut valve, inject 10 μl sample into shielded vial, and close sample cabinet upper door.	30 sec
6. Exit sample area.	10 sec

B.2.3 Dose Rate at 5-ml Sample Chamber

1. Degassed RC Liquid

a. Dose rate at end of needle guide



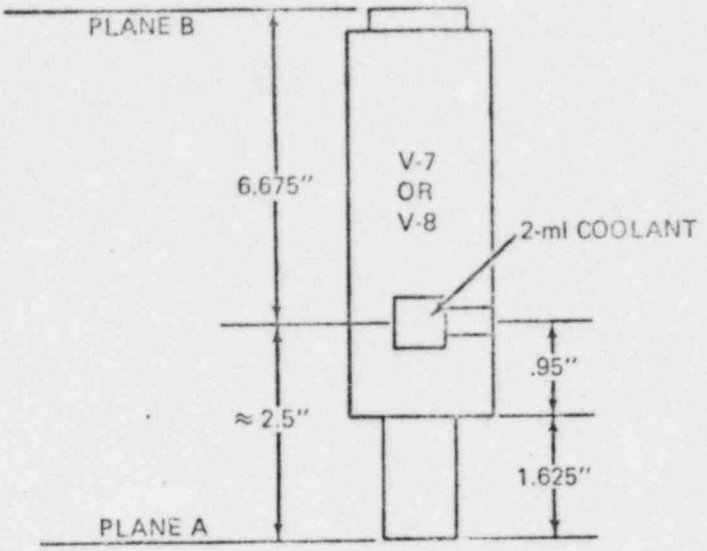
Assume shielding factor for brass needle guide 1-3/8 in. long = 0.31.

Assume 0.83 ml is point source, since the retriever is looking at the end of a columnar source. Assume the point source is located 2-3/4 in. from the outside end of the needle guide.

Dose rate at the end of the needle guide:

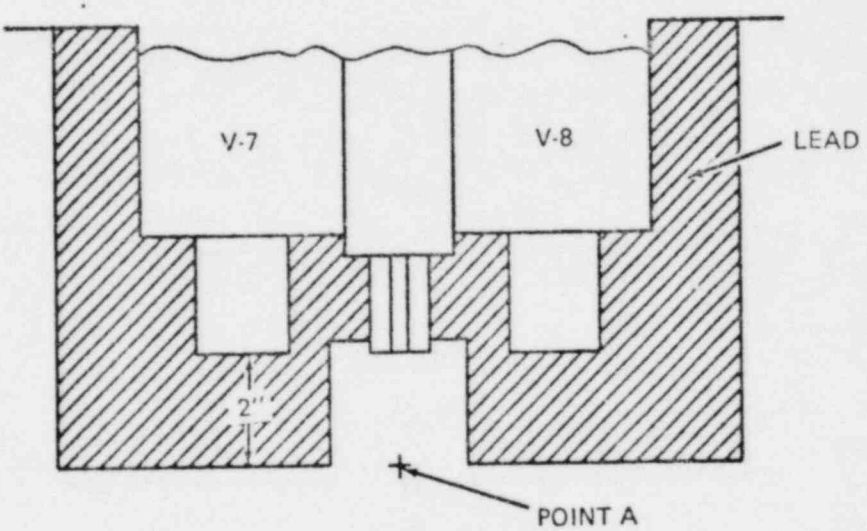
$$0.83 \text{ cc} \times 167.4 \text{ R/hr/cc} \times \left[\frac{2}{2.75}\right]^2 \times 0.31 = 23 \text{ R/hr}$$

b. Dose rate at base of valves V-7 and V-8



Dose rate at plane A = 167.4 R/hR/cc x 2 cc $x\left[\frac{2}{2.5}\right]^2$ = 214 R/hr

c. Dose rate outside lead shield on sample chamber at location of hand (point A)

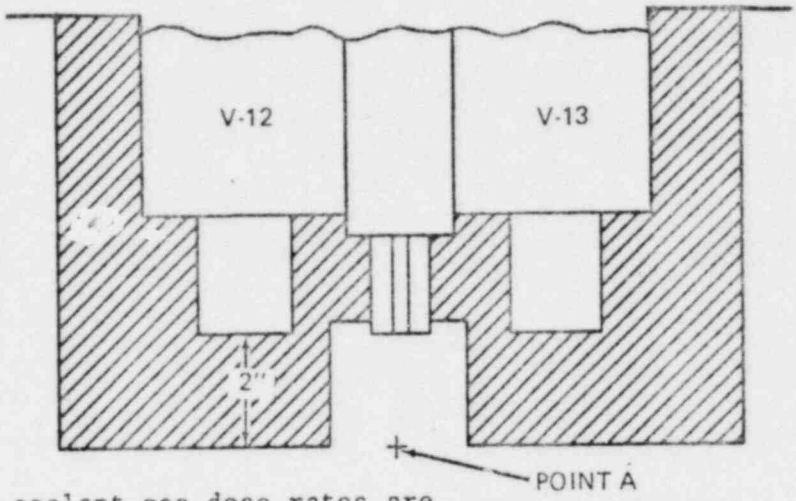


Dose rate at point A is comprised of dose rate 2 in. from the end of needle guide plus dose rate 2 in. from the end of valves V-7 and V-8, shielded by 2 in. of lead which has a shielding factor of 0.0381.

$$\text{Dose Rate} = \left(23 \text{ R/hr} \times \left[\frac{2.75}{4.75}\right]^2 \times 0.0381\right) + \left(2 \times 214 \text{ R/hr} \times \left[\frac{2.5}{4.5}\right]^2\right)$$

$$= 12.7 \text{ R/hr}$$

2. Reactor coolant gases



Reactor coolant gas dose rates are
$\frac{217.6}{167.4}$ = 1.3 times higher than degassed reactor coolant.

Dose Rate = 12.7 R/hr x 1.3 = 16.5 R/hr

B.2.4 Whole Body Dose

1. Enter room.

After entering the sample area, the retriever will be about 18 in. from the sample chambers which read 12.7 R/hr + 16.5 R/hr = 29.2 R/hr at approximately 4 in.

$$\text{Dose Rate at 18 in.} = 29200 \frac{\text{mR}}{\text{hR}} \times \frac{1 \text{ hr}}{3600 \text{ sec}} \times \left[\frac{4}{22}\right]^2$$

$$= 0.27 \text{ mR/sec}$$

Therefore, whole body and extremity exposure are assumed to be negligible for entering the room.

