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VERMONT YANKEE NUCLEAR POWER STATION

EMERGENCY RESPONSE PREPAREDNESS EXERCISE

1993 INGESTION PATHWAY EXERCISE MANUAL

EXERCISE MATERIAL

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1.0 INTRODUCTION

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1.1 BACKGROUND

1.1 BACKGROUND

In further support of emergency preparedness around the Vermont Yankee Nuclear Power Station, an ingestion pathway exercise is scheduled for the week of April 25, 1993. This exercise will follow the off-hours, unannounced, 1993 full participation exercise.

The objectives for the ingestion pathway exercise, which are to be addressed at least once during a six-year period per FEMA REP 14, have been used to develop this scenario. The State of Vermont will fully participate and the State of New Hampshire and the Commonwealth of Massachusetts plan to partially participate in this exercise.

These states have provided a Lead Controller for the exercise. The Lead Controller assisted in the development, review, and implementation of the exercise by working with the Scenario Development Group and Exercise Controller Organization.

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1.2 EXERCISE SCHEDULE

1.2 EXERCISE SCHEDULE

A. Controller/Observer Briefing

Date: April 21, 1993

Time: 9:00 a.m.

Location: Vermont Yankee Training Center in Brattleboro, VT

Purpose: Controller/Observer Briefing on Exercise Activities and Assignments

Attendees: Controllers and Observers

B. FEMA Briefing

Date: April 25, 1993

Time: 2:00 p.m.

Location: Quality Inn in Brattleboro, VT

Purpose: FEMA Briefing of Exercise Activities

Attendees: FEMA Evaluators, State Controllers, Exercise Coordinator

C. Ingestion Pathway Activities

1. State Accident Assessment and Support Staff Personnel

Date: Immediately Following the Plume Exposure Exercise

Time: TBD

Location: State Emergency Operations Centers

Purpose: Player Debrief and Transition from the Plume Exposure Exercise

Attendees: All designated Accident Assessment Emergency Response Personnel for the Ingestion Pathway Exercise

2. Field Monitoring and Sampling Teams and Laboratory Operations and Analysis Personnel

Date: TBA (Day After Plume Exposure Exercise)

Time: 8:00 a.m. - 3:00 p.m.

Location: Sampling Points in the Ingestion Pathway Emergency Planning Zone and the Vermont Department of Health Laboratory (Burlington, Vermont)

Purpose: Ingestion Pathway Sampling and Laboratory Operations and Analysis

Attendees: Designated Emergency Response Field Monitoring Teams and Laboratory Personnel for Vermont

3. State Accident Assessment and Support Staff Personnel

Date: TBD (Day After Plume Exposure Exercise)

Time: 1:00 p.m. - 3:00 p.m.

Location: State Emergency Operations Center

Purpose: Ingestion Pathway PAR Decision Making

Attendees: All Designated Accident Assessment Emergency Response Personnel for the Ingestion Pathway Exercise

4. State Emergency Management, Accident Assessment, and Support Staff Personnel

Date: TBD (Two Days After Plume Exposure Exercise)

Time: 9:00 a.m. - 3:00 p.m.

Location: State Emergency Operations Centers

Purpose: Ingestion Pathway PAD Implementation and Follow-Up PAR Decision Making

Attendees: All Ingestion Pathway Exercise Personnel

D. Ingestion Pathway Exercise Debriefings

1. Field Monitoring and Sampling Teams and Laboratory Operations and Analysis Personnel

Date: TBA (One Day After the Plume Exposure Exercise)

Time: Immediately Following the Exercise

Location: Field Monitoring and Sampling Team Muster Area and the Department of Health Laboratory

Purpose: Player Debriefing

Attendees: Key Players and Controller/Observers

2. State Emergency Management, Accident Assessment, and Support Staff Personnel

Date: TBA (Two Days After Plume Exposure Exercise)

Time: Immediately Following the Exercise

Location: At the Emergency Operation Centers

Purpose: Player Debriefing

Attendees: Key Players, Controller/Observers, and FEMA Evaluators

3. Overall/Ingestion Pathway Exercise Critique

Date: TBD

Time: TBD

Location: TBD

Purpose: Overall Critique of the Exercise Activities

Attendees: Designated Controllers/Observers

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1.3 ABBREVIATIONS AND DEFINITIONS

1.3 ABBREVIATIONS AND DEFINITIONS

A. Abbreviations

- ARCA - Area(s) Requiring Corrective Action
- ARM - Area Radiation Monitor
- EAL - Emergency Action Level
- ENS - Emergency Notification System
- EOC - Emergency Operations Center
- EPZ - Emergency Planning Zone
- FEMA - Federal Emergency Management Agency
- GE - General Emergency
- NAS - Nuclear Alert System
- NG - Noble Gases
- NRC - Nuclear Regulatory Commission
- PAD - Protective Action Decision(s)
- PAG - Protective Action Guide(s)
- PAR - Protective Action Recommendation(s)
- PVS - Plant Vent Stack
- Rx - Reactor
- SRM - Site Recovery Manager
- VY - Vermont Yankee
- VYNPC - Vermont Yankee Nuclear Power Corporation
- VYNPS - Vermont Yankee Nuclear Power Station
- YNSD - Yankee Nuclear Services Division

B. Definitions

- Committed Dose - The dose that will be received over a period of 50 years from the ingestion or inhalation of a particular quantity of a radionuclide or a specific mix of radionuclides.

- Controller - A member of an exercise control group. Each Controller may be assigned to one or more activities or functions for the purpose of keeping the action going according to a scenario, resolving differences, supervising and assisting as needed.

- Critique - A meeting of key participants in an exercise, usually held shortly after its conclusion, to identify weaknesses and deficiencies in emergency response capabilities.

- Derived Response Level - A calculated concentration of a particular radionuclide in a particular medium (e.g., food) that will produce a dose equal to a protective action guide.

- Emergency Action Levels - Specific instrument readings, system levels or event observation and/or radiological levels which initiate event classification, notification procedures, protective actions, and/or the mobilization of the emergency response organization. These are specific threshold readings or observations indicating system failures or abnormalities.

- Emergency Operations Center - Areas designated by state/local representatives as Emergency Plan assembly areas for their respective staffs.

- Emergency Planning Zones - The areas for which planning is recommended to assure that prompt and effective actions can be taken to protect the public in the event of an accident. The two zones are the 10-mile radius plume exposure pathway zone and the 50-mile radius ingestion exposure pathway zone.

- Exercise - A demonstration of the adequacy and content of the emergency plan, implementing procedures, methods, and equipment.

- Full P ticipation Exer .e - An exercise which tests as much of the licensee, state, and local plans as is reasonably achievable without mandatory public participation and inconvenience.

- General Emergency - An emergency classification which is defined as actual or imminent substantial core degradation or melting with potential for loss of containment integrity.

- Observer - A member of an exercise control group. Each Observer may be assigned to one or more activities or functions for the purpose of evaluating, recording, and reporting the strengths and weaknesses, and making recommendations for improvement.

- Protective Action - Those emergency measures taken to effectively mitigate the consequences of an accident by minimizing the radiological exposure that would likely occur if such actions were not undertaken.

- Protective Action Guides - Projected dose to an individual in the general population that warrants the implementation of protective action. Specific PAG's have been recommended in terms of the level of projected dose that warrants the implementation of evacuation/sheltering, relocation, and limiting the use of contaminated food, water, or animal feed.

- Recovery - The process of reducing radiation exposure rates and concentrations in the environment to acceptable levels for unconditional occupancy or use after the emergency phase of a radiological emergency.

- Re-Entry - Temporary entry of individuals in a restricted zone under controlled conditions.

- Relocation - A protective action, taken in the post-emergency phase, through which individuals not evacuated during the emergency phase are asked to vacate a contaminated area to avoid chronic radiation exposure from deposited radioactive material.

- Return - Evacuees are allowed to reoccupy their homes and businesses on an unrestricted basis.

- Scenario - The hypothetical situation, from start to finish, in an exercise which is the theme or basis upon which the action or play of the exercise follows.

- Site - That property within the fenced boundary of Vermont Yankee which is owned by the Vermont Yankee Nuclear Power Corporation.

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2.0 OBJECTIVES AND EXTENT OF PLAY

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2.1 OBJECTIVES AND EXTENT OF PLAY

STATE OF VERMONT

24. **POST-EMERGENCY SAMPLING.** Demonstrate the use of equipment and procedures for the collection and transportation of samples from areas that received deposition from the airborne plume.

Extent of Play:

The sampling teams will demonstrate all sample collection procedures as well as procedures for preventing cross contamination. The particular types of samples to be collected and the areas from which they are collected may be determined in advance. Prior contact will be made to secure access to properties.

Teams will demonstrate the proper equipment to collect samples of soil, grass, forage, stored feed, leafy vegetables, local produce, milk and surface water.

All activities related to sample transportation, storage and record maintenance and documentation will be demonstrated for a representative number of samples.

The Department of Health in coordination with the state Office of Emergency Management and state response agencies will provide direction on where field sampling should take place. The teams will demonstrate equipment and supplies used for field sampling (e.g. scoops, shovels, collection bags, containers, ID labels, etc). They will demonstrate equipment used for measuring background radiation for field personnel, sample location and individual samples. Each team will take at least one sample from predetermined sampling locations. These samples will be delivered to the muster and collection point for teams and then to the State of Vermont Health Laboratory for analysis. Actual sample transport from the muster/collection point to the health laboratory will occur one time only.

ARCA 87-8, 87-10, 87-11

25. **LABORATORY OPERATIONS.** Demonstrate laboratory operations and procedures for measuring and analyzing samples.

The laboratories' capability to process samples will be demonstrated. The use of laboratory equipment, laboratory grade analytical instruments suitable for determining radioisotopes present and levels of radioactivity in samples, as well as the training of personnel to use the equipment will be demonstrated by analyzing prepackaged environmental samples.

The State of Vermont Health Laboratory will receive and identify all incoming ingestion samples for analysis. The results will be transmitted to the Department of Health staff located at the state EOC.

ARCA: 87-12, 87-13, 87-14

26. **INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING.** Demonstrate the capability to project dose to the public for the ingestion pathway and to recommend protective measures.

The State Department of Health, with other state agencies will demonstrate the capability to make appropriate Protective Action Decisions (PADs) using data provided by exercise controllers. The data consists of meteorologic conditions from the emergency phase, release isotopic composition and radiation levels found in field monitoring samples and DOE flyover results. All data will be in the form normally available either from the field monitoring teams, the laboratory and DOE.

PADS will also be developed using the laboratory sample analysis results of the food and agricultural.

ARCA: None

27. **INGESTION EXPOSURE PATHWAY - PROTECTIVE ACTION IMPLEMENTATION.** Demonstrate the capability to implement protective actions for ingestion exposure pathway.

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Extent of Play:

The State will identify and utilize current information regarding dairy and agricultural food producers/processors within the ingestion pathway for the implementation of protective actions.

Development of measures and strategies for the implementation of ingestion pathway EPZ protective actions will be demonstrated by protective action messages to the general public and food producers and processors. Actual broadcast of messages will be simulated.

Demonstration of this objective will also include selection of appropriate instructional material (preprinted and to be printed) for distribution within the ingestion pathway EPZ at the time of the emergency. Actual printing and distribution of materials will be simulated.

State agencies will demonstrate the capability to control, restrict or prevent distribution of contaminated foodstuffs by commercial businesses by issuing administrative orders through health or agricultural agencies. Communications and coordination with agencies responsible for enforcing food controls within the ingestion pathway EPZ will be demonstrated, but actual communications with food producers and processors will be simulated.

28. RELOCATION, RE-ENTRY, AND RETURN - DECISION MAKING. Demonstrate the capability to develop decisions on relocation, re-entry, and return.

The identification of areas requiring Relocation of the general public will be demonstrated by comparing simulated measurements to decision criteria. Assessments will be made based on Doe Flyover data provided by controllers and field monitoring exposure rate readings. State personnel responsible for accident assessment will demonstrate the capability to use this data to plot on a map the location of the area from which the population should be Relocated (the Restricted zone).

The decision criteria and strategies that are followed to allow Re-entry into controlled areas will be demonstrated at the State EOC in a group setting discussion with representatives from all major state organizations. Decisions will be made regarding the location of control points and policies.

Responsible agencies will use simulated environmental measurements provided by controllers to identify the location of the boundaries of areas to which Return is permitted.

Demonstrated decision making regarding assistance to individuals who are affected by the emergency will be demonstrated at the state EOC in a group setting discussion with representatives from all major state organizations. Discussions will be held regarding priorities, necessary actions and implementation.

The coordination of decision making with the various state organizations and the other states will be demonstrated.

29. RELOCATION, RE-ENTRY, AND RETURN - IMPLEMENTATION. Demonstrate the capability to implement relocation, re-entry, and return.

Extent of Play:

Relocation efforts will focus on those individuals not previously evacuated from the restricted zone and those evacuated populations unable to return because of contamination. Relocation activities will be demonstrated through internal meetings, briefings, discussions and coordination with various state organizations in a group setting.

The State will demonstrate control of Emergency Workers and the public who re-enter the restricted zone. Actions required for the implementation of reentry will be demonstrated through discussions with state agencies at the EOC.

The State will demonstrate the capability to return populations that were evacuated during the emergency phase. Return activities will be demonstrated through internal meetings, briefings, discussions and coordination with various state organizations in a group setting.

The State will demonstrate the coordination of this implementation with the other states.

Activities demonstrated in this objective will be in accord with the State Plan.

ARCA: 82-15

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2.2 OBJECTIVES AND EXTENT OF PLAY

STATE OF NEW HAMPSHIRE

OBJECTIVE #24 (27) :

POST EMERGENCY SAMPLING :

Demonstrate the use of equipment and procedures for the collection and transportation of samples from areas that received deposition from the airborne plume.

EXTENT OF PLAY PLUME EXPOSURE :

This objective will be demonstrated in conjunction with the ingestion phase of the exercise.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE PLUME EXPOSURE PATHWAY PHASE :

N/A.

EXTENT OF PLAY INGESTION PATHWAY :

This objective will be demonstrated at the State EOC by a discussion of sampling strategy. A late May/early June sampling time frame will be imposed for exercise purposes by a controller message. Deployment of sampling teams will be simulated.

Actual deployment of sampling teams will occur in conjunction with the Seabrook Station ingestion pathway exercise to be conducted in December, 1994. The sampling procedures and personnel for both Seabrook Station and Vermont Yankee are the same.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE INGESTION PATHWAY PHASE :

State EOC.

AREAS REQUIRING CORRECTIVE ACTION :

The State EOC will demonstrate the ability to develop data from plume monitoring activities for sample collection team dispatch. Transmission of this data to the IFO will be simulated. Use of plume monitoring data as a basis for dispatching New Hampshire sampling teams will be demonstrated in this manner.
(SEE ARCAS 87-29,87-44,87-46).

The ARCAs listed below will be addressed in the 1994 Ingestion Pathway exercise for Seabrook Station.

Sampling team equipment which requires calibration will be marked to indicate currency of calibration.
(SEE ARCA 87-39).

Sampling teams will be provided complete sampling kits per the NHRERP.
(SEE ARCA 87-40)

Sampling teams will demonstrate familiarity with the set-up and operation of sampling equipment.
(SEE ARCA 87-41).

Sampling teams will demonstrate familiarity with procedures for taking water samples.
(SEE ARCA 87-42).

Sampling team will demonstrate familiarity with taking radiation ground-level readings.
(SEE ARCA 87-43).

Sampling teams will demonstrate the ability to read dosimeters at prescribed intervals per the NHRERP.
(SEE ARCA 87-45).

OBJECTIVE #25 (28) :

LABORATORY OPERATIONS:

Demonstrate laboratory operations and procedures for measuring and analyzing samples.

EXTENT OF PLAY PLUME EXPOSURE PATHWAY :

The State Laboratory in Concord will demonstrate this objective in conjunction with the ingestion pathway phase of the exercise.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE PLUME EXPOSURE PATHWAY PHASE :

N/A.

EXTENT OF PLAY INGESTION PATHWAY :

The State Laboratory in Concord will simulate this objective. A discussion of laboratory procedures and capabilities will be held at the State EOC during the Ingestion Pathway portion of the exercise. A late May early June time frame will be assumed for exercise purposes.

Demonstration of laboratory capabilities will occur in conjunction with the Seabrook Station ingestion pathway exercise to be conducted in December, 1994. The laboratory procedures and personnel for both Seabrook Station and Vermont Yankee are the same.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE INGESTION PATHWAY PHASE :

N/A

AREAS REQUIRING CORRECTIVE ACTION :

None cited.

OBJECTIVE #26 (29) :

INGESTION EXPOSURE PATHWAY-DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING :

Demonstrate the capability to project dose to the public for the Ingestion Pathway and to recommend protective measures.

EXTENT OF PLAY PLUME EXPOSURE PATHWAY :

The activity required to demonstrate this objective will occur during the Ingestion Pathway phase of the exercise.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE PLUME EXPOSURE PATHWAY PHASE :

N/A.

EXTENT OF PLAY INGESTION PATHWAY :

The activity required to demonstrate this objective will occur during three separate phases of the exercise. The State EOC Accident Assessment Team will develop a post accident monitoring plan to identify the plume foot print. This will occur at the end of the plume exposure pathway phase of the exercise on Day One of the exercise.

A late May/early June time frame will be assumed for exercise purposes.