2. Open sample door and draw 60 μ l sample.

   Assume body is 12 in. away from sample chambers and syringe and dose rate from RC liquid sample chamber is 12.7 R/hr at 4.75 in. and from RC gas sample chamber is 16.5 R/hr at 4.75 in.

$$\text{Dose} = (12.7\ \text{R/hr} + 16.5\ \text{R/hr}) \times \left[\frac{4.75}{16.75}\right]^2 \times 1/2\ \text{min} \times \frac{1\ \text{hr}}{60\ \text{min}}$$

$$= 20\ \text{mRem}$$

3. Withdraw syringe, inject 10 μ l into shielded vial, and place syringe with 50 μ l in shielded transfer container.

   Assume 10 seconds to withdraw sample with sample chambers 12 in. away and 30 seconds exposure to 60 μ l sample.

$$\text{Dose} = \left((12.7\ \text{R/hr} + 16.5\ \text{R/hr}) \times \left[\frac{4.75}{16.75}\right]^2 \times 1/6\ \text{min} \times \frac{1\ \text{hr}}{60\ \text{min}}\right) + \left(167.4\ \text{R/hr/cc} \times \left[\frac{2}{12}\right]^2 \times 0.06\ \text{cc} \times 1/2\ \text{min} \times \frac{1\ \text{hr}}{60\ \text{min}}\right)$$

$$= 9\ \text{mRem}$$

4. Close lower door, open upper door, and draw 10 μ l gas sample.

   Dose is the same as calculated in step 2 (B.2.4).

   Dose = 20 mRem

5. Withdraw syringe and inject 10 μ l sample into shielded vial.

   Assume 10 seconds to withdraw sample with sample chambers 12 in. away and 30 seconds exposure to 10 μ l sample.

$$\text{Dose} = \left((12.7\ \text{R/hr} + 16.5\ \text{R/hr}) \left[\frac{4.75}{16.75}\right]^2 \times 1/6\ \text{min} \times \frac{1\ \text{hr}}{60\ \text{min}}\right) + \left(217.6\ \text{R/hr/cc} \times 0.01\ \text{cc} \times \left[\frac{2}{12}\right]^2 \times 1/2\ \text{min} \times \frac{1\ \text{hr}}{60\ \text{min}}\right)$$

$$= 7\ \text{mRem}$$

6. Exit sample area.

   Dose is negligible as shown in calculation step 1 (B.2.4) for entering the room.

7. Total Whole Body Dose

   Dose = 20 + 9 + 20 + 7 = 56 mRem

B.2.5 Extremity Dose

1. Enter room.

The extremity dose for entering the room is negligible as calculated in step 1 (B.2.4).

2. Open sample door and draw 60 μ l sample.

Assume hand is at point A for 30 seconds and 24 in. away from gas sample chamber for 30 seconds. The dose rate from the RC liquid sample chamber is 12.7 R/hr at 4.75 in. and from RC gas sample chamber is 16.5 R/hr at 4.75 in.

$$\text{Dose} = \left(12.7 \text{ R/hr} \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right) + \left(16.5 \text{ R/hr} \times \left[\frac{4.75}{28.75}\right]^2 \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right)$$

$$= 106 \text{ mRem}$$

In addition to this dose, a dose is received from gas streaming through 0.031-in. dia hole in the needle guide. Assuming a columnar source 0.031-in. dia x 1-1/2-in. long, the volume is:

$$\left[\frac{0.03}{4}\right]^2 \times 1.5 \times 16.39 \frac{\text{cc}}{\text{in.}^3} = 0.017 \text{ cc}$$

$$\text{Dose} = 167.4 \text{ R/hr/cc} \times 0.017 \text{ cc} \times \left[\frac{2}{2.75}\right]^2 \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$= 12 \text{ mRem}$$

Total Dose = 106 + 12 =118 mRem

3. Withdraw syringe, inject 10 μ l sample into shielded vial, and place syringe with 50 μ l sample in shielded transfer container.

Assume hand is at point A for 10 seconds and is 1 in. away from 60 μl sample for 30 seconds.

$$\text{Dose} = \left(12.7 \text{ R/hr} \times 1/6 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right) + \left(167.4 \text{ R/hr/cc} \times 0.06 \text{ cc} \times \left[\frac{2}{1}\right]^2 \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right)$$

$$= 370 \text{ mRem}$$

4. Close lower door, open upper door, and draw 10 μ l gas sample. Using the same assumption of step 2 (B.2.5):

$$\text{Dose} = \left(16.5 \text{ R/hr} \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right) + \left(12.7 \text{ R/hr} \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \left[\frac{4.75}{23.75}\right]^2\right) + \left(217.6 \text{ R/hr/cc} \times 0.017 \text{ cc} \times \left[\frac{2}{2.75}\right]^2 \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right)$$

$$= 157 \text{ mRem}$$

5. Withdraw syringe and inject 10 μ l sample into shielded vial.

Assume hand is at point A for 10 seconds and 1 in. away from 10 μ l sample for 30 sec.

$$\text{Dose} = \left(16.5 \text{ R/hr} \times 1/6 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right) + \left(217.6 \text{ R/hr/cc} \times 0.01 \text{ cc} \times \left[\frac{2}{1}\right]^2 \times 1/2 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}}\right)$$

$$= 118 \text{ mRem}$$

6. Exit sample area.

Dose is negligible as shown in calculation of step 1, para B.2.4, for entering room.

7. Total extremity dose

Dose = 118 + 370 + 157 + 118 = 763 mRem

B.2.6 Summary

Whole Body Dose = 56 mRem

Extremity Dose = 763 mRem

MAY 3 1 1982

C.1 INTRODUCTION

The quantity of reactor coolant gas to be removed for rad analysis depends on the capability of the utility's instrumentation, considering configuration and estimated energy level of the gas to be extracted. The required volume is as determined below.

The quantity of degassed reactor coolant liquid required for rad analysis also depends on the capability of the utility's instrumentation, considering configuration and estimated energy level of the coolant to be extracted. Since there is no dilution of the coolant, no calculations are required.