On day Two of the exercise the DPHS Accident Assessment Team will convene at the State EOC. DOE fly over results, one meter dose rates, monitoring team data and some preliminary laboratory results (soil samples) will be available for them to determine projected milk concentration/response levels and 1, 2, and 50 year dose projections. A summary table will then be provided for remaining samples. The table will compare the samples against the PAR limits already determined. With the aid of this data the accident assessment staff will develop milk pathway protective action recommendations and Relocation / Return protective action recommendations. An agricultural sampling plan will be completed for days 2-3. This will conclude exercise activity on Day Two.

Play will continue at the State EOC on Day Three simulating days 2 and 4 using a time jump. The State EOC will be fully staffed for an ingestion pathway scenario. Play will begin with a discussion of the implementation of previously determined milk, relocation/return protective actions. A discussion will also be initiated to identify requirements for emergency re-entry. Appropriate news releases will be developed which reflects the actions taken. Upon completion of these activities a time jump will occur to exercise day four.

Day three laboratory results will be provided to the accident assessment team for analysis. Various agricultural sample data including water milk vegetables and soil will be included. Once the accident assessment team has demonstrated the ability to evaluate this data, summary tables will be provided with results already compiled and agricultural PARs will be developed and implemented. Appropriate news releases will be developed. A long term sampling plan will be discussed and an appropriate media release will be developed. This will end exercise play.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE INGESTION PATHWAY PHASE :

STATE EOC.

AREAS REQUIRING CORRECTIVE ACTION :

None cited.

OBJECTIVE #27 (30) :

INGESTION EXPOSURE PATHWAY-PROTECTIVE ACTION IMPLEMENTATION :

Demonstrate the capability to implement protective actions for Ingestion Exposure Pathway.

EXTENT OF PLAY PLUME EXPOSURE PATHWAY:

This objective will be demonstrated in conjunction with the Ingestion Pathway phase of the exercise.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE PLUME EXPOSURE PATHWAY PHASE :

N/A.

EXTENT OF PLAY INGESTION PATHWAY :

See extent of play for objective #26.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE INGESTION PATHWAY PHASE :

STATE EOC.

AREAS REQUIRING CORRECTIVE ACTION :

None cited.

OBJECTIVE # 28 (32) :

RELOCATION, RE-ENTRY, AND RETURN-DECISION MAKING :

Demonstrate the capability to develop decisions on relocation, re-entry, and return.

EXTENT OF PLAY :

This objective will be demonstrated in conjunction with the Ingestion Pathway phase of the exercise.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE PLUME EXPOSURE PATHWAY PHASE :

N/A.

EXTENT OF PLAY INGESTION PATHWAY PHASE :

See extent of play for objective #26.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE INGESTION PATHWAY PHASE :

STATE EOC.

AREAS REQUIRING CORRECTIVE ACTION :

None cited.

OBJECTIVE #29 (33) :

RELOCATION, RE-ENTRY, AND RETURN-IMPLEMENTATION :

Demonstrate the capability to implement relocation, re-entry, and return.

EXTENT OF PLAY PLUME EXPOSURE PATHWAY :

This objective will be demonstrated in conjunction with the Ingestion Pathway phase of the exercise.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE PLUME EXPOSURE PATHWAY PHASE :

N/A.

EXTENT OF PLAY INGESTION PATHWAY :

See extent of play for objective #26.

FACILITIES DEMONSTRATING THIS OBJECTIVE DURING THE INGESTION PATHWAY PHASE :

STATE EOC.

AREAS REQUIRING CORRECTIVE ACTION :

None cited.

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2.3 OBJECTIVES AND EXTENT OF PLAY

COMMONWEALTH OF MASSACHUSETTS

MASSACHUSETTS OBJECTIVES AND EXTENT-OF-PLAY FOR THE
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Obj. No.	REP-14 Objectives	MA	Local
26	**INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING.** Demonstrate the capability to project dose to the public for the ingestion pathway and to recommend protective measures. EXTENT OF PLAY: On Day Two of the exercise the MDPH Accident Assessment Team will convene at the State EOC. DOE fly over results, one meter dose rates, monitoring team data and some preliminary laboratory results (soil samples) will be available for them to determine projected milk concentration/response levels and 1, 2, and 50 year dose projections. A summary table will then be provided for remaining samples. The table will compare the samples against the PAR limits already determined. With the aid of this data the accident assessment staff will develop milk pathway protective action recommendations and Relocation/Return protective action recommendations. This will conclude exercise activity on Day Two. AREAs: None	Y	N
27	**INGESTION EXPOSURE PATHWAY - PROTECTIVE ACTION IMPLEMENTATION.** Demonstrate the capability to implement protective actions for ingestion exposure pathway. EXTENT OF PLAY: Play will continue at the state EOC on Day Three simulating days 2, 4, and 8 using time jumps. The state EOC will be fully staffed for an ingestion pathway scenario. Play will begin with a discussion of the implementation of previously determined milk, relocation/return protective actions. A discussion will also be initiated to identify requirements for emergency re-entry. An agricultural sampling plan will be completed for days 2-3 and appropriate news releases will be developed which reflect the actions taken. Upon completion of these activities a time jump will occur to exercise day four. AREAs: None	Y	N

MASSACHUSETTS OBJECTIVES AND EXTENT-OF-PLAY FOR THE
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Obj. No.	REP-14 Objectives	MA	Local
28	**RELOCATION, RE-ENTRY, AND RETURN DECISION MAKING.** Demonstrate the capability to develop decisions on relocation, re-entry, and return. EXTENT OF PLAY: All activities associated with the identification of areas requiring Relocation by comparing simulated measurements to decision criteria, will be completed as they would in an actual emergency. Assessments will be made based on simulated data developed as part of the scenario. Demonstration of the decision making regarding assistance to individuals who are affected by the emergency will be accomplished at the state EOC in a group setting with representatives of all major state organizations. The conditions facing individuals will be determined by decisions made under the above criteria. Discussions will be held regarding the actions that will be needed, priorities, and the processes for implementation. Demonstration of the coordination of decision making with other organizations will be accomplished with representatives of all major state organizations. Based on field survey information, decision makers will determine the relocation criteria. The corresponding iso-dose rate line will be drawn on appropriate maps. The area of interest will be discusses in regards to the effect on the public, and special population groups. Population estimates, relocation time estimates, and host community requirements, as well as traffic control will be discussed. ARCA: None	Y	N

MASSACHUSETTS OBJECTIVES AND EXTENT-OF-PLAY FOR THE
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Obj. No.	REP-14 Objectives	MA	Local
29	**RELOCATION, RE-ENTRY, AND RETURN - IMPLEMENTATION.** Demonstrate the capability to implement relocation, re-entry, and return. EXTENT OF PLAY: Relocation efforts will be demonstrated by focusing on those individuals not previously evacuated from the restricted zone; and for those evacuated populations who are unable to return because of contamination. Actions are demonstrated through internal meetings, briefings, discussions and coordination. ARCA: None	Y	N

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3.0 EMERGENCY RESPONSE FACILITIES

3.0 EMERGENCY RESPONSE FACILITIES

1. State of Vermont Emergency Operations Center, Waterbury, Vermont.

2. State of Vermont Department of Health Laboratory, Burlington, Vermont.

3. State of New Hampshire Emergency Operations Center, Concord, New Hampshire.

4. Commonwealth of Massachusetts Emergency Operations Center, Framingham, Massachusetts.

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4.0 EXERCISE GUIDELINES

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4.1 EXERCISE GUIDELINES

4.1 EXERCISE GUIDELINES

A. Purpose

This manual provides guidance for conducting the 1993 VYNPS Ingestion Pathway Exercise. It provides the framework for demonstrating emergency response capabilities, conducting the exercise and evaluating response activities.

B. Concepts of Operations and Control of the Exercise

An Exercise Coordinator has been appointed by Vermont Yankee management to oversee all exercise activities. The Exercise Coordinator is responsible for approving the objectives and developing the scenario time sequence. The Exercise Coordinator is also responsible for the selection and training of the personnel required to conduct and evaluate the exercise.

Vermont Yankee will supply Controllers and Observers for major locations where an emergency response action will be demonstrated. Prior to the exercise, the Controllers and Observers will be provided with the appropriate materials necessary for their assigned function. The material will include any maps, data, and messages to be used and forms for documenting and evaluating observed activities.

In each facility where an activity takes place, the Controller will make judgment decisions to keep the action going in accordance with the scenario timeline. The Controllers will also provide guidance to Observers and resolve minor problems which may occur. If a serious problem arises, an Observer should first contact the Facility Controller who will then contact the Exercise Coordinator for guidance or resolution of the problem. All major requests for scenario modifications or holding periods must be cleared through the Exercise Coordinator. Controllers also have the authority to resolve scenario-related problems which may occur during the exercise.

Observers for the exercise will observe the players as they perform their assigned emergency response functions. Observers are responsible for being knowledgeable in the area of their assigned function. The Observers will critique the effectiveness of the emergency response actions taken during the exercise and will also provide a written evaluation to their Facility Controller (see Section 9).

The exercise initial conditions will be provided to representatives of the states located in the EOCs after the plume exposure exercise is completed. Additional data will be provided by Controllers at the times indicated in the exercise sequence of events, or when requested by the players.

C. General Guidance for the Conduct of the Exercise

1. Simulating Emergency Response Actions

Since the exercise is intended to demonstrate actual capabilities as realistically as possible, participants should act as they would during an actual emergency.

2. Avoiding Violations of Laws

Violation of laws is not justifiable during the exercise. To implement this guideline the following actions must be taken:

a. All Controllers, Observers, and potential participants must be specifically informed of the need to avoid violating any federal, state and local laws, regulations, ordinances, statutes and other legal restrictions. The orders of all police, sheriffs or other authorities shall be followed as appropriate.

b. Participants will not direct illegal actions to be taken by other participants or members of the general public.

c. Participants will not intentionally take illegal actions when responding to scenario events. Specifically, local traffic laws (i.e., speed limits) will be observed.

3. Avoiding Personnel and Property Endangerment

All participants will be instructed to avoid endangering property (public or private), other personnel responding to the events, members of the general public, animals and the environment.

4. Actions to Minimize Public Inconvenience

It is not the intent, nor is it desirable, to effectively train or test the public response during the conduct of the exercise. Public inconvenience is to be avoided.

The conduct of an exercise could arouse public concern that an actual emergency is occurring. It is important that conversations that can be monitored by the public (radio, loudspeakers, etc.) be prefaced and conclude with the words, "THIS IS A DRILL; THIS IS A DRILL."

D. Emergency Response Implementation and Operations

1. Initial and Follow-Up Notification

Players will be prestaged for the activities of the Ingestion Pathway Exercise.

E. Exercise Termination

The exercise will be terminated by the Exercise Coordinator when all emergency response actions have been completed in accordance with the exercise time sequence and exercise objectives.

The following steps will be implemented to terminate the exercise:

1. The Exercise Coordinator will obtain information from the Controllers regarding the status of player actions and the demonstration of the exercise objectives.

2. The Controllers are responsible for informing the Exercise Coordinator of their facility status and whether the emergency response actions and state objectives have been satisfactorily observed.

3. Upon receipt of information from the Controllers, the Exercise Coordinator will inform the key state players that all exercise observations have been completed and that the exercise can be terminated.

4. A coordinated decision to terminate the exercise will be made between the key state players and the Exercise Coordinator.

The exercise may also be terminated if an actual emergency condition develops coincident with the exercise.

In the event that an actual emergency should occur, the following actions should be taken:

1. The Controllers will notify the Exercise Coordinator.

2. A decision will be made by the Exercise Coordinator regarding the completion of the exercise.

3. The Exercise Coordinator will be responsible for temporarily halting the exercise until such time a decision is made.

4. If the final decision is to cancel the exercise, the Exercise Coordinator will be responsible for directing the activities of all exercise participants, as well as for the notification of FEMA.

5. If the final decision is to continue the exercise, the Exercise Coordinator is responsible for informing all Controllers and Observers of any projected changes to the expected response action(s).

6. The Exercise Coordinator will direct the organization as to the appropriate action required to restore the exercise sequence.

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4.2 PLAYER INSTRUCTIONS

4.2 PLAYER INSTRUCTIONS

The Vermont Yankee Ingestion Pathway Exercise will be conducted on the two (2) days following the unannounced full-participation plume exposure exercise. The successful demonstration of emergency response capabilities will depend on player response and protocol. General guidelines for the exercise are as follows:

1. Exercise participants include Players, Controllers, Observers, NRC and FEMA Evaluators, and an Exercise Coordinator. Controllers will provide players with command and message cards to initiate emergency response actions. Observers may evaluate player actions in addition to Controllers. Controllers and Observers will be identified by badges. All player actions will be coordinated by Controllers. A FEMA evaluator will also be present.

   An integrated approach will be used to demonstrate emergency response capabilities. All players will be asked to work together as they would in an actual emergency. The State of Vermont will be fully participating and the State of New Hampshire and Commonwealth of Massachusetts will be partially participating in this ingestion pathway exercise.

2. Always identify yourself by name and function to the Controllers, Observers, and Evaluators. Wear a name tag if one is provided.

3. Initial Conditions will be provided and explained to the players by the Controllers.

4. You may ask the Controller/Observer for information such as:
   a. Conditions after the accident:
      - History of the accident
      - Initial field measurements
      - General weather conditions
   b. Airborne data at the location of the state field survey teams after a sample has been appropriately taken.
   c. Counting efficiency of all counting equipment.
   d. Activity from nose swabs or skin contamination surveys.

5. You may not ask the following from the Controller/Observer:
   a. Information contained in procedures, maps, or instructions.
   b. Judgments as to which procedures should be used.
   c. Data which will be made available later in the day.
   d. What the Controller/Observer would do if he were a player.
   e. Assistance in performing actions in this exercise.
   f. Assistance in carrying out calculations.

6. Play out all actions, as much as possible, in accordance with your Emergency Plan and Procedures as if it were an actual emergency. If an action or data is to be simulated, a Controller or Observer will provide players with appropriate direction.

7. Always identify and discuss your actions to the Controllers and Observers. State your data out loud as you are recording it. For your own benefit, it is recommended that you play out your actions as much as possible, as if it were an actual emergency. It is to your advantage to exercise as many appropriate response actions as possible.

8. Periodically speak out loud, identifying your key actions and decisions to the Controller/Observer. This may seem artificial, but it will assist the evaluators and is to your benefit.

9. If you are in doubt about completing a response action, ask your Controller or Observer for clarification. The Controller/Observer will not prompt or coach you. Emergency response actions must not place exercise participants in any potentially hazardous situations.

10. The Controller/Observer will periodically issue messages or instructions designed to initiate response actions. You should accept these messages immediately. They are essential to the proper conduct of the exercise.

11. If the Controller intervenes in your response actions and recommends you redirect or reconsider your play actions, it is for a good reason. His direction may be essential to the overall success of the exercise for all participating groups.

12. If you disagree with your Controller or Observer, discuss your problem with him. However, the Controller's final decisions must be followed.

13. Respond to questions in a timely manner.

14. Answer questions directed at you by NRC and FEMA Evaluators. If you do not know the answer, refer them to a lead player or Controller/Observer.

15. You must play as if radiation levels are actually present in accordance with the information you receive. This may require you to wear additional dosimeters, observe emergency radiation protection practices, and to be aware of and minimize your radiation exposures.

16. Controllers/Observers/Evaluators are exempt from simulated radiation levels and other emergency conditions. Do not let this confuse you or cause you to act unwisely.

17. Always begin and end all communications with the words "THIS IS A DRILL," during the exercise so that these communications are not confused with an actual emergency.

18. Keep a list of items which you believe will improve your plans and procedures. Provide your input to a lead player or Controller/Observer immediately after the exercise. A critique will follow the exercise. Areas for improvement or weaknesses when corrected will improve the overall emergency response capability.

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5.0 EXERCISE SCENARIO

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5.1 PLAYER DEBRIEF AND TRANSITION FROM THE PLUME EXPOSURE EXERCISE

5.1 PLAYER DEBRIEF AND TRANSITION FROM THE PLUME EXPOSURE EXERCISE

A. Controller Instructions

Immediately following the plume exposure exercise, the key accident assessment players will be debriefed relative to their relocation and environmental sampling approach. The EOC Controller at the state EOCs will moderate discussions with the accident assessment personnel relative to the details of the approach and its implementation.

The player-controller discussions should be limited to relocation and environmental sampling approaches (e.g., Will the initial samples focus on Dairy Processing Center(s)? What sampling strategy will be used to determine the projected deposition areas?) The controller should also request players identify high priority samples that would be transported to the state laboratory.

All sampling approaches should be limited to the number and type of teams that would be available in an actual emergency. Player discussion should also include how evacuated areas would be handled for sampling and limited re-entry (e.g., dairy farmers feeding and milking cattle).

The controller should make available or review the following reference information to the key accident assessment players:

- Initial Conditions (Section 5.2);
- Weather forecast for Vermont Yankee EPZ (Section 7); and
- Actual protective action decisions made during the plume exposure exercise.

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5.2 INITIAL CONDITIONS

5.2 INITIAL CONDITIONS

(THIS INFORMATION WILL BE PROVIDED TO THE PLAYERS AFTER THE PLUME EXPOSURE EXERCISE IS TERMINATED.)

1. For the purposes of the exercise scenario timeline and data, T = 0 is the time the release of radioactive material was terminated. The present scenario time is T = +2 hours. THE DATE SHOULD BE ASSUMED TO BE JUNE 1, 1993.

2. The release of radioactive material from the Vermont Yankee Nuclear Power Station is terminated and no further releases are anticipated.

3. The radionuclide composition of the samples of radioactive material collected from the environment after release termination was estimated as follows:

Radionuclide	Percent of Total Sample Activity
Mo-99	0.4
Tc-99m	0.3
Te-132	4.0
I-131	17.0
I-132	23.0
I-133	30.0
I-135	19.0
Cs-134	3.0
Cs-136	0.5
Cs-137	2.0
Ba-140	0.5
La-140	0.6

4. The nuclear reactor is shut down. All related systems are stable.

5. The protective actions taken by the states in the plume exposure exercise remain in effect.

6. The general weather conditions since the release termination has been rain with winds from the southeast direction.

(THIS INFORMATION WILL BE PROVIDED TO THE PLAYERS PRIOR TO THE BEGINNING OF THE FIRST DAY OF INGESTION PATHWAY EXERCISE ACTIVITIES.)

1. For the purposes of the exercise scenario timeline and data, T = 0 is the time the release of radioactive material was terminated. The present scenario time is T = +21 hours. THE DATE SHOULD BE ASSUMED TO BE JUNE 2, 1993.

2. The release of radioactive material from the Vermont Yankee Nuclear Power Station was terminated.

3. The nuclear reactor is shut down. All related systems are stable.

4. The protective actions taken by the states in the plume exposure exercise remain in effect.

5. The general weather conditions since the release termination has been rain with winds from the southeast direction.

6. The field and environmental sampling programs were discussed when the release was terminated.

(THIS INFORMATION WILL BE PROVIDED TO THE PLAYERS AT THE START OF THE DECISION MAKING AND PAR DEVELOPMENT PORTION OF THE INGESTION PATHWAY EXERCISE.)

1. The present scenario time is T = +26 hours. THE DATE SHOULD BE ASSUMED TO BE JUNE 2, 1993.

2. The release of radioactive material from the Vermont Yankee Nuclear Power Station was terminated.

3. The radionuclide composition of the samples of radioactive material collected from the environment after release termination was estimated as follows:

Radionuclide	Percent of Total Sample Activity
Mo-99	0.4
Tc-99m	0.3
Te-132	4.0
I-131	17.0
I-132	23.0
I-133	30.0
I-135	19.0
Cs-134	3.0
Cs-136	0.5
Cs-137	2.0
Ba-140	0.5
La-140	0.6

4. The nuclear reactor is shut down. All related systems have been stable since yesterday.

5. The protective actions taken by the states during the plume exposure exercise remain in effect.

6. The relocation and environmental sampling programs were discussed when the release was terminated. Field monitoring (waist and ground level readings) and DOE flyover data have been obtained.

7. The field monitoring teams were dispatched this morning and have completed their soil sampling activities. The laboratory has completed the analysis of the soil samples and the ground deposition data is now available.

8. The National Weather Service three-day forecast is available (see Section 7).

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5.3 NARRATIVE SUMMARY

5.3 NARRATIVE SUMMARY

The VYNPS Ingestion Pathway Exercise will begin after the termination of the full-participation plume exposure exercise. Immediately after the plume exposure exercise, Controllers will debrief the accident assessment players from the states of Vermont and New Hampshire, and the Commonwealth of Massachusetts at their respective state EOC. Then, working with the accident assessment players and other state agency representatives, determine a sampling strategy for relocation and environmental sampling and analysis for the days immediately following the release. (Actual sampling and analysis will be demonstrated by the state of Vermont only.)

THIS WILL COMPLETE THE ACTIVITIES FOR THE DAY.

The state of Vermont Radiological Monitoring Team Director is then responsible for dispatching relocation and environmental sample teams from the muster area. Another controller will provide representative samples at the Vermont Department of Health Laboratory (Burlington, Vermont) for analysis. The ingestion-related activities for sample collection, sample transport, and sample analysis will be initially conducted in the morning and its results will be integrated with the overall direction, coordination, and decision-making portion of the ingestion pathway exercise that afternoon.

The ingestion pathway exercise will start with plant conditions stable, release terminated, and no additional release of radioactive material anticipated.

The morning activities (for Vermont only) will involve relocation monitoring and environmental sample collection, monitoring, transport, and analysis. At 0800, the relocation and environmental sample teams will muster to be briefed and dispatched into the field by the state of Vermont Radiological Monitoring Team Director. The Team Director will brief the teams, issue equipment and dosimetry, and dispatch the teams in accordance with direction from the state of Vermont Radiological Health Coordinator. At approximately 0830, the Health Laboratory will be provided with representative environmental samples from the

Controller and will be asked to demonstrate certain measuring and analysis techniques.

At approximately 1300, the state EOCs will be staffed by the accident assessment personnel participating in this portion of the ingestion pathway exercise. The field measurements obtained (i.e., waist and ground level and DOE flyover dose rate readings) and ground deposition results from samples collected in the morning will be integrated into the initial conditions which will be presented to the accident assessment personnel at their respective EOCs.

The sample and survey results will indicate the relocation PAG has been exceeded at certain locations within the ingestion pathway.

At 1330, the Vermont Department of Health Laboratory will demonstrate the communication of environmental sample analysis results from the laboratory to the state EOC.

By 1430, the states will have evaluated the sample results and determined the relocation and restricted areas PARs for the ingestion pathway. An agricultural sampling plan should have also been developed by this time.

By 1500, protective action decisions should have been developed for the affected areas. Coordination is expected between the states on the extent of the protective actions and information to be disseminated to the public.

THIS WILL COMPLETE THE ACTIVITIES FOR THE DAY.

By 0900 the next day, all state agencies involved in the ingestion pathway exercise will muster in their respective EOCs. The accident assessment personnel will present the PADs they have developed to emergency management and the EOC Staff.

By 1100, the implementation of the PADs should have been discussed. These discussions should have included establishing access control, considering re-entry into restricted areas as necessary, and embargo measures for contaminated food products.

By 1200, the states should have coordinated their PAD implementation and developed Emergency Public Information for the public.

At 1300, the accident assessment personnel will reconvene in their respective EOCs. There will be a simulated time jump and they will be given the laboratory results (from Section 6.4) for the various food products sampled and analyzed.

By 1400, they should have compared these results with the PAGs and developed follow-up PADs for these food products.

The sample results will indicate that several preventive and emergency PAGs have been reached at certain locations within the ingestion pathway emergency planning zone.

By 1500, the states should again have coordinated their PAD results, discussed its implementation, and developed Emergency Public Information for the public.

At approximately 1515, the exercise will be terminated and followed by a debrief at the state EOCs.

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5.4 SCENARIO TIME LINE

5.4 SCENARIO TIME LINE

Scenario Time	Clock Time	
T+2:00	1300	Plume exposure exercise ends.
T+2:00	1300	Debrief players and transition to the IP exercise.
T+4:00	1500	PLAY IS COMPLETED FOR THE DAY.
T+21:30	0830	Deploy relocation and environmental sample teams for monitoring, sample collection, and transport.
T+22:00	0900	Provide environmental samples to VT State Laboratory personnel for analysis.
T+26:00	1300	EOCs staffed by accident assessment players. Players briefed and given field monitoring readings and ground deposition data.
T+26:30	1330	Communicate Vermont State Laboratory sample analysis results to EOC.
T+27:00	1400	Complete evaluation of the sample results and determination of relocation and restricted area PARs.
T+27:30	1430	Develop protective action decisions (PADs) for the affected areas.
T+28:00	1500	PLAY IS COMPLETED FOR THE DAY.
T+28:00	0900	Accident assessment players present the PADs to emergency management.
T+30:00	1100	Complete discussions of PAD implementation.
T+31:00	1200	Complete state coordination of PAD implementation and EPI development.
T+32:00	1300	Forty-eight (48) hour time jump.
T+80:00	1300	Laboratory results for food products given to accident assessment players.
T+81:00	1400	Complete development of follow-up PADs.
T+82:00	1500	Complete state coordination on following PADs, EPI development, and long-term sampling discussions.
T+82:15	1515	Exercise terminated/debriefing initiated.

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5.5 DETAILED SEQUENCE OF EVENTS

5.5 DETAILED SEQUENCE OF EVENTS

Clock Time	Scenario Time	Event Summary	Message
1300	T+2:00	The plume exposure exercise ends.	EOC-M-1
1300	T+2:00	Debrief and transition accident assessment players at state EOCs on activities associated with the ingestion pathway exercise. This should include a discussion of the sampling strategy to be used by each state.	EOC-C-1
1500	T+4:00	THE ACTIVITIES FOR THE DAY ARE COMPLETE.	
0800	T+21:00	Brief the Radiological Monitoring Team Director and field monitoring team members on player instructions and initial conditions.	VT-M-1
		The Team Director should brief field monitoring teams on the environmental sampling approach as determined by the state accident assessment players.	
		NOTE: Controllers should identify the sampling team members and introduce them to the federal evaluators.	
0830	T+21:30	Field monitoring teams have been briefed on the extent of play expected, type of samples to be collected, location, and simulated conditions in the field.	
		Field monitoring teams perform inventories of their sampling kits and prepare for dispatch.	
		Brief the players at the Vermont Department of Health Laboratory on player instructions and provide them with initial conditions.	VTLAB-M-1
0900	T+22:00	Provide the laboratory analysis players at the Vermont Department of Health Laboratory with the sample box containing prepackaged (nonspiked) environmental samples for measuring and analysis.	VTLAB-M-2

Clock Time	Scenario Time	Event Summary	Message
		Field monitoring teams (state of Vermont only) are dispatched to perform sampling and to transport samples to the Health Laboratory (Objective 24).	
		The Vermont Department of Health Laboratory will process and analysis the samples (Objective 25).	
1300	T+26:00	Brief the EOC staff players at the state EOC with player instructions and provide them with initial conditions.	EOC-M-2
		National Weather Service three-day forecast is available upon request (see Section 7.2).	
		Provide the radiological assessment players at the state EOC with field monitoring readings, DOE flyover data, and ground deposition data.	
		Issue Message EOC-M-3A, B, or C as appropriate if the state issued the recommendation to shelter lactating animals and place on stored feed during the plume exposure exercise.	EOC-M-3A EOC-M-3B EOC-M-3C
1315	T+26:15	IF NOT ALREADY DEMONSTRATED, A TEAM SHOULD BE DIRECTED TO TRANSPORT A SAMPLE TO THE HEALTH LABORATORY.	VTEOC-C-1
		NOTE: The transport mechanism should be identified to the FEMA observer.	
1330	T+26:30	Accident assessment players are reviewing field monitoring readings and laboratory data.	
		Field monitoring data indicates the presence of radioactive deposition in certain locations beyond the plant site.	
		IF NOT ALREADY DEMONSTRATED, THE VERMONT DEPARTMENT OF HEALTH LABORATORY SHOULD COMMUNICATE SAMPLE ANALYSIS RESULTS TO THE STATE EOC.	VTLAB-C-1

Clock Time	Scenario Time	Event Summary	Message
		Accident assessment players at the EOC are: 1. Performing projected first integrated dose calculations. 2. Reviewing the results of calculations and determining the relocation and restricted area PARs (Objectives 26 and 28). 3. Discussing actions that would be taken based upon the results of calculations. Also, discussing interface with other state agencies concerning re-entry/relocation of evacuees. 4. Developing protective action decisions for the affected areas. Coordination should occur between the states on the extent of protective actions and information to be disseminated to the public.	
1445	T+27:45	IF NOT ALREADY DEVELOPED, THE ACCIDENT ASSESSMENT PERSONNEL SHOULD BE DIRECTED TO DEVELOP PROTECTIVE ACTION DECISIONS FOR THE AFFECTED AREAS.	EOC-C-2
1500	T+28:00	THE ACTIVITIES FOR THE DAY ARE COMPLETE.	
0900	T+28:00	All state agencies will muster in their respective EOCs. Protective action decisions will be presented to emergency management and the EOC staff.	
1100	T+30:00	Protective action decision implementation has been discussed and is being coordinated between state agencies at the EOC (Objectives 27 and 29).	
1130	T+30:30	IF NOT ALREADY DISCUSSED, THE DIRECTOR OF THE EMERGENCY MANAGEMENT'S STAFF SHOULD BE DIRECTED TO DISCUSS PROTECTIVE ACTION IMPLEMENTATION.	EOC-C-3

Clock Time	Scenario Time	Event Summary	Message
1200	T+31:00	States have coordinated their implementation plans and Emergency Public Information (EPI) has been developed at the EOC.	
		The EPI has been reviewed and approved.	
		Simulated release of EPI for the public has been disseminated.	
1300	T+32:00	The accident assessment personnel have reconvened in their respective EOCs.	
		The accident assessment personnel are given the laboratory results from the previous food products.	EOC-M-4 EOC-M-5
**	T+80:00	Simulated 48-hour time jump.	
1400	T+81:00	The accident assessment personnel have compared their calculated results with the PAGs and developed follow-up PADs for these food products (Objective 26).	
1500	T+82:00	States will have again coordinated their PAD results, discussed their implementation, and developed EPI (Objective 27).	
		The accident assessment personnel at the state EOC develop a the long-term Environmental Sampling Program.	
1515	T+82:15	The exercise is terminated and followed by debrief at the state EOCs.	

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6.0 RADIOLOGICAL DATA

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6.1 FIELD MONITORING INSTRUCTIONS AND ASSUMPTIONS

Section 6.1 - Field Monitoring Instructions and Assumptions

Section 6.2 - Field Monitoring Maps and Data

Figure 6.2-1 - VY IP Exercise Deposition Footprint

Figure 6.2-2 - DOE Flyover Map

- Sample Contact Readings (in cpm)
- External Exposure and Count Rates (in mR/hr and cpm)
- Ground Deposition (in uCi/m^2)
- Results of Exposure Rate/Ground Deposition Calculation to Determine Integrated Doses (Relocation Zone)

  Note: These results should not be made available to the players until they have adequately demonstrated their capability to perform these calculations.

Section 6.3 - Laboratory Analysis Instructions and Assumptions

Section 6.4 - Laboratory Analysis Data

- Grass Analyses Concentrations (in uCi/kg)
- Forage Analyses Concentrations (in uCi/kg)
- Leafy Vegetables Analyses Concentrations (in uCi/kg)
- Local Produce Analyses Concentrations (in uCi/kg)
- Milk Analyses Concentrations (in uCi/l)
- Surface Water Concentrations (in uCi/l)
- Results of Concentrations Versus Derived Response Levels to Determine if Preventive/Emergency PAGs were exceeded.

  Note: These results should not be made available to the players until they have adequately demonstrated their capability to perform these calculations.

Section 6.5 - Sample Laboratory Analysis Formats

6.1 FIELD MONITORING INSTRUCTIONS AND ASSUMPTIONS

Ground deposition levels have been developed as a function of distance from the site and time after the accident. A map depicting seven (7) zones is provided in this manual (see Figure 6.2-1). The zones represent the off-site areas which are affected by radioactive deposition. Also included in this manual are off-site data tables which provide the field monitoring data for the various zones for various times after the accident. During this exercise, controllers for field monitoring teams will use Figure 6.2-1 in conjunction with the data on Pages 6.2-1 - 6.2-3 to provide field monitoring teams with external exposure rates for various locations. Field monitoring team controllers should use Figure 6.2-1 to locate the position of the team, then go to the appropriate pages and provide the data for the zone to the players. Prior to the exercise, training will be provided to the off-site monitoring team controllers on the use of this manual.

The following assumptions were used to calculate the field monitoring data.

1. The assumed area deposition-to-waist level exposure rate conversion factors are based on the values in EPA 400-R-92-001, Table 7-1.

2. The open window sample contact readings were obtained using the following conversion factors:

Milk and Water Samples:	700 cpm per µCi/l
Grass, Forage, Leafy Vegetables and Local Produce Samples:	400 cpm per µCi/kg

   The conversions were taken from Evaluation of Radiation Emergencies and Accidents: Selected Criteria and Data, IAEA Technical Reports Series No. 152.

3. Soil sample concentrations have been converted to ground deposition concentrations (Pages 6.2-7 through 6.2-9).

The following are specific actions which field monitoring team controllers should observe during the ingestion pathway exercise:

1. Field monitoring teams following their procedures. This will include the initial equipment check.

2. Teams will be reading their instruments while enroute to the assigned monitoring location. Figure 6.2-1 and Pages 6.2-1 - 6.2-3 can be used to provide the appropriate radiological data.

3. All surface and waist level readings include background levels.

4. Dose rates within the contaminated areas are less than 100 mR/hr. When providing readings for the team members' pocket dosimeter, adjust the exposure levels for waist-high readings that are provided in Pages 6.2-1 - 6.2-3 according to the approximate time spent in a given zone.

5. Be certain you understand what equipment the teams have available for use and the scales associated with these instruments. Record this information to ensure that you do not provide them with data that exceeds the range of their equipment.

   When in areas where dose rates are less than 1 mR/hr, check the lower range of the team's dose rate survey meter. If this lower range is 1 mR/hr or greater, you should advise the team that the dose rate in a particular area is less than 1 mR/hr.

6. For purposes of this exercise, it is assumed that the background exposure rate is equal to 10 micro-R/hr (i.e., .01 mR/hr) and that the background count rate is 50 cpm.

7. If necessary, exposure rate can be converted to cpm by using 600 cpm per mR/hr for the state of Vermont equipment.

8. If the teams take air samples, the filters should be transported to a low background area for counting. The teams should be advised that no activity above background is detectable.