C.2 DETERMINATION OF SAMPLE VOLUME GAS

Data

1. From Attachment A, line 3 enter — Pf_____psig
2. From Attachment A, line 7 enter — TR_____°R
3. From Attachment A, line 9 enter — Pp_____psi

Calculation

1. Percentage of reactor coolant gas in the removed volume (Vs):

$$\% = \frac{Pp}{Pf + 14.7} \times 100\%$$

Rad Gas_____%

2. Pressure correction factor:

$$Pcf = \frac{Pf + 14.7}{14.7}$$

Pcf_____

3. Temperature correction factor:

$$Tcf = \frac{492}{TR}$$

Tcf_____

4. Volume of reactor coolant gas (Vrg) at STP

$$Vrg = Vs \times Pcf \times Tcf \times \%\text{rad gas}$$

Vrg_____

C.3 EXAMPLE I

During an accident sample evolution, 100 μl of gas is removed from the SAMPLE MODULE 5-ml shielded gas sample chamber. What is the quantity of reactor coolant gas in the 100 μl withdrawn?

Solution

Referring to Appendix A, transcribe the following existing data:

1. Pf = 50 psig

2. TR = 530° R

3. Pp = 5 psi

4. Percent reactor coolant gas in the volume is:

$$\% = \frac{Pp}{Pf + 14.7} \times 100\% = \frac{5}{50 + 14.7} \times 100\% = 7.73\%$$

5. Pressure correction factor:

$$Pcf = \frac{Pf + 14.7}{14.7} = \frac{50 + 14.7}{14.7} = 4.40$$

6. Temperature correction factor:

$$Tcf = \frac{492}{TR} = \frac{492}{530} = 0.93$$

7. Volume of reactor coolant gas:

$$Vrg = Vs \times Pcf \times Tcf \times \%$$

$$= 100\ \mu l \times 4.40 \times 0.93 \times \frac{7.73}{100} = 31.63\ \mu l$$

C.4 EXAMPLE II

During an accident sample evolution, 20 μ l of reactor coolant gas is required for a radiological count. What quantity of the gas mixture should be removed from the SAMPLE MODULE 5-ml shielded gas sample chamber?

Solution

Using the same data from Example I:

1. Pf = 50 psig

2 TR = 530° R

3. Pp = 5 psi

MAY 3 1 1982

4. Percent reactor coolant gas in the removed volume is:

$$= \frac{Pp}{Pf + 14.7} \times 100\% = \frac{5}{50 + 14.7} \times 100\% = 7.73\%$$

5. Pressure correction factor:

$$Pcf = \frac{Pf + 14.7}{14.7} = \frac{50 + 14.7}{14.7} = 4.40$$

6. Temperature correction factor:

$$Tcf = \frac{492}{TR} = \frac{492}{530} = 0.93$$

7. Volume of gas mixture to be removed to obtain 20 μ l of reactor gas:

$$20 = Vs \times Pcf \times Tcf \times \%$$

$$Vs = 20 \times \frac{1}{Pcf} \times \frac{1}{Tcf} \times \frac{1}{\%}$$

$$= 20 \times \frac{1}{4.40} \times \frac{1}{0.93} \times \frac{100}{7.73} = 63\,\mu l$$

To obtain 20 μ l of reactor coolant gas, 63 μ l of the gas mixture must be withdrawn in the syringe.

JUN 3 0 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure
EPP 1.5-5

SITE AREA EMERGENCY

APPROVED BY STATION SUPERINTENDENT
EFFECTIVE DATE 6-30-82

1.0 PURPOSE

This procedure establishes the necessary emergency measures to be taken if a site-area emergency occurs.

2.0 RESPONSIBILITY

The Shift Supervisor/Director of Station Emergency Operations shall ensure that this procedure is implemented.

3.0 ACTIONS

3.1 Plant conditions and indications have resulted in the declaration of a site area emergency. The Shift Supervisor ensures the following.

3.1.1 Sound station annunciation alarm announcing over the public address system that a site area emergency has occurred, giving a brief description of the event.

3.1.2 Sound site evacuation alarm.

3.1.3 Implement EPP 1.5-14, Evacuation and Assembly.

3.1.4 Ensure that the Shift Supervisor Staff Assistant (SSSA) implements EPP 1.5-2, Notification and Communication completing the required notifications therein.

3.1.5 Dispatch on-shift Health Physics Tech and Chemistry Tech to conduct initial energency actions if EOF is not fully activated.

NOTE: Once EOF is fully activated, the Chem Tech and Health Physics Tech will report to the Managers of Dose Assessment and Manager of Radiological Assessment respectfully.

3.1.6 Continuously assess the emergency condition and implement appropriate corrective actions based upon the assessment using EOPs/AOPs.

3.2 The Director of Station Emergency Operations (EPP 1.5-21) will ensure the following is completed.

NOTE: The Shift Supervisor will perform these tasks until the Duty Officer assumes the Director of SEO position at the Emergency Operations Facility (EOF).

NOTE: The Director of Station Emergency Operations is responsible for classifying the incident and providing protective action recommendations once at the EOF. The transfer of responsibility shall be verbal, clear and direct.

NOTE: The responsibility for classifying the incident and providing protective action recommendations becomes the Director of Station Emergency Operations once at the EOF relieving the Shift Supervisor. The transfer of responsibility shall be verbal, clear and direct.

3.2.1 Implement EPP 1.5-13, Personnel Accountability.

3.2.2 Provide periodic meteorological data and dose estimates to offsite agencies.

3.2.3 Provide release and dose projections based on available plant condition information.

3.2.4 Downgrade the site area emergency if warrented by initiating conditions.

- o alert: EPP 1.5-4
- o unusual event: EPP 1.5-3

3.2.5 Escalate to a more severe classification, if warrented by initiating conditions.

- o general emergency: EPP 1.5-6

3.2.6 Terminate the emergency classification based upon the normalization of initiating conditions.

3.2.7 Closeout the site area emergency or class reduction with a verbal summary report to offsite agencies.

3.2.8 Provide a written summary report to offsite agencies by the end of the next working day following the closeout or class reduction.

3.3 The Manager of Radiological Assessment (Refer to EPP 1.5-22) will ensure the following is completed.

3.3.1 Emergency Teams dispatched for radiological surveys at the Emergency Operations Facility (EOF) as deemed necessary (Refer to EPP 1.5-8).

3.3.2 Emergency Teams dispatched to conduct onsite surveys (Refer to EPP 1.5-9).

3.4 The Manager of Dose Assessment (Refer to EPP 1.5-37) will ensure the following is completed.

3.4.1 Emergency Teams dispatched to conduct offsite surveys (Refer to EPP 1.5-10).

3.4.2 Perform dose calculations for offsite radiological assessment.

3.5 The Managers in the emergency organization shall perform the actions specified in their emergency procedure.

4.0 ATTACHMENTS/EXHIBITS

None

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-2, Notification and Communication.

5.2 EPP 1.5-3, Notification of Unusual Event.

5.3 EPP 1.5-4, Alert.

5.4 EPP 1.5-6, General Emergency.

5.5 EPP 1.5-7, Radiological Dose Assessment.

5.6 EPP 1.5-8, EOF Emergency Radiological Surveys.

5.7 EPP 1.5-9, Onsite Emergency Radiological Surveys.

5.8 EPP 1.5-10, Offsite Emergency Radiological Surveys.

5.9 EPP 1.5-13, Personnel Accountability.

5.10 EPP 1.5-14, Evacuation and Assembly.

5.11 EPP 1.5-21, Director of Station Emergency Operations.

5.12 EPP 1.5-22, Manager of Radiological Assessment.

5.13 EPP 1.5-23, Manager of Security.

5.14 EPP 1.5-24, Manager of Communication.

5.15 EPP 1.5-25, Manager of Public Information.

5.16 EPP 1.5-26, Manager of Control Room Operations.

5.17 EPP 1.5-27, Manager of Onsite Resources.

5.18 EPP 1.5-28, Manager of Technical Support.

5.19 EPP 1.5-37, Manager of Dose Assessment.

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 6-30-82

Connecticut Yankee

Emergency Plan Procedure
EPP 1.5-4

ALERT

1.0 PURPOSE

This procedure establishes the necessary emergency measures to be taken if an alert condition occurs.

2.0 RESPONSIBILITY

The Shift Supervisor/Director of Station Emergency Operations shall ensure that this procedure is implemented.

3.0 ACTIONS

3.1 Plant conditions and indications have resulted in the declaration of an alert. The Shift Supervisor ensures the following:

3.1.1 Sound station annunciation alarm announcing over the public address system that an alert has occurred, giving a brief description of the event.

3.1.2 Sound site evacuation alarm.

3.1.3 Implement EPP 1.5-14, Evacuation and Assembly.

3.1.4 Ensure that the Shift Supervisor Staff Assistant (SSSA) implements EPP 1.5-2, Notification and Communication, completing the required notifications therein.

3.1.5 Dispatch on-shift Health Physics Tech and Chemistry Tech to conduct initial emergency actions if EOF is not fully activated.

NOTE: Once EOF is fully activated, the Chem Tech and Health Physics Tech will report to the Manager of Dose Assessment and Manager of Radiological Assessment respectfully.

3.1.6 Continuously assess the emergency condition and implement appropriate corrective actions based upon the assessment using EOPs/AOPs.

3.2 The Director of Station Emergency Operations (EPP 1.5-21) will ensure the following is completed.

NOTE: The Shift Supervisor will perform these tasks until the Duty Officer assumes the Director of SEO position at the Emergency Operations Facility (EOF).

NOTE: The Director of Station Emergency Operations is responsible for classifying the incident and providing protective action recommendations once at the EOF. The transfer of responsibility shall be verbal, clear and direct.

NOTE: The responsibility for classifying the incident and providing protective action recommendations becomes the Director of Station Emergency Operations once at the EOF relieving the Shift Supervisor. The transfer of responsibility shall be verbal, clear and direct.

3.2.1 Implement EPP 1.5-13, Personnel Accountability.

3.2.2 Assess the need to provide offsite agencies with meteorological data.

3.2.3 Downgrade the alert classification, if warrented by initiating conditions.

- o Unusual event: EPP 1.5-3

3.2.4 Escalate to a more severe classification, if warrented by initiating conditions.

- o site area emergency: EPP 1.5-5
- o general emergency: EPP 1.5-6

3.2.5 Terminate the emergency classification based upon the normalization of initiating conditions.

3.2.6 Closeout the alert or class reduction with a verbal summary report to offsite agencies.

3.2.7 Provide a written summary report to offsite agencies by the end of the next working day following the closeout or class reduction.

3.3 The Manager of Radiological Assessment shall evaluate the need for radiological surveys at the EOF and onsite. (Refer to EPP 1.5-22).

3.4 The Managers in the emergency organization shall perform the functions specified in their emergency procedure.

4.0 ATTACHMENTS

None.

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-2, Notification and Communication.

5.2 EPP 1.5-3, Notification of Unusual Event.

5.3 EPP 1.5-5, Site Area Emergency.

5.4 EPP 1.5-6, General Emergency.

5.5 EPP 1.5-13, Personnel Accountability.

5.6 EPP 1.5-14, Evacuation and Assembly.

5.7 EPP 1.5-21, Director of Station Emergency Operations.

5.8 EPP 1.5-22, Manager of Radiological Assessment.

5.9 EPP 1.5-23, Manager of Security.

5.10 EPP 1.5-24, Manager of Communications.

5.11 EPP 1.5-25, Manager of Public Information.

5.12 EPP 1.5-26, Manager of Control Room Operations.

5.13 EPP 1.5-27, Manager of Onsite Resources.

5.14 EPP 1.5-28, Manager of Technical Support.

5.15 EPP 1.5-37, Manager of Dose Assessment.

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee

Emergency Plan Procedure
EPP 1.5-3

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 6-30-82

NOTIFICATION OF UNUSUAL EVENT

1.0 PURPOSE

This procedure establishes the necessary emergency measures to be taken if an unusual event occurs.

2.0 RESPONSIBILITY

The shift supervisor and/or the duty officer is responsible for implementing this procedure.

3.0 ACTIONS

3.1 Plant conditions and indications have resulted in the declaration of an unusual event. The shift supervisor ensures the following:

3.1.1 Sound station annunciation alarm announcing over the public address system that an unusual event has occurred, giving a brief description of the event.

3.1.2 Ensure that the shift supervisor staff assistant (SSSA) implements EPP 1.5-2, Notification and Communications completing the required notifications therein.

3.1.3 Notify the duty officer and shift technical advisor for assistance in the control room.

3.1.4 Dispatch as required on-shift Health Physics Technician and on-shift Chemistry Technician for initial emergency actions.