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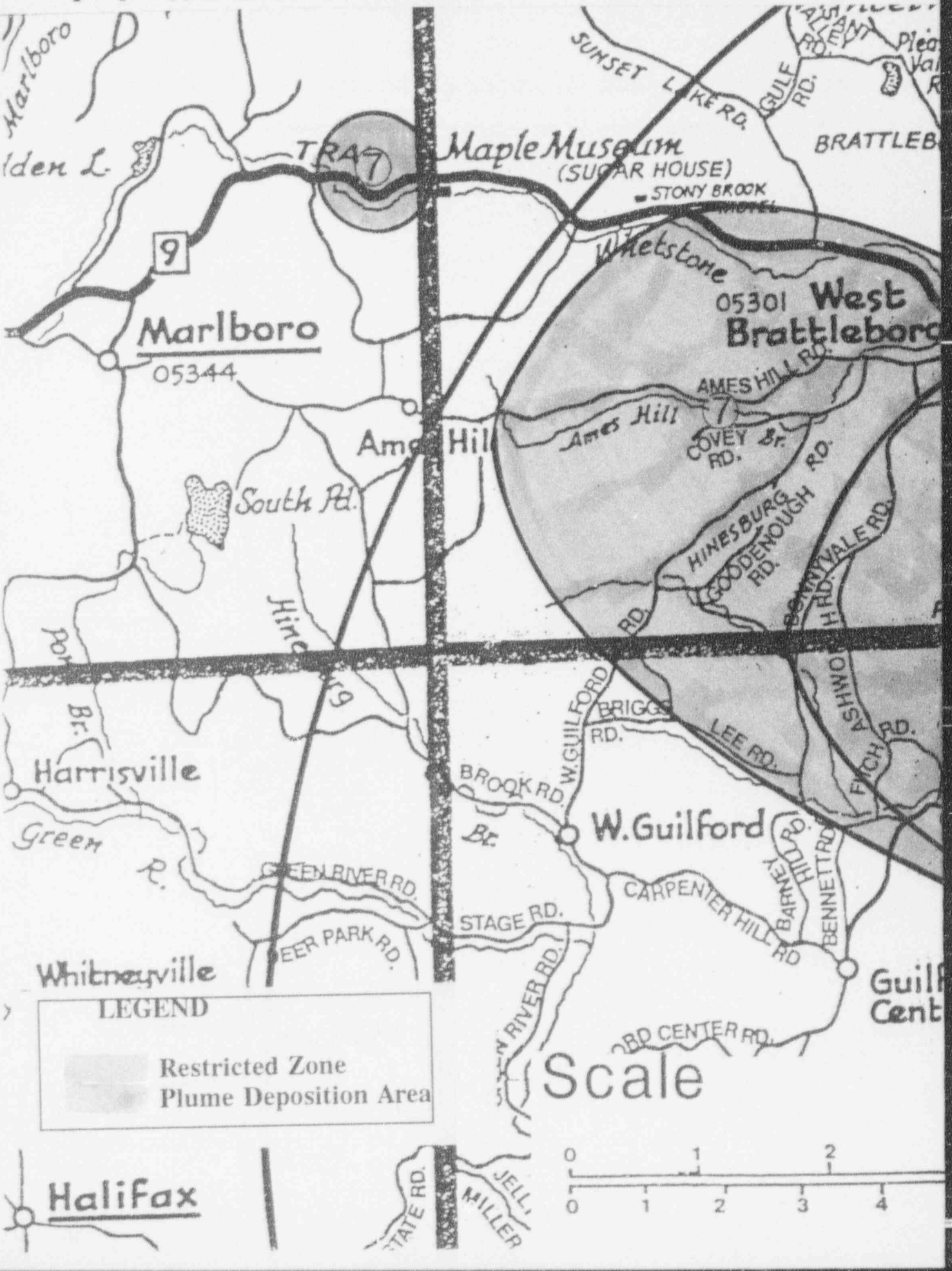
6.2 FIELD MONITORING MAPS AND DATA

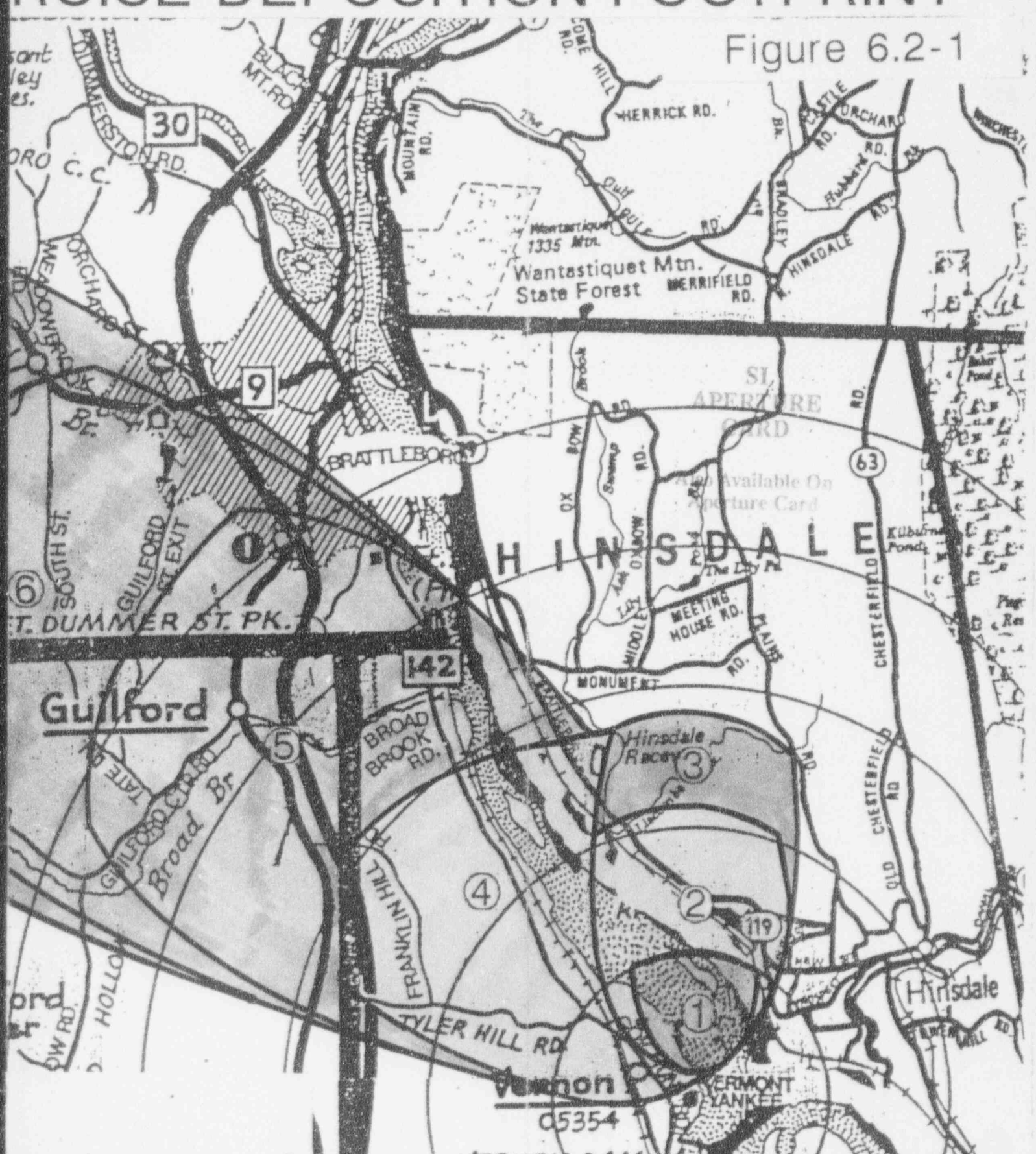
(Note: Scenario Time T=0 is the time the release was terminated)

VY INGESTION PATHWAY EXE



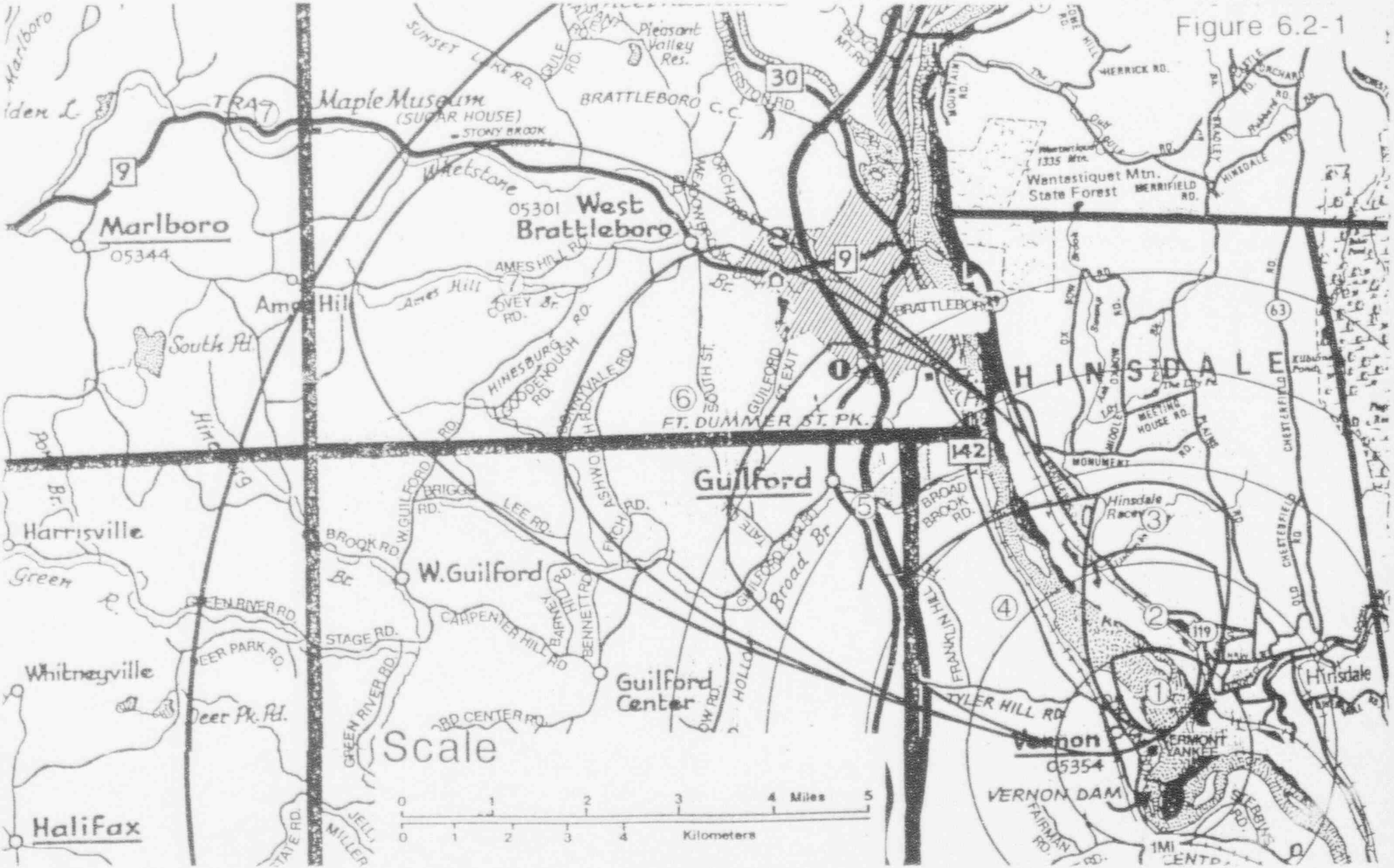
RCISE DEPOSITION FOOTPRINT

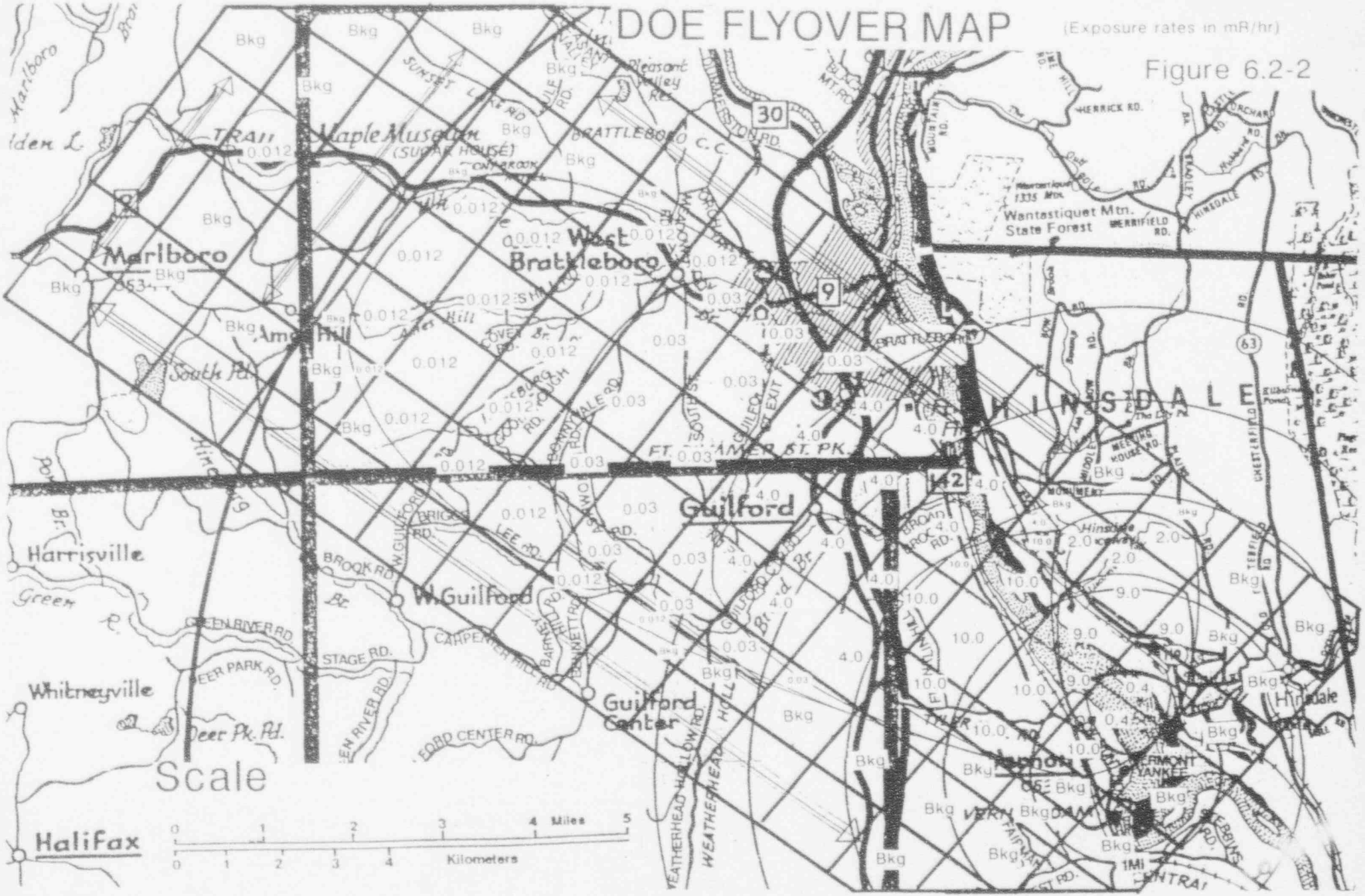
Figure 6.2-1



VY INGESTION PATHWAY EXERCISE DEPOSITION FOOTPRINT

Figure 6.2-1




DOE FLYOVER MAP
(Exposure rates in mR/hr)
Figure 6.2-2
Marlboro
West Brattleboro
Maple Museum
(SUGAR HOUSE)
Wantastiquet Mtn.
State Forest
HINSDALE
Guilford
W. Guilford
Guilford Center
Harrisville
Whitneyville
Halifax
Scale
0 1 2 3 4 Miles 5
0 1 2 3 4 Kilometers

EXTERNAL EXPOSURE RATES (mR/hr)

(T = +2 hours - 26 hours)
Background Exposure Rate = 0.01 mR/hr
Background Count Rate = 50 cpm
1 mR/hr = 3000 cpm

	One Meter (Waist-Level) Readings		5 Centimeter (Ground-Level) Readings	
Zone	mR/hr	cpm	mR/hr	cpm
1	3.7E-01	1.1E+03	4.1E-01	1.2E+03
2	9.0E+00	2.7E+04	9.9E+00	3.0E+04
3	2.1E+00	6.3E+03	2.3E+00	6.9E+03
4	9.4E+00	2.8E+04	1.0E+01	3.1E+04
5	3.6E+00	1.1E+04	4.0E+00	1.2E+04
6	2.8E-02	8.4E+01	3.1E-02	9.2E+01
7	1.2E-02	<Bkg.	1.3E-02	<Bkg.

EXTERNAL EXPOSURE RATES (mR/hr)

(T = +26 hours - 50 hours)
Background Exposure Rate = 0.01 mR/hr
Background Count Rate = 50 cpm
1 mR/hr = 3000 cpm

	One Meter (Waist-Level) Readings		5 Centimeter (Ground-Level) Readings	
Zone	mR/hr	cpm	mR/hr	cpm
1	1.7E-01	5.1E+02	1.9E-01	5.6E+02
2	4.2E+00	1.3E+04	4.6E+00	1.4E+04
3	9.4E-01	2.8E+03	1.0E+00	3.1E+03
4	4.3E+00	1.3E+04	4.7E+00	1.4E+04
5	1.6E+00	4.8E+03	1.8E+00	5.3E+03
6	1.4E-02	<Bkg.	1.5E-02	<Bkg.
7	<Bkg.	<Bkg.	<Bkg.	<Bkg.