3.1.5 Continuously assess the emergency conditions and implement appropriate corrective actions based upon the assessment using EOPs/AOPs.

3.2 The duty officer will ensure the following is completed.

NOTE: The shift supervisor will perform these tasks until the duty officer arrives in the control room.

NOTE: The Duty Officer is responsible for classifying the incident and providing protective action recommendations once onsite. This transfer of responsibility shall be verbal, clear and direct.

NOTE: The responsibility for classifying the incident and providing protective action recommendations becomes the Duty Officer's once onsite relieving the Shift Supervisor. The transfer of responsibility shall be verbal, clear and direct.

3.2.1 Escalate to a more severe classification, if warranted by initiating conditions.

- o alert: EPP 1.5-4
- o site area emergency: EPP 1.5-5
- o general emergency: EPP 1.5-6

3.2.2 Terminate the emergency classification, based upon the normalization of initiating conditions.

3.2.3 Closeout the unusual event with a verbal summary report to offsite agencies.

3.2.4 Provide a written summary report to offsite agencies by the end of the next working day.

4.0 ATTACHMENTS

None

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-2, Notification and Communication.

5.2 EPP 1.5-4, Alert.

5.3 EPP 1.5-5, Site Area Emergency.

5.4 EPP 1.5-6, General Emergency.

JUN 3 0 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee

Emergency Plan Procedure
EPP 1.5-6

GENERAL EMERGENCY

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 6-30-82

1.0 PURPOSE

This procedure establishes the necessary emergency measures to be taken if a general emergency occurs.

2.0 RESPONSIBILITY

The Shift Supervisor/Director of Station Emergency Operations shall ensure that this procedure is implemented.

3.0 ACTIONS

3.1 Plant conditions and indications have resulted in the declaration of a general emergency. The Shift Supervisor ensures the following.

3.1.1 Sound station annunciation alarm announcing over the public address system that a general emergency has occurred, giving a brief description of the event.

3.1.2 Sound site evacuation alarm.

3.1.3 Implement EPP 1.5-14, Evacuation and Assembly.

3.1.4 Ensure that the Shift Supervisor Staff Assistant (SSSA) implements EPP 1.5-2, Notification and Communication completing the required notifications therein.

3.1.5 Dispatch on-shift Health Physics Tech and Chemistry Tech to conduct initial emergency actions if EOF is not fully activated.

NOTE: Once the EOF is fully activated, the Chem Tech and Health Physics Tech will report to the Manager of Dose Assessment and Manager of Radiological Assessment respectfully.

3.1.6 Continuously assess the emergency condition and implement appropriate corrective actions based upon the assessment using EOPs/AOPs.

3.2 The Director of Station Emergency Operations (EPP 1.5-21) will ensure the following is completed.

NOTE: The Shift Supervisor will perform these tasks until the Duty Officer assumes the Director of SEO position at the Emergency Operations Facility (EOF).

NOTE: The Director of Station Emergency Operations is responsible for classifying the incident and providing protective action recommendations once at the EOF. The transfer of responsibility shall be verbal, clear and direct.

NOTE: The responsibility for classifying the incident and providing protective action recommendations becomes the Director of Station Emergency Operations once at the EOF relieving the Shift Supervisor. The transfer of responsibility shall be verbal, clear and direct.

3.2.1 Implement EPP 1.5-13, Personnel Accountability.

3.2.2 Provide periodic meteorological data and dose estimates to offsite agencies.

3.2.3 Provide release and dose projections based on available plant condition information.

3.2.4 Downgrade the general emergency if warrented by initiating conditions.

- o site area emergency: EPP 1.5-5
- o alert: EPP 1.5-4
- o unusual event: EPP 1.5-3

3.2.5 Terminate the emergency classification based upon the normalization of initiating conditions.

3.2.6 Closeout the general emergency or class reduction with a verbal summary report to offsite agencies.

3.2.7 Provide a written summary report to offsite agencies by the end of the next working day following the closeout or class reduction.

3.3 The Manager of Radiological Assessment (Refer to EPP 1.5-22) will ensure the following is completed.

3.3.1 Emergency Teams dispatched for radiological surveys at the Emergency Operations Facility (EOF) as deemed necessary (Refer to EPP 1.5-8).

3.3.2 Emergency Teams dispatched to conduct onsite surveys (Refer to EPP 1.5-9).

3.4 The Manager of Dose Assessment (Refer to EPP 1.5-37) will ensure the following is completed.

3.4.1 Emergency Teams dispatched to conduct offsite surveys (Refer to EPP 1.5-10).

3.4.2 Perform dose calculations for offsite radiological assessment.

3.5 The Managers in the emergency organization shall perform the actions specified in their emergency procedure.

4.0 ATTACHMENTS/EXHIBITS

None

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-2, Notification and Communication.

5.2 EPP 1.5-3, Notification of Unusual Event.

5.3 EPP 1.5-4, Alert.

5.4 EPP 1.5-5, Site Area Emergency.

5.5 EPP 1.5-7, Radiological Dose Assessment.

5.6 EPP 1.5-8, EOF Emergency Radiological Surveys.

5.7 EPP 1.5-9, Onsite Emergency Radiological Surveys.

5.8 EPP 1.5-10, Offsite Emergency Radiological Surveys.

5.9 EPP 1.5-13, Personnel Accountability.

5.10 EPP 1.5-14, Evacuation and Assembly.

5.11 EPP 1.5-21, Director of Station Emergency Operations.

5.12 EPP 1.5-22, Manager of Radiological Assessment.

5.13 EPP 1.5-23, Manager of Security.

5.14 EPP 1.5-24, Manager of Communication.

5.15 EPP 1.5-25, Manager of Public Information.

5.16 EPP 1.5-26, Manager of Control Room Operations.

5.17 EPP 1.5-27, Manager of Onsite Resources.

5.18 EPP 1.5-28, Manager of Technical Support.

5.19 EPP 1.5-37, Manager of Dose Assessment.

JUN 3 0 1982

PLANT OPERATIONS REVIEW COMMITTEE APPROVAL

Connecticut Yankee
Emergency Plan Procedure
EPP 1.5-1

EMERGENCY ASSESSMENT

APPROVED BY STATION SUPERINTENDENT

EFFECTIVE DATE 6-30-82

1.0 PURPOSE

This procedure identifies the initiating conditions and emergency action levels (EAL's) used to classify plant emergencies.