EXTERNAL EXPOSURE RATES (mR/hr)

(T = +50 hours - 74 hours)
Background Exposure Rate = 0.01 mR/hr
Background Count Rate = 50 cpm
1 mR/hr = 3000 cpm

	One Meter (Waist-Level) Readings		5 Centimeter (Ground-Level) Readings	
Zone	mR/hr	cpm	mR/hr	cpm
1	1.3E-01	3.9E+02	1.4E-01	4.3E+02
2	3.2E+00	9.6E+03	3.5E+00	1.1E+04
3	7.4E-01	2.2E+03	8.1E-01	2.4E+03
4	3.4E+00	1.0E+04	3.7E+00	1.1E+04
5	1.3E+00	3.8E+03	1.4E+00	4.2E+03
6	1.0E-02	<Bkg.	1.1E-02	<Bkg.
7	<Bkg.	<Bkg.	<Bkg.	<Bkg.

SAMPLE CONTACT READINGS (cpm)
(T = +2 hours - 26 hours)

Zone	Grass	Forage	Leafy Vegetables	Produce	Milk	Surface Water	Soil
1	1.1E+04	4.0E+03	5.0E+03	8.0E+03	<Bkg.	<Bkg.	1.6E+02
2	2.7E+05	9.6E+04	1.2E+05	1.9E+05	<Bkg.	<Bkg.	3.8E+03
3	6.3E+04	2.2E+04	2.8E+04	4.4E+04	<Bkg.	<Bkg.	8.8E+02
4	2.9E+05	1.0E+05	1.3E+05	2.0E+05	<Bkg.	<Bkg.	4.0E+03
5	1.1E+05	3.8E+04	4.8E+04	7.6E+04	<Bkg.	<Bkg.	1.5E+02
6	8.7E+02	3.0E+02	3.8E+02	6.1E+02	<Bkg.	<Bkg.	<Bkg.
7	1.1E+02	<Bkg.	5.0E+01	8.0E+01	<Bkg.	<Bkg.	<Bkg.

SAMPLE CONTACT READINGS (cpm)
(T = +26 hours - 50 hours)

Zone	Grass	Forage	Leafy Vegetables	Produce	Milk	Surface Water	Soil
1	5.1E+03	1.8E+03	2.2E+03	3.6E+03	1.3E+02	<Bkg.	7.2E+01
2	1.3E+05	4.5E+04	5.6E+04	9.0E+04	3.2E+03	<Bkg.	1.8E+03
3	2.9E+04	1.0E+04	1.2E+04	2.0E+04	7.1E+02	<Bkg.	4.0E+02
4	1.3E+05	4.6E+04	5.7E+04	9.2E+04	3.3E+03	<Bkg.	1.8E+03
5	4.9E+04	1.7E+04	2.1E+04	3.4E+04	1.2E+03	<Bkg.	6.8E+02
6	4.3E+02	1.5E+02	1.9E+02	3.0E+02	<Bkg.	<Bkg.	<Bkg.
7	5.2E+01	<Bkg.	<Bkg.	<Bkg.	<Bkg.	<Bkg.	<Bkg.

SAMPLE CONTACT READINGS (cpm)
(T = +50 hours - 74 hours)

Zone	Grass	Forage	Leafy Vegetables	Produce	Milk	Surface Water	Soil
1	4.1E+03	1.4E+03	1.8E+03	2.8E+03	<Bkg.	<Bkg.	5.7E+01
2	9.7E+04	3.4E+04	4.2E+04	6.8E+04	<Bkg.	<Bkg.	1.4E+03
3	2.2E+04	7.8E+03	9.7E+03	1.6E+04	<Bkg.	<Bkg.	3.1E+02
4	1.0E+05	3.5E+04	4.4E+04	7.1E+04	<Bkg.	<Bkg.	1.4E+03
5	3.8E+04	1.3E+04	1.7E+04	2.7E+04	<Bkg.	<Bkg.	5.4E+02
6	3.0E+02	1.1E+02	1.3E+02	2.1E+02	<Bkg.	<Bkg.	<Bkg.
7	<Bkg.	<Bkg.	<Bkg.	<Bkg.	<Bkg.	<Bkg.	<Bkg.

GROUND DEPOSITION (uCi/m*2)
(T = +2 hours - 26 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	8.0E-02	6.0E-02	8.0E-01	3.4E+00	4.6E+00	6.0E+00	3.8E+00	6.0E-01	1.0E-01	4.0E-01	1.0E-01	1.2E-01	2.0E+01
2	1.9E+00	1.4E+00	1.9E+01	8.2E+01	1.1E+02	1.4E+02	9.1E+01	1.4E+01	2.4E+00	9.6E+00	2.4E+00	2.9E+00	4.8E+02
3	4.4E-01	3.3E-01	4.4E+00	1.9E+01	2.5E+01	3.3E+01	2.1E+01	3.3E+00	5.5E-01	2.2E+00	5.5E-01	6.6E-01	1.1E+02
4	2.0E+00	1.5E+00	2.0E+01	8.5E+01	1.2E+02	1.5E+02	9.5E+01	1.5E+01	2.5E+00	1.0E+01	2.5E+00	3.0E+00	5.0E+02
5	7.6E-01	5.7E-01	7.6E+00	3.2E+01	4.4E+01	5.7E+01	3.6E+01	5.7E+00	9.5E-01	3.8E+00	9.5E-01	1.1E+00	1.9E+02
6	6.0E-03	4.5E-03	6.0E-02	2.6E-01	3.5E-01	4.5E-01	2.9E-01	4.5E-02	7.5E-03	3.0E-02	7.5E-03	9.0E-03	1.5E+00
7	8.0E-04	6.0E-04	8.0E-03	3.4E-02	4.6E-02	6.0E-02	3.8E-02	6.0E-03	1.0E-03	4.0E-03	1.0E-03	1.2E-03	2.0E-01

GROUND DEPOSITION (uCi/m^2)
(T = +26 hours - 50 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	4.9E-02	5.8E-04	5.2E-01	2.7E+00	3.0E+00	1.6E+00	7.3E-02	5.4E-01	8.3E-02	3.6E-01	8.2E-02	5.8E-02	9.0E+00
2	1.2E+00	1.5E-02	1.3E+01	6.6E+01	7.4E+01	4.1E+01	1.8E+00	1.3E+01	2.1E+00	9.0E+00	2.1E+00	1.5E+00	2.2E+02
3	2.7E-01	3.2E-03	2.9E+00	1.5E+01	1.7E+01	9.0E+00	4.1E-01	3.0E+00	4.6E-01	2.0E+00	4.6E-01	3.2E-01	5.0E+01
4	1.3E+00	1.5E-02	1.3E+01	6.8E+01	7.6E+01	4.1E+01	1.9E+00	1.4E+01	2.1E+00	9.2E+00	2.1E+00	1.5E+00	2.3E+02
5	4.7E-01	5.5E-03	4.9E+00	2.5E+01	2.8E+01	1.5E+01	6.9E-01	5.1E+00	7.8E-01	3.4E+00	7.7E-01	5.5E-01	8.5E+01
6	4.1E-03	4.8E-05	4.3E-02	2.2E-01	2.5E-01	1.4E-01	6.1E-03	4.5E-02	6.9E-03	3.0E-02	6.8E-03	4.8E-03	7.6E-01
7	4.9E-04	5.8E-06	5.2E-03	2.7E-02	3.0E-02	1.6E-02	7.3E-04	5.4E-03	8.3E-04	3.6E-03	8.2E-04	5.8E-04	9.1E-02

GROUND DEPOSITION (uCi/m*2)
(T = +50 hours - 74 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	3.9E-02	4.8E-04	4.2E-01	2.4E+00	2.4E+00	7.2E-01	7.6E-03	5.4E-01	7.9E-02	3.6E-01	7.7E-02	3.7E-02	7.1E+00
2	9.2E-01	1.2E-02	1.0E+01	5.8E+01	5.8E+01	1.7E+01	1.8E-01	1.3E+01	1.9E+00	8.6E+00	1.9E+00	8.9E-01	1.7E+02
3	2.1E-01	2.7E-03	2.3E+00	1.3E+01	1.3E+01	4.0E+00	4.2E-02	2.9E+00	4.4E-01	2.0E+00	4.3E-01	2.1E-01	3.9E+01
4	9.6E-01	1.2E-02	1.0E+01	6.0E+01	6.0E+01	1.8E+01	1.9E-01	1.3E+01	2.0E+00	8.9E+00	1.9E+00	9.3E-01	1.8E+02
5	3.6E-01	4.6E-03	3.9E+00	2.3E+01	2.3E+01	6.8E+00	7.2E-02	5.1E+00	7.5E-01	3.4E+00	7.3E-01	3.5E-01	6.7E+01
6	2.9E-03	3.7E-05	3.2E-02	1.8E-01	1.8E-01	5.5E-02	5.8E-04	4.1E-02	6.0E-03	2.7E-02	5.9E-03	2.8E-03	5.3E-01
7	3.6E-04	4.6E-06	4.0E-03	2.3E-02	2.3E-02	6.8E-03	7.2E-05	5.1E-03	7.5E-04	3.4E-03	7.3E-04	3.5E-04	6.8E-02

Summary of Results of Exposure Rate/Ground Deposition Calculations to Determine Integrated Doses (Relocation Zone) for the Vermont Yankee Ingestion Pathway Exercise

ZONE	YEAR	PROJECTED INTEGRATED DOSE (in mRem)	PROTECTIVE ACTION
1	FIRST	87	NONE
2	FIRST	2102	RELOCATE
3	FIRST	498	NONE
4	FIRST	2179	RELOCATE
5	FIRST	849	NONE
6	FIRST	6	NONE
7	FIRST	2	NONE

Relocate = The Relocation Protective Action Guideline (PAG) of 2 Rem Total Integrated Dose (TID) has been exceeded.

None = The Relocation PAG has not been exceeded or approached.

Summary of Results of Exposure Rate/Ground Deposition Calculations to Determine Integrated Doses (Relocation Zone) for the Vermont Yankee Ingestion Pathway Exercise (continued)

ZONE	YEAR	PROJECTED INTEGRATED DOSE (in mRem)
1	SECOND	39
2	SECOND	946
3	SECOND	224
4	SECOND	981
5	SECOND	382
6	SECOND	2
7	SECOND	1

ZONE	YEAR	PROJECTED INTEGRATED DOSE (in mRem)
1	FIFTY	394
2	FIFTY	9567
3	FIFTY	2245
4	FIFTY	9824
5	FIFTY	3830
6	FIFTY	29
7	FIFTY	12

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6.3 LABORATORY ANALYSIS INSTRUCTIONS AND ASSUMPTIONS

The following assumptions were used to calculate the laboratory analysis data.

1. The counting time for all emergency samples is assumed to be 5 minutes since this is sufficient to detect the levels listed for the preventive PAG.

2. The Minimum Detectable Activity (MDA) for I-131 was applied to all radionuclides in the development of laboratory analysis data. The assumed MDAs for sample analysis are:

Sample Type	MDA (I-131)
Milk	7.5E-03 µCi/l
Water	7.5E-03 µCi/l
Vegetation	2.5E-02 µCi/kg
Produce	2.5E-02 µCi/kg
Grass	2.5E-02 µCi/kg
Forage	2.5E-02 µCi/kg
Soil	2.5E-02 µCi/kg

3. The radionuclides of concern are Molybdenum-99, Technetium-99m, Tellurium-132, Iodine-131, Iodine-132, Iodine-133, Iodine-135, Cesium-134, Cesium-136, Cesium-137, Barium-140, and Lanthanum-140.

4. Iodine and cesium levels in milk are assumed to be the results of a single contaminating event (based on the ground deposition), and were determined using Figures D-1 and D-2 in FEMA REP-12. Milk samples are assumed to be collected from 1000 gallon tanks. In addition, the tanks are assumed to be emptied prior to the addition of new milk.

5. Credit for dilution was taken in determining the iodine and cesium concentrations for surface water. For T+2 hours-T+26 hours, the assumed mixing layer was limited to a depth of 1 meter. For T+26 hours-T+50 hours, it was limited to a depth of 3 meters; and for T+50 hours-T+74 hours, 6 meters. The surface water concentrations apply to lakes, ponds, and reservoirs. These data do not apply to rivers, brooks, and creeks.

6. The yield of leafy vegetables/produce was assumed to be 2 kg/m^2, and the grass yield was assumed to be 0.7 kg/m^2.

7. The decrease in activity of radionuclides in the environment over time includes radiological decay and weathering. Weathering was assumed equal to a 14-day half-life.

8. The river water concentrations are all less than MDA.

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6.4 LABORATORY ANALYSIS DATA

(Note: Scenario Time T=0 is the time the release was terminated)

GRASS ANALYSES CONCENTRATIONS (uCi/kg)
(T = +2 hours - 26 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	1.1E-01	8.6E-02	1.1E+00	4.9E+00	6.6E+00	8.6E+00	5.4E+00	8.6E-01	1.4E-01	5.7E-01	1.4E-01	1.7E-01	2.9E+01
2	2.7E+00	2.1E+00	2.7E+01	1.2E+02	1.6E+02	2.1E+02	1.3E+02	2.1E+01	3.4E+00	1.4E+01	3.4E+00	4.1E+00	6.9E+02
3	6.3E-01	4.7E-01	6.3E+00	2.7E+01	3.6E+01	4.7E+01	3.0E+01	4.7E+00	7.9E-01	3.1E+00	7.9E-01	9.4E-01	1.6E+02
4	2.9E+00	2.1E+00	2.9E+01	1.2E+02	1.6E+02	2.1E+02	1.4E+02	2.1E+01	3.6E+00	1.4E+01	3.6E+00	4.3E+00	7.2E+02
5	1.1E+00	8.1E-01	1.1E+01	4.6E+01	6.2E+01	8.1E+01	5.2E+01	8.1E+00	1.4E+00	5.4E+00	1.4E+00	1.6E+00	2.7E+02
6	8.6E-03	6.4E-03	8.6E-02	3.7E-01	5.0E-01	6.4E-01	4.1E-01	6.4E-02	1.1E-02	4.3E-02	1.1E-02	1.3E-02	2.2E+00
7	1.1E-03	8.6E-04	1.1E-02	4.9E-02	6.6E-02	8.6E-02	5.4E-02	8.6E-03	1.4E-03	5.7E-03	1.4E-03	1.7E-03	2.9E-01

GRASS ANALYSES CONCENTRATIONS (uCi/kg)
(T = +26 hours - 50 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	7.0E-02	8.3E-04	7.4E-01	3.8E+00	4.2E+00	2.3E+00	1.0E-01	7.7E-01	1.2E-01	5.1E-01	1.2E-01	8.3E-02	1.3E+01
2	1.8E+00	2.1E-02	1.8E+01	9.5E+01	1.1E+02	5.8E+01	2.6E+00	1.9E+01	3.0E+00	1.3E+01	2.9E+00	2.1E+00	3.2E+02
3	3.9E-01	4.6E-03	4.1E+00	2.1E+01	2.4E+01	1.3E+01	5.8E-01	4.3E+00	6.6E-01	2.8E+00	6.5E-01	4.6E-01	7.1E+01
4	1.8E+00	2.1E-02	1.9E+01	9.7E+01	1.1E+02	5.9E+01	2.7E+00	2.0E+01	3.0E+00	1.3E+01	3.0E+00	2.1E+00	3.3E+02
5	6.7E-01	7.8E-03	7.0E+00	3.6E+01	4.0E+01	2.2E+01	9.9E-01	7.3E+00	1.1E+00	4.8E+00	1.1E+00	7.8E-01	1.2E+02
6	5.9E-03	6.9E-05	6.1E-02	3.1E-01	3.6E-01	2.0E-01	8.7E-03	6.4E-02	9.9E-03	4.3E-02	9.7E-03	6.9E-03	1.1E+00
7	7.0E-04	8.3E-06	7.4E-03	3.9E-02	4.3E-02	2.3E-02	1.0E-03	7.7E-03	1.2E-03	5.1E-03	1.2E-03	8.3E-04	1.3E-01

GRASS ANALYSES CONCENTRATIONS (uCi/kg)
(T = +50 hours - 74 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	5.5E-02	6.9E-04	6.0E-01	3.5E+00	3.4E+00	1.0E+00	1.1E-02	7.7E-01	1.1E-01	5.1E-01	1.1E-01	5.3E-02	1.0E+01
2	1.3E+00	1.6E-02	1.4E+01	8.3E+01	8.2E+01	2.5E+01	2.6E-01	1.8E+01	2.7E+00	1.2E+01	2.6E+00	1.3E+00	2.4E+02
3	3.0E-01	3.8E-03	3.3E+00	1.9E+01	1.9E+01	5.7E+00	6.0E-02	4.2E+00	6.2E-01	2.8E+00	6.1E-01	2.9E-01	5.6E+01
4	1.4E+00	1.7E-02	1.5E+01	8.6E+01	8.6E+01	2.6E+01	2.7E-01	1.9E+01	2.8E+00	1.3E+01	2.8E+00	1.3E+00	2.5E+02
5	5.2E-01	6.5E-03	5.6E+00	3.3E+01	3.2E+01	9.7E+00	1.0E-01	7.2E+00	1.1E+00	4.8E+00	1.0E+00	5.0E-01	9.6E+01
6	4.1E-03	5.3E-05	4.6E-02	2.6E-01	2.6E-01	7.9E-02	8.3E-04	5.9E-02	8.6E-03	3.9E-02	8.4E-03	4.0E-03	7.6E-01
7	5.1E-04	6.6E-06	5.7E-03	3.3E-02	3.3E-02	9.7E-03	1.0E-04	7.3E-03	1.1E-03	4.9E-03	1.0E-03	5.0E-04	9.7E-02

FORAGE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +2 hours - 26 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	4.0E-02	3.0E-02	4.0E-01	1.7E+00	2.3E+00	3.0E+00	1.9E+00	3.0E-01	5.0E-02	2.0E-01	5.0E-02	6.0E-02	1.0E+01
2	9.6E-01	7.2E-01	9.6E+00	4.1E+01	5.5E+01	7.2E+01	4.6E+01	7.2E+00	1.2E+00	4.8E+00	1.2E+00	1.4E+00	2.4E+02
3	2.2E-01	1.7E-01	2.2E+00	9.4E+00	1.3E+01	1.7E+01	1.0E+01	1.7E+00	2.8E-01	1.1E+00	2.8E-01	3.3E-01	5.5E+01
4	1.0E+00	7.5E-01	1.0E+01	4.3E+01	5.8E+01	7.5E+01	4.8E+01	7.5E+00	1.3E+00	5.0E+00	1.3E+00	1.5E+00	2.5E+02
5	3.8E-01	2.9E-01	3.8E+00	1.6E+01	2.2E+01	2.9E+01	1.8E+01	2.9E+00	4.8E-01	1.9E+00	4.8E-01	5.7E-01	9.5E+01
6	3.0E-03	2.3E-03	3.0E-02	1.3E-01	1.8E-01	2.3E-01	1.5E-01	2.3E-02	3.8E-03	1.5E-02	3.8E-03	4.5E-03	7.6E-01
7	4.0E-04	3.0E-04	4.0E-03	1.7E-02	2.3E-02	3.0E-02	1.9E-02	3.0E-03	5.0E-04	2.0E-03	5.0E-04	6.0E-04	1.0E-01

FORAGE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +26 hours - 50 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	2.5E-02	2.9E-04	2.6E-01	1.3E+00	1.5E+00	8.1E-01	3.7E-02	2.7E-01	4.1E-02	1.8E-01	4.1E-02	2.9E-02	4.5E+00
2	6.2E-01	7.3E-03	6.5E+00	3.3E+01	3.7E+01	2.0E+01	9.2E-01	6.7E+00	1.0E+00	4.5E+00	1.0E+00	7.3E-01	1.1E+02
3	1.4E-01	1.6E-03	1.4E+00	7.4E+00	8.3E+00	4.5E+00	2.0E-01	1.5E+00	2.3E-01	1.0E+00	2.3E-01	1.6E-01	2.5E+01
4	6.3E-01	7.4E-03	6.6E+00	3.4E+01	3.8E+01	2.1E+01	9.4E-01	6.9E+00	1.1E+00	4.6E+00	1.0E+00	7.4E-01	1.1E+02
5	2.3E-01	2.7E-03	2.4E+00	1.3E+01	1.4E+01	7.7E+00	3.5E-01	2.5E+00	3.9E-01	1.7E+00	3.9E-01	2.7E-01	4.3E+01
6	2.1E-03	2.4E-05	2.2E-02	1.1E-01	1.3E-01	7.0E-02	3.1E-03	2.3E-02	3.5E-03	1.5E-02	3.4E-03	2.4E-03	3.8E-01
7	2.5E-04	2.9E-06	2.6E-03	1.4E-02	1.5E-02	8.0E-03	3.7E-04	2.7E-03	4.2E-04	1.8E-03	4.1E-04	2.9E-04	4.5E-02

FORAGE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +50 hours - 74 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	1.9E-02	2.4E-04	2.1E-01	1.2E+00	1.2E+00	3.6E-01	3.8E-03	2.7E-01	4.0E-02	1.8E-01	3.9E-02	1.9E-02	3.5E+00
2	4.6E-01	5.8E-03	5.0E+00	2.9E+01	2.9E+01	8.7E+00	9.2E-02	6.4E+00	9.5E-01	4.3E+00	9.3E-01	4.5E-01	8.5E+01
3	1.1E-01	1.3E-03	1.1E+00	6.7E+00	6.6E+00	2.0E+00	2.1E-02	1.5E+00	2.2E-01	9.8E-01	2.1E-01	1.0E-01	1.9E+01
4	4.8E-01	6.0E-03	5.2E+00	3.0E+01	3.0E+01	9.0E+00	9.5E-02	6.7E+00	9.9E-01	4.5E+00	9.7E-01	4.7E-01	8.9E+01
5	1.8E-01	2.3E-03	2.0E+00	1.1E+01	1.1E+01	3.4E+00	3.6E-02	2.5E+00	3.7E-01	1.7E+00	3.7E-01	1.8E-01	3.4E+01
6	1.5E-03	1.9E-05	1.6E-02	9.0E-02	9.0E-02	2.8E-02	2.9E-04	2.1E-02	3.0E-03	1.4E-02	3.0E-03	1.4E-03	2.7E-01
7	1.8E-04	2.3E-06	2.0E-03	1.2E-02	1.2E-02	3.4E-03	3.6E-05	2.6E-03	3.8E-04	1.7E-03	3.7E-04	1.8E-04	3.4E-02

LEAFY VEGETABLE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +2 hours - 26 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	5.0E-02	3.8E-02	5.0E-01	2.1E+00	2.9E+00	3.8E+00	2.4E+00	3.8E-01	6.3E-02	2.5E-01	6.3E-02	7.5E-02	1.3E+01
2	1.2E+00	9.0E-01	1.2E+01	5.1E+01	6.9E+01	9.0E+01	5.7E+01	9.0E+00	1.5E+00	6.0E+00	1.5E+00	1.8E+00	3.0E+02
3	2.8E-01	2.1E-01	2.8E+00	1.2E+01	1.6E+01	2.1E+01	1.3E+01	2.1E+00	3.4E-01	1.4E+00	3.4E-01	4.1E-01	6.9E+01
4	1.3E+00	9.4E-01	1.3E+01	5.3E+01	7.2E+01	9.4E+01	5.9E+01	9.4E+00	1.6E+00	6.3E+00	1.6E+00	1.9E+00	3.1E+02
5	4.8E-01	3.6E-01	4.8E+00	2.0E+01	2.7E+01	3.6E+01	2.3E+01	3.6E+00	5.9E-01	2.4E+00	5.9E-01	7.1E-01	1.2E+02
6	3.8E-03	2.8E-03	3.8E-02	1.6E-01	2.2E-01	2.8E-01	1.8E-01	2.8E-02	4.7E-03	1.9E-02	4.7E-03	5.6E-03	9.5E-01
7	5.0E-04	3.8E-04	5.0E-03	2.1E-02	2.9E-02	3.8E-02	2.4E-02	3.8E-03	6.3E-04	2.5E-03	6.3E-04	7.5E-04	1.3E-01

LEAFY VEGETABLE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +26 hours - 50 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	3.1E-02	3.6E-04	3.2E-01	1.7E+00	1.9E+00	1.0E+00	4.6E-02	3.4E-01	5.2E-02	2.2E-01	5.1E-02	3.6E-02	5.6E+00
2	7.7E-01	9.1E-03	8.1E+00	4.1E+01	4.6E+01	2.5E+01	1.1E+00	8.4E+00	1.3E+00	5.6E+00	1.3E+00	9.1E-01	1.4E+02
3	1.7E-01	2.0E-03	1.8E+00	9.2E+00	1.0E+01	5.6E+00	2.5E-01	1.9E+00	2.9E-01	1.2E+00	2.8E-01	2.0E-01	3.1E+01
4	7.9E-01	9.3E-03	8.3E+00	4.2E+01	4.7E+01	2.6E+01	1.2E+00	8.6E+00	1.3E+00	5.7E+00	1.3E+00	9.3E-01	1.4E+02
5	2.9E-01	3.4E-03	3.1E+00	1.6E+01	1.8E+01	9.6E+00	4.3E-01	3.2E+00	4.9E-01	2.1E+00	4.8E-01	3.4E-01	5.3E+01
6	2.6E-03	3.0E-05	2.7E-02	1.4E-01	1.6E-01	8.8E-02	3.8E-03	2.8E-02	4.3E-03	1.9E-02	4.3E-03	3.0E-03	4.7E-01
7	3.1E-04	3.6E-06	3.3E-03	1.7E-02	1.9E-02	1.0E-02	4.6E-04	3.4E-03	5.2E-04	2.3E-03	5.1E-04	3.6E-04	5.7E-02

LEAFY VEGETABLE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +50 hours - 74 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	2.4E-02	3.0E-04	2.6E-01	1.5E+00	1.5E+00	4.5E-01	4.8E-03	3.4E-01	5.0E-02	2.2E-01	4.8E-02	2.3E-02	4.4E+00
2	5.8E-01	7.2E-03	6.3E+00	3.6E+01	3.6E+01	1.1E+01	1.1E-01	8.0E+00	1.2E+00	5.4E+00	1.2E+00	5.6E-01	1.1E+02
3	1.3E-01	1.7E-03	1.4E+00	8.3E+00	8.3E+00	2.5E+00	2.6E-02	1.8E+00	2.7E-01	1.2E+00	2.7E-01	1.3E-01	2.4E+01
4	6.0E-01	7.5E-03	6.5E+00	3.8E+01	3.7E+01	1.1E+01	1.2E-01	8.4E+00	1.2E+00	5.6E+00	1.2E+00	5.8E-01	1.1E+02
5	2.3E-01	2.8E-03	2.5E+00	1.4E+01	1.4E+01	4.3E+00	4.5E-02	3.2E+00	4.7E-01	2.1E+00	4.6E-01	2.2E-01	4.2E+01
6	1.8E-03	2.3E-05	2.0E-02	1.1E-01	1.1E-01	3.4E-02	3.6E-04	2.6E-02	3.8E-03	1.7E-02	3.7E-03	1.8E-03	3.3E-01
7	2.3E-04	2.9E-06	2.5E-03	1.4E-02	1.4E-02	4.3E-03	4.5E-05	3.2E-03	4.7E-04	2.1E-03	4.6E-04	2.2E-04	4.2E-02

LOCAL PRODUCE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +2 hours - 26 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	2.0E-02	1.5E-02	2.0E-01	8.5E-01	1.2E+00	1.5E+00	9.5E-01	1.5E-01	2.5E-02	1.0E-01	2.5E-02	3.0E-02	5.0E+00
2	4.8E-01	3.6E-01	4.8E+00	2.0E+01	2.8E+01	3.6E+01	2.3E+01	3.6E+00	6.0E-01	2.4E+00	6.0E-01	7.2E-01	1.2E+02
3	1.1E-01	8.3E-02	1.1E+00	4.7E+00	6.3E+00	8.3E+00	5.2E+00	8.3E-01	1.4E-01	5.5E-01	1.4E-01	1.7E-01	2.8E+01
4	5.0E-01	3.8E-01	5.0E+00	2.1E+01	2.9E+01	3.8E+01	2.4E+01	3.8E+00	6.3E-01	2.5E+00	6.3E-01	7.5E-01	1.3E+02
5	1.9E-01	1.4E-01	1.9E+00	8.1E+00	1.1E+01	1.4E+01	9.0E+00	1.4E+00	2.4E-01	9.5E-01	2.4E-01	2.9E-01	4.8E+01
6	1.5E-03	1.1E-03	1.5E-02	6.5E-02	8.8E-02	1.1E-01	7.3E-02	1.1E-02	1.9E-03	7.5E-03	1.9E-03	2.3E-03	3.8E-01
7	2.0E-04	1.5E-04	2.0E-03	8.5E-03	1.2E-02	1.5E-02	9.5E-03	1.5E-03	2.5E-04	1.0E-03	2.5E-04	3.0E-04	5.0E-02

LOCAL PRODUCE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +26 hours - 50 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	1.2E-02	1.4E-04	1.3E-01	6.6E-01	7.4E-01	4.1E-01	1.8E-02	1.3E-01	2.1E-02	9.0E-02	2.0E-02	1.4E-02	2.2E+00
2	3.1E-01	3.6E-03	3.2E+00	1.7E+01	1.9E+01	1.0E+01	4.6E-01	3.4E+00	5.2E-01	2.2E+00	5.1E-01	3.6E-01	5.6E+01
3	6.9E-02	8.0E-04	7.2E-01	3.7E+00	4.1E+00	2.2E+00	1.0E-01	7.5E-01	1.2E-01	5.0E-01	1.1E-01	8.0E-02	1.2E+01
4	3.2E-01	3.7E-03	3.3E+00	1.7E+01	1.9E+01	1.0E+01	4.7E-01	3.4E+00	5.3E-01	2.3E+00	5.2E-01	3.7E-01	5.7E+01
5	1.2E-01	1.4E-03	1.2E+00	6.3E+00	7.0E+00	3.8E+00	1.7E-01	1.3E+00	2.0E-01	8.5E-01	1.9E-01	1.4E-01	2.1E+01
6	1.0E-03	1.2E-05	1.1E-02	5.5E-02	6.3E-02	3.5E-02	1.5E-03	1.1E-02	1.7E-03	7.5E-03	1.7E-03	1.2E-03	1.9E-01
7	1.2E-04	1.5E-06	1.3E-03	6.8E-03	7.5E-03	4.0E-03	1.8E-04	1.4E-03	2.1E-04	9.0E-04	2.1E-04	1.5E-04	2.3E-02

LOCAL PRODUCE ANALYSES CONCENTRATIONS (uCi/kg)
(T = +50 hours - 74 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	9.7E-03	1.2E-04	1.2E-01	6.1E-01	6.0E-01	1.8E-01	1.9E-03	1.3E-01	2.0E-02	8.9E-02	1.9E-02	9.3E-03	1.8E+00
2	2.3E-01	2.9E-03	2.5E+00	1.5E+01	1.4E+01	4.3E+00	4.6E-02	3.2E+00	4.8E-01	2.1E+00	4.6E-01	2.2E-01	4.2E+01
3	5.3E-02	6.6E-04	5.7E-01	3.3E+00	3.3E+00	9.9E-01	1.0E-02	7.4E-01	1.1E-01	4.9E-01	1.1E-01	5.1E-02	9.7E+00
4	2.4E-01	3.0E-03	2.6E+00	1.5E+01	1.5E+01	4.5E+00	4.8E-02	3.4E+00	5.0E-01	2.2E+00	4.8E-01	2.3E-01	4.4E+01
5	9.1E-02	1.1E-03	9.9E-01	5.7E+00	5.7E+00	1.7E+00	1.8E-02	1.3E+00	1.9E-01	8.4E-01	1.8E-01	8.8E-02	1.7E+01
6	7.3E-04	9.3E-06	8.0E-03	4.5E-02	4.5E-02	1.4E-02	1.5E-04	1.0E-02	1.5E-03	6.8E-03	1.5E-03	7.0E-04	1.3E-01
7	9.0E-05	1.2E-06	1.0E-03	5.8E-03	5.8E-03	1.7E-03	1.8E-05	1.3E-03	1.9E-04	8.5E-04	1.8E-04	8.8E-05	1.7E-02

MILK ANALYSES CONCENTRATIONS (uCi/l)
(T = +2 hours - 26 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

MDA = Minimum Detectable Activity for a five-minute count.
The MDA for milk sample analysis is 7.5E-03 uCi/l.

MILK ANALYSES CONCENTRATIONS (uCi/l)
(T = +26 hours - 50 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	<MDA	<MDA	<MDA	1.3E-01	<MDA	2.8E-02	<MDA	1.3E-02	<MDA	9.0E-03	<MDA	<MDA	1.8E-01
2	<MDA	<MDA	<MDA	3.3E+00	<MDA	7.1E-01	<MDA	3.4E-01	<MDA	2.2E-01	<MDA	<MDA	4.6E+00
3	<MDA	<MDA	<MDA	7.4E-01	<MDA	1.6E-01	<MDA	7.5E-02	<MDA	5.0E-02	<MDA	<MDA	1.0E+00
4	<MDA	<MDA	<MDA	3.4E+00	<MDA	7.2E-01	<MDA	3.4E-01	<MDA	2.3E-01	<MDA	<MDA	4.7E+00
5	<MDA	<MDA	<MDA	1.3E+00	<MDA	2.7E-01	<MDA	1.3E-01	<MDA	8.5E-02	<MDA	<MDA	1.7E+00
6	<MDA	<MDA	<MDA	1.1E-02	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	1.1E-02
7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

MDA = Minimum Detectable Activity for a five-minute count.
The MDA for milk sample analysis is 7.5E-03 uCi/l.

MILK ANALYSES CONCENTRATIONS (uCi/l)
(T = +50 hours - 74 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	<MDA	<MDA	<MDA	1.5E-01	<MDA	<MDA	<MDA	1.7E-02	<MDA	1.1E-02	<MDA	<MDA	1.7E-01
2	<MDA	<MDA	<MDA	3.5E+00	<MDA	1.7E-01	<MDA	4.0E-01	<MDA	2.7E-01	<MDA	<MDA	4.3E+00
3	<MDA	<MDA	<MDA	8.0E-01	<MDA	4.0E-02	<MDA	9.1E-02	<MDA	6.1E-02	<MDA	<MDA	9.9E-01
4	<MDA	<MDA	<MDA	3.6E+00	<MDA	1.6E-01	<MDA	4.2E-01	<MDA	2.8E-01	<MDA	<MDA	4.5E+00
5	<MDA	<MDA	<MDA	1.4E+00	<MDA	6.8E-02	<MDA	1.6E-01	<MDA	1.0E-01	<MDA	<MDA	1.7E+00
6	<MDA	<MDA	<MDA	1.1E-02	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	1.1E-02
7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

MDA = Minimum Detectable Activity for a five-minute count.
The MDA for milk sample analysis is 7.5E-03 uCi/l.