2.0 RESPONSIBILITY

2.1 The Shift Supervisor/Director of Station Emergency Operations is responsible for implementing this procedure.

3.0 ACTIONS

3.1 Classify the existing emergency condition using Attachment 1.

3.1.1 Determine the key condition which best describes the type of incident that has occurred.

3.1.2 Check all initiating conditions and EAL's for each NRC classification listed under that key condition.

3.1.3 If an emergency action level has been reached or exceeded, implement the appropriate procedure

- Unusual Event EPP 1.5-3
- Alert EPP 1.5-4
- Site Area Emergency EPP 1.5-5
- General Emergency EPP 1.5-6

3.1.4 Determine the corresponding State of Connecticut classification for each NRC classification level.

3.1.5 If activation of the emergency plan is not required, continue on for additional reporting requirements.

3.2 If an emergency action level has not been reached, refer to EPP 1.5-2, Notification and Communication for additional reporting requirements.

3.3 When outside assistance is required, refer to EPP 1.5-2, Notification and Communication, for applicable telephone numbers.

3.4 If activation of the emergency plan is not required and there is no reportable conditions, continue operation using normal operating procedures.

4.0 ATTACHMENTS

5.0 PROCEDURE CROSS REFERENCE

5.1 EPP 1.5-3, Notification of Unusual Event

5.2 EPP 1.5-4, Alert

5.3 EPP 1.5-5, Site-Area Emergency

5.4 EPP 1.5-6, General Emergency

JUN 3 0 1982

EMERGENCY ACTION LEVELS

BARRIER FAILURE OR IMMINENT BARRIER FAILURE

KEY CONDITIONS	UNUSUAL EVENT		ALERT CHARLIE-ONE		SITE AREA EMERGENCY CHARLIE-TWO		GENERAL EMERGENCY	
	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL
	A. Initiation of emergency core cooling with discharge to vessel. ECHO	A. Core cooling alarm and cont. press >5 psig and/or prz. press <1700 psig					A. Loss of 2 of 3 barrier with a potential loss of the 3rd barrier. BRAVO	A1. Loca indications and/or possible core melt. A2. Failure cont. isolation indicated by CR board indicator lights or visual observation and subsequent depressurization of cont. or cont. hydrogen concentration >4% or cont. press >40 psig
	B. Sudden fuel damage indication. ECHO	B. LD RMS alarm and chemistry sample results.	B. Severe loss of fuel cladding (greater than 1% fuel failures)	B. Chemistry sampling indicates >17.5 μci/ml I-131 in Rx coolant.	B. Degraded core with possible loss of coolable geometry.	b. Subcooled monitor zero or less and T/c >700°F (T/C-thermocouple or as indicated by samples.		
	C. Abnormal RCS temperature or pressure. ECHO	C. T cold >540.6°F or subcool monitor zero or prz. press <2000 psig for more than 2 hr.						
	D. Exceeding either PRI to SEC leak or PRI, leak rate per tech. specs. ECHO	D. PRI to SEC. leak >0.4 gpm total or 150 gpd for one steam generator or PRI leak >1 gpm unidentified and uncontained or >10 gpm or 3 liters 1 hr on RHR	D1. Rapid failure of steam generator tubes. D2. Reactor coolant leak rate >50 gpm.	D1. Air ejector/stack RMS alarm and auto start backup CHG pump and/or core cooling initiated. D2. Auto makeup to VCT and startup of backup CHG pump and cont. air part, RMS alarm and +prz. press.	D1. Rapid failure of tubes and simultaneous total loss of offsite power. D2. LOCA > 160 gpm (make-up pump capacity).	D1. Air ejector/stack/ SGBD RMS alarm and auto start of backup CHG pump and core cooling initiated and 480-4160 low voltage alarm. D2. Cont. sump level increasing and low prz. press alarm and cont. RMS high activity alarm	D1. Any potential core melt situation. BRAVO D2. Any potential core melt situation. BRAVO	D1. S.G. Tube failure indications and low volt 4160 and 480V >15 min. D2. LOCA >chg pump capacity and partial fail. ECCS as indicated by pump/vlv. status or failure to S.D. Rx as indicated by NIS or Total loss of all feedwater & failure of ECCS.
	E. Failure of RCS safety or relief value to close ECHO	E. PORV open alarm or indicating lights. Acoustical monitor alarm and/or PRT hi press/temp.						
	F. Significant loss of cont. integrity requiring shutdown by tech. spec. ECHO	F. Unexplained computer alarm or vapor container weight of air, or equipment failure resulting in inability to isolate containment penetration.						
	G. Unplanned depressurization of secondary side. ECHO	G. S.G. press 100 psi lower than expected or steam dump v1v/SG safety v1v open/stuck open.						