SURFACE WATER ANALYSES CONCENTRATIONS (uCi/l)
(T = +2 hours - 26 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA	8.2E-03	1.1E-02	1.4E-02	9.1E-03	<MDA	<MDA	<MDA	<MDA	<MDA	4.3E-02
3	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA	8.5E-03	1.2E-02	1.5E-02	9.5E-03	<MDA	<MDA	<MDA	<MDA	<MDA	4.5E-02
5	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

MDA = Minimum Detectable Activity for a five-minute count.
The MDA for surface water sample analysis is 7.5E-03 uCi/l.

SURFACE WATER ANALYSES CONCENTRATIONS (uCi/l)
(T = +26 hours - 50 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

MDA = Minimum Detectable Activity for a five-minute count.
The MDA for surface water sample analysis is 7.5E-03 uCi/l.

SURFACE WATER ANALYSES CONCENTRATIONS (uCi/l)
(T = +50 hour: . 4 hours)

Zone	Radionuclide												Total Concentration
	Mo-99	Tc-99m	Te-132	I-131	I-132	I-133	I-135	Cs-134	Cs-136	Cs-137	Ba-140	La-140	
1	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

MDA = Minimum Detectable Activity for a five-minute count.
The MDA for surface water sample analysis is 7.5E-03 uCi/l.

Summary of Results of Concentrations Versus Derived Response Levels to Determine if Preventive/Emergency PAGs were exceeded for the Vermont Yankee Ingestion Pathway Exercise

ZONE	EXPOSURE DURATION	LEAFY VEGETABLES	PRODUCE
1	Short Term	PREVENTIVE	EMERGENCY
1	Long Term	EMERGENCY	EMERGENCY
1	Short Term	EMERGENCY	EMERGENCY
2	Long Term	EMERGENCY	EMERGENCY
3	Short Term	EMERGENCY	EMERGENCY
3	Long Term	EMERGENCY	EMERGENCY
4	Short Term	EMERGENCY	EMERGENCY
4	Long Term	EMERGENCY	EMERGENCY
5	Short Term	EMERGENCY	EMERGENCY
5	Long Term	EMERGENCY	EMERGENCY
6	Short Term	NONE	PREVENTIVE
6	Long Term	NONE	PREVENTIVE
7	Short Term	NONE	NONE
7	Long Term	NONE	NONE

NOTES: 1) These results are based on the most restrictive population ingesting these foodstuffs.

2) These results are based on these foodstuffs being sampled and analyzed between T= +2 hours and T= +26 hours.

Short Term = Assumes an ingestion period equivalent to the shorter time interval of the radionuclide mean effective lifetime (includes weathering and radioactive decay) or 30 days.

Long Term = Assumes an ingestion period equivalent to the shorter time interval of the radionuclide mean effective lifetime (includes weathering and radioactive decay) or 365 days.

Emergency = Emergency Protective Action Guidelines Exceeded.

Preventive = Preventive Protective Action Guidelines Exceeded.

None = None of the Protective Action Guidelines Exceeded.

Summary of Results of Concentrations Versus Derived Response Levels to Determine if Preventive/Emergency PAGs were exceeded for the Vermont Yankee Ingestion Pathway Exercise (continued)

ZONE	MILK	DRINKING WATER	FORAGE
1	EMERGENCY	NONE	EMERGENCY
2	EMERGENCY	NONE	EMERGENCY
3	EMERGENCY	NONE	EMERGENCY
4	EMERGENCY	NONE	EMERGENCY
5	EMERGENCY	NONE	EMERGENCY
6	NONE	NONE	PREVENTIVE
7	NONE	NONE	NONE

NOTES:

1) These results are based on the most restrictive population ingesting these foodstuffs.

2) These results are based on milk being sampled and analyzed between T= +50 hours and T= +74 hours and drinking water and forage sampled and analyzed between T= +2 hours and T= +26 hours.

Emergency = Emergency Protective Action Guidelines Exceeded.

Preventive = Preventive Protective Action Guidelines Exceeded.

None = None of the Protective Action Guidelines Exceeded.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

7.0 METEOROLOGICAL DATA

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

7.1 GENERAL AREA NATIONAL WEATHER SERVICE FORECASTS

7.1 General Area National Weather Service Forecasts

THIS IS A DRILL

T = +12 hours* - Heavy rain will occur over the region due to a low pressure system moving through northern New England.

T = +24 hours* - A low pressure system is expected to be centered over Maine at 07:00 EST and move northeastward out to sea by day's end. Cloudy skies will prevail until evening when skies should clear. Temperatures will remain in the low to middle 50's. Moderate northerly winds should become west-northwesterly by day's end.

T = +48 hours - A high pressure system is expected to be centered over Pennsylvania at 07:00 EST. Skies should be partly cloudy. Temperatures will range from the middle to upper 60's. Light west-northwesterly winds.

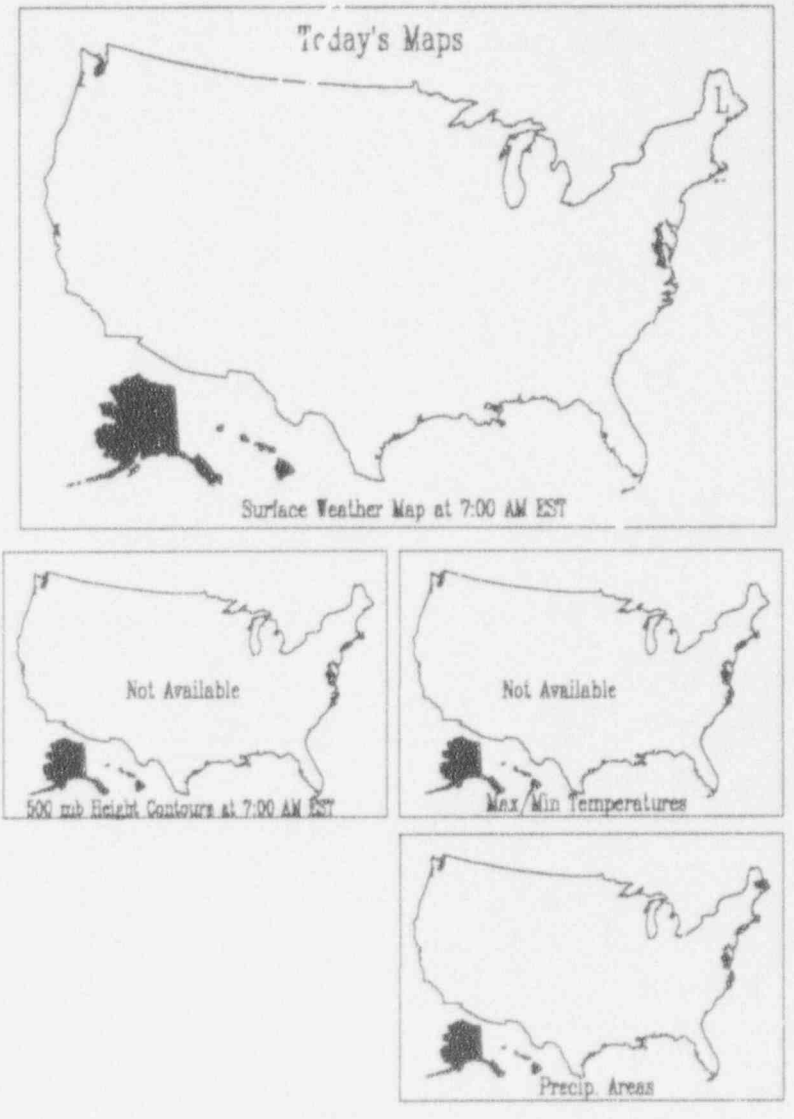
T = +72 hours - A high pressure system is expected to be centered over Massachusetts at 07:00 EST. Sunny skies with temperatures ranging from the middle to upper 70's. Winds will be light and variable. Clear skies this evening. Temperatures dropping to the middle 40's by morning. Winds light and variable. Mostly sunny tomorrow. Temperatures in the upper 60's. Light southeasterly winds.

* T = 0 hours corresponds to the termination of the release of radioactive material.

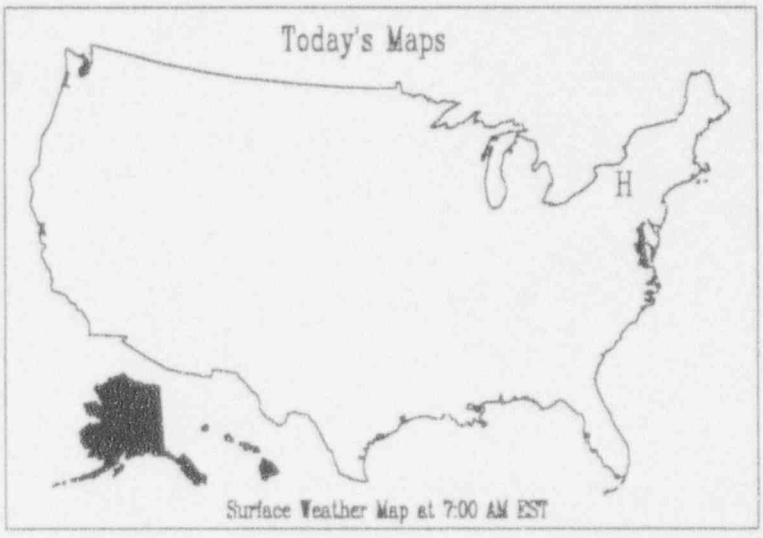
VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

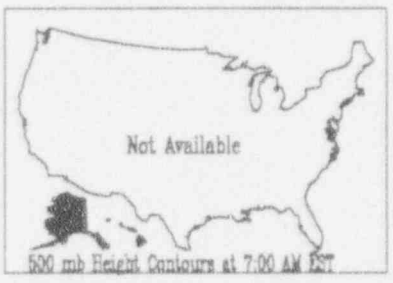
7.2 NATIONAL WEATHER SERVICE SURFACE MAPS

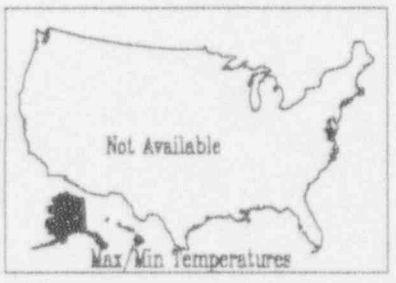
7.2 National Weather Service Map (T = +24 hours)

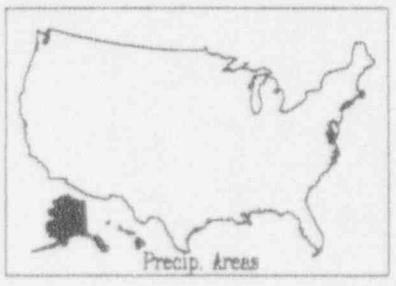


7.2 National Weather Service Map (T = +48 hours)

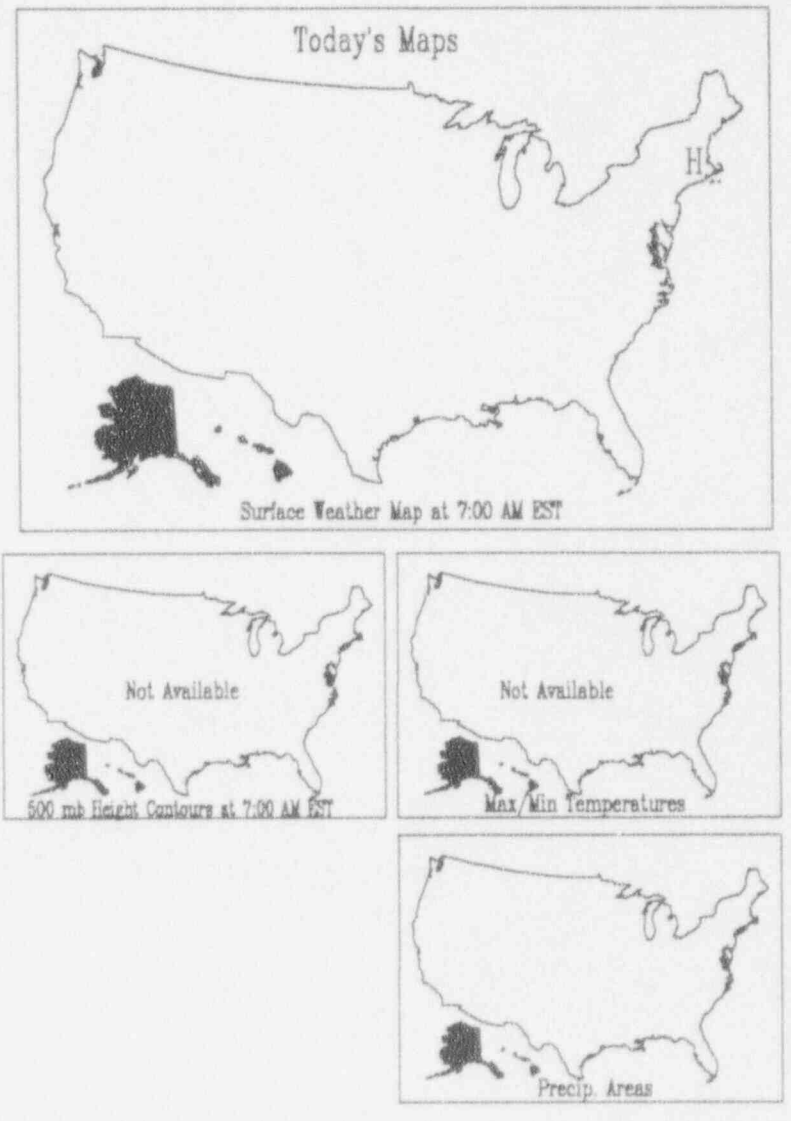








7.2 National Weather Service Map (T = +72 hours)



VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

8.0 COMMAND AND MESSAGE CARDS

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

8.1 COMMAND CARDS

(These cards provide supplemental information pertinent to anticipated player response actions. They direct specific actions and should not be issued unless players did not take this action prior to the specified time.)

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE COMMAND FORM

FROM:	EOC Controller	MESSAGE NO.:	EOC-C-1
TO:	Accident Assessment Players	CLOCK TIME:	Upon completion of plume exposure exercise
LOCATION:	State EOC	SCENARIO TIME:	After T=+2:00

Request a DOE flyover of the affected area and other federal assistance, as appropriate.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE COMMAND FORM

FROM: VT EOC Controller MESSAGE NO.: VTEOC-C-1

TO: VT Accident Assessment Players CLOCK TIME: 1315

LOCATION: VT EOC SCENARIO TIME: T=+26:15

Team should be directed to transport a sample to the Health Laboratory at this time.

The mechanism for transport should be identified to the FEMA Evaluator.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE COMMAND FORM

FROM: VT Laboratory Controller MESSAGE NO.: VTLAB-C-1

TO: VT Laboratory Supervisor CLOCK TIME: 1330

LOCATION: Vermont Department of Health Laboratory SCENARIO TIME: T=+26:30

Laboratory analysis results should be communicated to the VT State EOC at this time.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE COMMAND FORM

FROM:	EOC Controller	MESSAGE NO.:	EOC-C-2
TO:	Accident Assessment Players	CLOCK TIME:	1445
LOCATION:	State EOCs	SCENARIO TIME:	T=+27:45

Protective action decisions regarding the Relocation and Restricted Areas should be determined at this time.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE COMMAND FORM

FROM: EOC Controller MESSAGE NO.: EOC-C-3

TO: Emergency Management Staff Director CLOCK TIME: 1130

LOCATION: State EOCs SCENARIO TIME: T=+30:30

Protective action decisions regarding the Relocation and Restricted Areas should be discussed and implemented at this time.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

8.2 MESSAGE CARDS

(These cards provide supplemental information pertinent to anticipated player response actions. They provide clarification to the existing condition and should be issued at the specified times.)

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE MESSAGE FORM

FROM: EOC Controller MESSAGE NO.: EOC-M-1

TO: Accident Assessment Players CLOCK TIME: Upon completion of plume exposure exercise

LOCATION: State EOCs SCENARIO TIME: T=+2:00

Please discuss the relocation and environmental sampling approach and strategy based on the following information:

- Initial Conditions (Pages 5.2-1 and 5.2-2).
- Actual plume direction from the plume exposure exercise.
- Actual protective action decisions made by the states during plume exposure exercise.

Federal and other assistance (New England compact) may be assumed to be available.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE MESSAGE FORM

FROM: VT Radiological Monitoring Controller MESSAGE NO.: VT-M-1

TO: VT Radiological Monitoring Team Director CLOCK TIME: 0800

LOCATION: VT Muster Area SCENARIO TIME: T=+21:00

Please review the initial conditions provided (Page 5.2-3).

Also, the controller will provide a briefing on general player instructions.

Please introduce the team members to the FEMA evaluators.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE MESSAGE FORM

FROM: VT Laboratory Controller MESSAGE NO.: VTLAB-M-1

TO: VT Laboratory Players CLOCK TIME: 0830

LOCATION: Vermont Department of Health Laboratory SCENARIO TIME: T=+21:30

Please review the initial conditions provided (Page 5.2-3).