EMERGENCY ACTION LEVELS

	UNUSUAL EVENT		ALERT CHARLIE-ONE		SITE AREA EMERGENCY CHARLIE-TWO		GENERAL EMERGENCY	
	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL
BARRIER FAILURE OR IMMINENT BARRIER FAILURE			H. Steam line break with SGTR. (SGTR-stm. gen. tube rupture)	Break Inside Containment Low SG press./RCS press and high cont. press/temp. and cont. area RMS alarm. Break Outside Cont. Low SG press/RCS press. Normal cont. press. and abnormal stm. flow and/or stm. trip vlv closure and/or RMS alarms.	H. Steam line break with >50 gpm primary to secondary leakage and indication of fuel damage.	N. Break Inside Cont. Hi cont. press/temp and cont. RMS alarms and air ejector/LD RMS alarm. Break Outside Cont. Cont. RMS alarm and air ejector/LD RMS alarm. Normal cont. press.		
					I. All alarms (annunciators) lost and significant abnormal transients in progress	I. Direct observation		
					J. Actual or estimated releases corresponding to >50 mrem/hr WB dose rate or >250 mrem/hr thyroid at the site boundary.	J. Stack RMS >$3x10^5$ CPM and hi range stack monitor < 1R/hr or atmos. S.D. dose >20 mr/hr and <400 mr/hr or hatch RMS 5R to 100 R/hr or ET's detect levels of: 50-1000 mr/hr dose rate or 1-131 concentration of $5x10^{-7}$ to $1x10^{-5}$ µc/cc. (SD-steam dump)	J. RMS detect levels corresponding to 1 to 5R WB dose or 5 to 25 REM thyroid dose at site boundary. BRAVO RMS detect levels corresponding to > 5R WB dose or >25 REM thyroid dose at site boundary. ALPHA	J. Stack RMS off-scale and hi range stack monitor >1R/hr or atmos. SD> 400 mR/hr or hatch RMS >100 R/hr or ET's detect dose rates >1000 mR/hr or I-131 concentrations > 1×10^{-5} µCi/cc. Stack RMS offscale and hi range stack monitor >5R/hr or atmos. SD> 2000 mR/hr or hatch RMS >500 R/hr or ET's detect dose rates >5000 mR/hr or I-131 concentrations > 5×10^{-5} µCi/cc.
RADIATION HAZARD	A. Instantaneous radiological release rate tech. spec. limit exceed. DELTA	A. Stack or liquid effluent RMS >alarm setpoint or analysis indicates discharge limits were exceeded.	A. Radiological effluent >10 times tech. spec. instantaneous limits.	A. Stack or liquid effluent RMS > 10 times alarm setpoint for more than 15 min.	A. Actual or estimated releases corresponding to >50 mrem/hr WB dose rate or >250 mrem/hr thyroid at the site boundary.	A. Stack RMS >$3x10^5$ CPM and hi range stack monitor <1R/hr or atmos. SD dose >20 mr/hr and <400 mr/hr or hatch RMS 5R to 100 R/hr or ET's detect levels of 50-1000 mr/hr or 1-131 concentration of $5x10^{-7}$ to $1x10^{-5}$ µci/cc. (SD-steam dump)	A. RMS detect levels corresponding to 1 to 5R WB dose or 5 to 25 REM thyroid dose at site boundary. BRAVO RMS detect levels corresponding to > 5R WB dose or >25 REM thyroid dose at site boundary. ALPHA	A. Stack RMS offscale and hi range stack monitor >1R/hr or atmos. SD >400 mR/hr or hatch RMS >100 R/hr or ET's detect dose rates >1000 mR/hr or I-131 concentrations > $1x10^{-5}$ µci/cc. Stack RMS offscale and hi range stack monitor > 5R/hr or atmos. SD> 2000 mR/hr or hatch RMS >500 R/hr or ET's detect dose rates >5000 mR/hr or I-131 concentrations > 5×10^{-5} µCi/CC.

EMERGENCY ACTION LEVELS

	UNUSUAL EVENT		ALERT CHARLIE-ONE		SITE AREA EMERGENCY CHARLIE-TWO		GENERAL EMERGENCY	
	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL
RADIATION HAZARD	B. Sudden fuel damage ECHO	B. LD RMS and chemistry sample results	B. Severe loss of fuel cladding (greater than 1% fuel failures.)	B. Chemistry sampling indicated >135 uci/ml I-131 in reactor coolant				
			C. Rapid failure of SG tubes.	C. Air ejector/stack RMS alarm and auto start backup CHG pump and/or core cooling initiated.				
			D. High radiation level or high airborne contamination which indicates a severe degradation in the control of radioactive material.	D. Area radiation monitors or continuous air monitor offscale or >1000 times normal reading.				
			E. Fuel handling accident with release of radioactivty to containment or spent fuel building.	E. Cont/spent fuel building RMS alarm and direct observation of fuel handling accident.	E. Major damage to spent fuel in cont. or fuel building.	E. Cont/spent fuel building RMS >1000 mR/hr and direct observation of fuel handling accident.		
							F. Loss of coolant accident and failure to isolate cont. or potential to rupture cont. BRAVO	F. LOCA indications and failure cont. isolation vlv's indicated by control board indicator lights or visual observation and subsequent depressurization of cont. or cont. hydrogen concentration >4% or cont. press. >40 psig.
STEAM LINE BREAK	A. Unplanned depressurization of secondary side. ECHO	A. SG press. 100 psi lower than expected or stm. dump vlv/SG safety vlv open/stuck open.						
			S. Steam line break with SGTR. (SGTR-stm. gen. tube rupture)	B. Break Inside Cont. Low SG press./RCS press. and high cont. press/temp and cont. area RMS alarm. Break Outside Cont. Low SG press/RCS press. Normal cont. press. and abnormal stm flow and/or stm trip vlv closure and/or RMS alarms.	B. Steamline break and indication fuel damage & SGTR. (STGR-stm. gen. tube rupture)	B. Break Inside Cont. Hi cont. press/temp and cont. RMS alarms and air ejector/LD RMS alarm. Break Outside Cont. Cont. RMS alarm and air ejector/LD RMS alarm. Normal cont. press.		

EMERGENCY ACTION LEVELS

	UNUSUAL EVENT		ALERT CHARLIE-ONE		SITE AREA EMERGENCY CHARLIE-TWO		GENERAL EMERGENCY	
	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL
LOSS OF POWER	A. Total loss of offsite power or loss of onsite AC power. ECHO	A. 480-4160 low voltage alarms or emergency diesels declared inoperable.	A. Loss of offsite power and loss of all onsite AC power.	A. 480-4160 low voltage alarms and emergency diesels declared inoperable and all offsite breakers open.	A. Total loss of offsite power and loss of all onsite AC power for more than 15 min.	A. 480-4160 low voltage alarm and both diesels inoperable.	A. Potential for station black out to last >2 hours. BRAVO	A. PRZ empty-RCP seal temp >250° - small loca, No RCS, Make-up available. Core melt.
			B. Loss of all onsite DC power.	B. Loss of battery power.	B. Loss of all onsite DC power for more than 15 min.	B. Battery trouble alarms.	B. Station blackout >2 hrs. BRAVO	B. Core melt indications
			C. Rapid gross failure of one steam generator tube with loss of offsite power.	C. Air ejector/stack RMS alarm and auto start backup CH6. pump and/or core cooling initiated.	D. Rapid failure of steam generator tube(s) and simultaneous total loss of offsite power.	D. Air ejector/stack/ SGBD RMS alarm and auto start of backup CHG pump and core cooling initiated and 480-4160 low voltage alarm.		
EQUIPMENT FAILURE	A. Failure of a reactor coolant system safety or relief valve to close. ECHO	A. PORV open alarm or indicating lights acoustical monitor alarm and/or PRT hi press/temp.						
	B. Loss of engineering safety features or fire protection system function requiring shutdown by tech. specs. ECHO	B. As determined by tech. specs limiting condition for operation.	B. Loss of equipment needed for cold shutdown.	B. Unable to satisfy tech. spec. for systems required for cold shutdown.	B. Complete loss of any equipment needed for plant hot shutdown.	B. Unable to satisfy tech. spec. for systems required for hot shutdown.		
			C. Failure of reactor protection system to initiate and complete a reactor trip.	C. More than one control rod stuck out of core. High or increasing temp./ press. or positive start-up rate and increasing neutron level.	C. Transient requiring operation of shutdown systems with failure to trip.	C. Power or intermediate range indicating >1% power and rod bottom lights not on.		
	D. Indication or alarms on process or effluent parameters not functional in CR to an extent requiring plant shutdown or other significant loss of assessment or communication capability. ECHO	D. Direct observation	D. Loss of all control room alarms or annunciators.	D. Direct observation	D. All alarms (annunciators) lost and significant abnormal transients in progress.	D. Direct observation		
			E. Coolant pump seizure leading to fuel failure.	E. RCP BKR trips on hi current and LD RMS and samples indicate fuel damage				

EMERGENY ACTION LEVELS

JUN 3 0 1982

	UNUSUAL EVENT		ALERT CHARLIE-ONE		SITE AREA EMERGENCY CHARLIE-TWO		GENERAL EMERGENCY	
	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL
EQUIPMENT FAILURE					E. Actual or estimated releases corresponding to >50 mrem/hr WB dose rate or >250 mrem/hr thyroid dose rate at site boundary.	E. Stack RMS >$3x10^5$ CPM and hi range stack monitor <1R/hr or atmos. SD dose >20 mr/hr and <400 mr/hr or hatch RMS 5 to 100 R/hr or ET's detect levels of 50-1000 mr/hr dose rate or I-131 concentration of $5x10^{-7}$ to 1×10^{-5} µci/cc. (SD-stm. dump)	E. RMS detect levels corresponding to 1 to 5R WB dose or 5 to 25 R thyroid dose at site boundary. BRAVO RMS detect levels corresponding to > 5R WB dose or >25 REM thyroid dose at site boundary. ALPHA	E. Stack RMS offscale and hi range stack monitor >1R/hr or atmos. SD>400 mR/hr or hatch RMS > 100 R/hr or ET's detect dose rates >1000 mR/hr or I-131 concentrations > 1×10^{-3} µCi/cc. Stack RMS offscale and hi range stack monitor >5R/hr or atmos. SD >2000 mR/hr or hatch RMS >500 R/hr or ET's detect dose rates >5000 mR/hr or I-131 concentrations > 5×10^{-3} µCi/cc.
SECURITY THREAT	A. Security threat or attempted entry or attempted sabotage. ECHO	A. Notification by security of a security threat.	A. Ongoing security compromise.	A. Notification by security of an ongoing security compromise.	A. Imminent loss of physical control of the plant.	A. Notification by security of the imminent loss of physical control of the plant.	A. Loss of physical control of the facility. BRAVO	A. Notification by security.
FIRE	A. Fire within the plant lasting more than 10 minutes. ECHO	A. Fire alarms or fire pump start alarms or fire system flow alarms or visual observation.	A. Fire potentially affecting safety systems.	A. Fire alarms or fire pumps start alarms or fire system flow alarms or visual observation.	A. Fire compromising the functions of safety systems.	J. Indications of actual fire (fire detection panel alarm(s); firepump running alarm and visual observation.		
NATURAL PHENOMENON	A. Natural phenomenon being experienced or projected beyond usual levels. ECHO	A. Sustained wind speeds >75 mph or flood alarm or direct observation or seismic monitors >5.5 on the Richter Scale or notification by external agencies.	A. Severe natural phenomena being experienced or projected.	A. Direct observation Earthquake >OBE levels Tornado striking facilty. Hurricane winds near design basis level	A. Severe natural phenomena being experienced or projected with plant not in cold shutdown.	A. Direct observation Earthquake >SSE level Flood, low water, tsunami, hurricane surge, seiche >design level or failure of protection of vital equipment at lower levels.		
OTHER HAZARDS	A. Other hazards being experienced which could endanger the facility ECHO	A. Direct observation or notification. . Airplane crash onsite or unusual activity over facility. . Near or onsite explosion. . Near or onsite toxic or flammable gas release. . Turbine rotating component failure causing rapid plant shut down.	A. Significant hazards being experienced which could affect plant safety.	A. Visual observation . Aircraft crash on facility. . Missile impacts from whatever source on facility. . Explosion damage to facility affecting plant operation. . Enter into facility of uncontrolled toxic or flammable gases. . Turbine failure causing casing penetration.	A. Other hazards being experienced or projected with plant not in cold shutdown.	A. Visual observation . Aircraft crash affecting vital structures by impact or fire. . Severe damage to safe shutdown equipment from missiles or explosion. . Entry of uncontrolled flammable gases into vital areas. . Entry of uncontrolled toxic gases into vital areas where lack of access to area constitutes safety problem.		

EMERGENCY ACTION LEVELS

JUN 3 0 1982

	UNUSUAL EVENT		ALERT CHARLIE-ONE		SITE AREA EMERGENCY CHARLIE-TWO		GENERAL EMERGENCY	
	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL	INITIATING CONDITION	EMERGENCY ACTION LEVEL
OTHER HAZARDS	B. Other plant conditions exist that warrant increased awareness on the part of a plant operating staff or state and/or local offsite authorities or requiring plant shutdown under tech. spec. requirements or involve other than normal controlled shutdown. ECHO	B. Direct observation	B. Other plant conditions exist that warrent activation of the TSC and EOC and other key emergency personnel on standby.	B. Direct observation	B. Other plant conditions exist that warrant activation of emergency centers and monitoring teams or a precautionary notification to the public near the site.	B. Direct observation		
	C. Unplanned depressurization of secondary side. ECHO	C. SG press 100 psi lower than expected or stm. dump. vly/SG safety vlv open/stuck open.						
	D. Transportation of contaminated injured person from site to offsite hospital. ECHO	D. Direct observation.						
					E. Evacuation of CR and control of shutdown systems not established from local stations in 15 min.	E. Direct observation		