Also, the controller will provide a briefing on general player instructions.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE MESSAGE FORM

FROM: VT Laboratory Controller MESSAGE NO.: VTLAB-M-2

TO: VT Laboratory Players CLOCK TIME: 0900

LOCATION: Vermont Department of Health Laboratory SCENARIO TIME: T=+22:00

A sample box containing prepackaged (nonspiked) environmental samples is being provided for measurement and analysis.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

EXERCISE MESSAGE FORM

FROM: EOC Controller MESSAGE NO.: EOC-M-2

TO: Accident Assessment Players CLOCK TIME: 1300

LOCATION: EOCs SCENARIO TIME: T=+26:00

Please review the initial conditions provided (Pages 5.2-4 and 5.2-5).

Attached are the results of the field monitoring activities, DOE flyover data, and the ground deposition data (Page 6.2-1, Figure 6.2-2, and Page 6.2-7).

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
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EXERCISE MESSAGE FORM

FROM: EOC Controller MESSAGE NO.: EOC-M-3A

TO: Accident Assessment Players CLOCK TIME: 1300

LOCATION: State EOCs SCENARIO TIME: T=+26:00

At the time that a milk sample was collected at _____, the sampling team was informed by the farmer that he was away from his farm and consequently, did not shelter his dairy herd.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
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EXERCISE MESSAGE FORM

FROM: EOC Controller MESSAGE NO.: EOC-M-3B

TO: Accident Assessment Players CLOCK TIME: 1300

LOCATION: State EOCs SCENARIO TIME: T=+26:00

It was discovered by sampling teams sent to collect a milk sample from _____ that extensive repair work on the barn's roof was in progress at the time of the accident, rendering the barn useless as a shelter for the herd.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
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EXERCISE MESSAGE FORM

FROM:	EOC Controller	MESSAGE NO.:	EOC-M-3C
TO:	Accident Assessment Players	CLOCK TIME:	1300
LOCATION:	State EOCs	SCENARIO TIME:	T=+26:00

The sampling team sent to collect milk samples from _____ was informed that the main barn door on the southwest side of the barn swung open due to a faulty latch after dairy herd was sheltered and the herd was found grazing on a contaminated pasture the next day.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
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EXERCISE MESSAGE FORM

FROM:	EOC Controller	MESSAGE NO.:	EOC-M-4
TO:	EOC Players	CLOCK TIME:	1300
LOCATION:	EOCs	SCENARIO TIME:	T=+32:00

A 48-hour time jump has occurred. It is now T+80:00 since the release was terminated at Vermont Yankee.

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
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EXERCISE MESSAGE FORM

FROM: EOC Controller . MESSAGE NO.: EOC-M-5

TO: Accident Assessment Players CLOCK TIME: 1300

LOCATION: EOCs SCENARIO TIME: T=+80:00

A 48-hour time jump has occurred. It is now T=+80:00 since the release was terminated at Vermont Yankee.

Attached are the laboratory analysis results of ingestion pathway samples obtained by the environmental sampling teams (Section 6.4).

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

9.0 OBSERVATION/EVALUATION

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

9.1 CONTROLLER/OBSERVER ASSIGNMENTS

1993 INGESTION PATHWAY EXERCISE
CONTROLLER/OBSERVER ORGANIZATION

VERMONT YANKEE EXERCISE CONTROLLER
ED PORTER/ED SALOMON

VERMONT EOC	VT HEALTH DEPT	VT FIELD TEAMS	VT LAB BURLINGTON	NH EOC	MA EOC
CONTROLLER ZIKARAS	CONTROLLER BISSON	TM 1 CONTROLLER HARPER	CONTROLLER KEEFER	CONTROLLER MCDAVITT	CONTROLLER MCARDLE
OBSERVER JACKSON		TM 2 CONTROLLER PARILLO	GENERAL JACKSON		
		TM 3 CONTROLLER O'HARA			
		TM 4 CONTROLLER JACOBSON			

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

9.2 EVALUATION CRITERIA

9.2 EVALUATION CRITERIA

Each Controller and Observer has been assigned specific areas of response to evaluate. This section has been developed to assist the Controller and Observers in recording and documenting their findings and observations. The completed material will be an official record of the exercise observations.

Attachment A consists of forms to be used in maintaining an event chronology log.

Attachment B contains evaluation checklists. Each Controller and Observer should complete the checklist(s) that are applicable to their facility.

Attachment C contains an evaluation form which should be used to summarize major findings and observations. This form MUST BE completed by each Controller and Observer.

All three attachments should be completed and submitted to the Exercise Coordinator for documentation and record keeping.

ATTACHMENT A

Vermont Yankee Nuclear Power Station
Ingestion Pathway Exercise/Drill
Evaluator's Observations-Chronological Log

Time	Observation/Comment

Name: _____ Area Evaluated: _____

Date: _____

ATTACHMENT A
(Continued)

Time	Observation/Comment

Name: _____ Area Evaluated: _____

Date: _____

ATTACHMENT B

Vermont Yankee
Ingestion Pathway Exercise/Drill Evaluation Checklist

INSTRUCTIONS

The following evaluation checklists are provided to assist the Controller and Observers with their evaluation of the drill/exercise. The Controller and Observer should complete the checklist(s) for each applicable objective(s) at their assigned location(s).

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 24: POST-EMERGENCY SAMPLING

Demonstrate the use of equipment and procedures for the collection and transportation of samples from areas that received deposition from the airborne plume.

NUREG REF	POINTS OF REVIEW
I.8. J.11.	24.1. Identify the organization that demonstrated field sampling. _____
H.10. I.8. J.11.	24.2. Check the following sampling equipment and supplies that the field sampling team had with them or readily available to them. (Indicate YES, NO, N/A, or N/O in the space provided for each item.)

____ Scoops and/or shovels
____ Plastic collection bags with ties or fasteners
____ Metal or plastic containers
____ Identification labels
____ Writing materials
____ Flashlight
____ Area measuring template
____ Scissors, knives, or cutting equipment
____ Method to cleanse sampling equipment
____ Preservative (thiaole or formaldehyde), ice chest, or other refrigeration equipment to prevent spoilage of milk samples
____ Funnels
____ Low-range, beta-gamma survey instrument (e.g., CD V-700)
____ Beta-gamma survey instrument with a thin-window pancake-type detector
____ Micro-R survey meter
____ Other (Specify) _____

(a) Did the team check their equipment list prior to deployment to assure that none of it was missing?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 24: POST-EMERGENCY SAMPLING

NUREG REF POINTS OF REVIEW

(b) If equipment was missing, was replacement equipment obtained prior to deployment?

YES ___ NO ___ N/A ___ N/O ___

I.8.
J.11. 24.3. Indicate the type of samples collected. (Indicate YES, NO, N/A, or N/O in the space provided for each item. If demonstrated, indicate with D; if simulated, indicate with S.)

YES, NO, N/O, N/A	SAMPLE TYPE	D/S
_____	Stored food crops	_____
_____	Forage	_____
_____	Milk	_____
_____	Stored animal feed	_____
_____	Unharvested crops	_____
_____	Water	_____
_____	Snow	_____
_____	Vegetation	_____
_____	Soil	_____
_____	Other (Specify)_____	

H.10. 24.4. What type of survey instrument(s) was used to measure the radiation exposure rate at the sampling location and the exposure rate from the individual samples?

_____

_____

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 24: POST-EMERGENCY SAMPLING

NUREG REF	POINTS OF REVIEW
F.1.d. H.10.	24.5. Did the team perform a battery check on all equipment that requires batteries for operation? YES ___ NO ___ N/A ___ N/O ___ (a) Were spare batteries available? YES ___ NO ___ N/A ___ N/O ___
H.10.	24.6. Did the team check for proper operational response of each survey instrument with a radioactive check source, where appropriate, or perform an internal operational check of the survey instrument? YES ___ NO ___ N/A ___ N/O ___ (a) Were low-range survey instruments checked for proper response to normal background radiation? YES ___ NO ___ N/A ___ N/O ___ (b) If an instrument demonstrated improper operation, was backup equipment provided? YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 24: POST-EMERGENCY SAMPLING

NUREG REF	POINTS OF REVIEW
H.10.	24.7. Was each survey instrument labeled with the following information? (Indicate YES, NO, N/A, or N/O in the space provided for each item.)

_____ Date of most recent calibration or date that next calibration is due

_____ For instruments with check sources, the appropriate reading (or range of readings) for the check source

_____ Calibration curve or exposure rate correction factors

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 24: POST-EMERGENCY SAMPLING

NUREG REF POINTS OF REVIEW

(a) Record calibration date from survey instrument for each instrument used. Provide either most recent date calibrated or calibration due date.

INSTRUMENT	MOST RECENT DATE CALIBRATED	CALIBRATION DUE DATE

(b) Were the calibration dates, above, within 12 months of the exercise date?

YES ___ NO ___ N/A ___ N/O ___

I.8., J.10.a. 24.8. Did each team have a map(s) of the areas where samples were collected?

YES ___ NO ___ N/A ___ N/O ___

(a) If yes, were predetermined sampling locations identified?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 24: POST-EMERGENCY SAMPLING

NUREG REF	POINTS OF REVIEW
I.8. J.11	24.9. Did the sampling team demonstrate proper sample-taking procedures? YES ___ NO ___ N/A ___ N/O ___
I.8. J.11.	24.10. Were measures taken to avoid cross-contamination of samples? YES ___ NO ___ N/A ___ N/O ___
I.8. J.11	24.11. Was each sample bagged and labeled with time, date, location taken, identification of the individual who took the sample, radiation exposure rate reading at the sampling location, and exposure rate from the sample? YES ___ NO ___ N/A ___ N/O ___ (a) Did the labels, on samples taken **in support of relocation decisions**, also indicate the size of the area included in the sample? YES ___ NO ___ N/A ___ N/O ___
H.12. I.8. J.11.	24.12. At what time were **initial samples** delivered to a central point or to an appropriate laboratory for analyses? _____
N.1.a.	24.13. In the implementation of the activities associated with this objective, did the organization follow its plans and procedures? YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 24: POST-EMERGENCY SAMPLING

NUREG REF	POINTS OF REVIEW
H.10.,12. I.8. J.11., N.1.a	24.14. Specify whether or not the following demonstration criteria were successfully demonstrated during this exercise using YES, NO, N/A, or N/O.

_____ 1. Each team demonstrated necessary equipment and procedures to properly collect samples. (H.10., I.8., J.11; PORs 24.1-24.11)

_____ 2. Samples were promptly transported to a central point or to an appropriate laboratory for analyses. (H.12., I.8., J.11.; POR 24.12)

_____ 3. All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, unless deviations were provided for in the extent-of-play agreement. (N.1.a.; POR 24.13)

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 25: LABORATORY OPERATIONS

Demonstrate laboratory operations and procedures for measuring and analyzing samples.

NUREG REF	POINTS OF REVIEW
I.9. J.11. M.	25.1. What laboratory(ies) was used for analyses of the samples? _____ _____ (a) Was a mobile/field laboratory(ies) used? YES ___ NO ___ N/A ___ N/O ___
I.8.	25.2. Did the laboratory staff record the time of receipt and identity of all samples? YES ___ NO ___ N/A ___ N/O ___
I.9. J.11. M.	25.3. Indicate the time of receipt of the **initial sample** for analyses for each of the following sample types that were received. _____ Iodine cartridge _____ Air particulate filter _____ Animal feeds _____ Water _____ Grain _____ Forage _____ Food crops _____ Vegetable samples _____ Milk _____ Snow (melted) _____ Meat samples _____ Soil samples _____ Poultry _____ Other (Specify) _____
I.8.	25.4. Did the laboratory staff follow appropriate procedures for avoiding cross-contamination of samples? YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 25: LABORATORY OPERATIONS

NUREG REF POINTS OF REVIEW

(a) Did the laboratory staff follow appropriate procedures for avoiding contamination of the laboratory?

YES ___ NO ___ N/A ___ N/O ___

I.8. 25.5. Did the laboratory staff segregate and store samples that had measurable gamma exposure rates in a location that would avoid build-up of the background radiation level in the laboratory counting area?

YES ___ NO ___ N/A ___ N/O ___

J.11. 25.6. Were steps taken to assure preservation of milk samples?

YES ___ NO ___ N/A ___ N/O ___

I.8. 25.7. What quality assurance procedures were in place for accuracy and precision of analyses?

_____

_____

_____

_____

_____

_____

_____

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 25: LABORATORY OPERATIONS

NUREG REF	POINTS OF REVIEW
H.10. I.8.	25.8. Did the laboratory have the following analytical capabilities? (Check those available.) ____ Gamma spectrum ____ Lithium drifted germanium [Ge(Li)] ____ Liquid scintillation ____ Strontium 90 ____ Other (Specify) _____
I.8.	25.9. Were fixed (reproducible) geometry(ies) used for counting of samples? YES ___ NO ___ N/A ___ N/O ___
I.8. J.11. M.	25.10. Were sample and background counting times adjusted to be commensurate with the required minimum detectable levels for emergency response decisions? YES ___ NO ___ N/A ___ N/O ___
I.8. J.11. M.	25.11. Were measurement(s) of the radioactivity in samples made? YES ___ NO ___ N/A ___ N/O ___ (a) Were these measurements reported in units of radioactivity per unit of measure? YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 25: LABORATORY OPERATIONS

NUREG REF	POINTS OF REVIEW
I.8. J.11. M.	25.12. Indicate the time that the laboratory staff provided the results of its **initial analyses** to the dose assessment group for the following sample types analyzed:

_____	Iodine cartridge	_____	Air particulate filter
_____	Animal feeds	_____	Water
_____	Grain	_____	Forage
_____	Food crops	_____	Vegetable samples
_____	Milk	_____	Snow (melted)
_____	Meat samples	_____	Soil samples
_____	Poultry	_____	Other (Specify) _____

.a. 25.13. In the implementation of the activities associated with this objective, did the organization follow its plans and procedures?

YES ___ NO ___ N/A ___ N/O ___

H.10.
I.8.,9.
J.11.
M.
N.1.a.

25.14. Specify whether or not the following demonstration criteria were successfully demonstrated during this exercise using YES, NO, N/A, or N/O.

___ 1. The laboratory staff had the capability to process samples, as required. (I.8.,9.,J.11.,M.; PORs 25.1-25.6)

___ 2. The laboratory was equipped with laboratory-grade analytical instruments suitable for determining radioisotopes present and levels of radioactivity in samples. Trained personnel used this equipment to perform procedures for assessment. (H.10.,I.8.,J.11.,M.; PORs 25.7-25.12)

___ 3. All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, unless deviations were provided for in the extent-of-play agreement. (N.1.a.; POR 25.13)

EVALUATOR _____ TEAM LEADER _____ ___ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 26: INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING

Demonstrate the capability to project dose to the public for the ingestion exposure pathway and to recommend protective actions.

NUREG REF	POINTS OF REVIEW
I.8.	26.1. How was the geographical area of concern initially identified?
	_____
	_____
	_____
	(a) Was the contaminated area later verified by actual field measurements of the radionuclide concentration and gamma radiation levels?
	YES ___ NO ___ N/A ___ N/O ___
J.11.	26.2. When were the initial results of laboratory analyses of food, milk, or water samples provided?
	DATE_____ TIME_____
I.10. J.11.	26.3. Were dose projections made for the ingestion exposure pathway?
	YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 26: INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING

NUREG REF POINTS OF REVIEW

(a) Which of the following were considered in dose projection? (Check the items considered.)

____ Dietary intake factors
____ Radionuclide build-up in food
____ Radioactive decay
____ Other (Specify) _____

I.10. 26.4 Were derived response levels corresponding to the protective action guides (PAG) used for decision criteria?

YES ___ NO ___ N/A ___ N/O ___

J.11. 26.5. What PAGs or derived response levels were used for decisions on protective actions? Record the values, with units, for any of the following protective actions for which PAGs or derived response levels were used.

_____ Place milk-producing animals on stored feed and protected water
_____ Place animals in a sheltered area
_____ Wash, scrub, shell, or peel fresh fruit/vegetables
_____ Store milk for processing into milk by-products
_____ Monitor poultry and egg production
_____ Permit grains to grow to maturity
_____ Quarantine (Isolate agricultural products)
_____ Embargo (Prevent the movement of products)
_____ Destroy food products
_____ Other (Specify) _____

J.11. 26.6. Were any of the PAGs exceeded?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 26: INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING

NUREG REF POINTS OF REVIEW

(a) If yes, which food pathway(s) (e.g. milk, and fresh fruit and vegetables) were exceeded?

_____

_____

J.11. 26.7. If the PAGs or derived response levels were exceeded, which of the following protective actions were recommended to the response organization? (Check those selected.)

ACTION SELECTED

____ Place milk-producing animals on stored feed and protected water
____ Place animals in a sheltered area
____ Wash, scrub, shell, or peel fresh fruit/vegetables
____ Store milk for processing into milk by-products
____ Monitor poultry and egg production
____ Permit grains to grow to maturity
____ Quarantine (Isolate agricultural products)
____ Embargo (Prevent the movement of products)
____ Destroy food products
____ Other (Specify) _____

J.11. 26.8. On the basis of early plume projection information, was a precautionary decision made to put milk-producing animals on stored feed and protected water?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 26: INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING

NUREG REF POINTS OF REVIEW

(a) If yes, when was the decision made?

_____

(b) Was this decision made before the receipt of radiological monitoring data from the field?

YES ___ NO ___ N/A ___ N/O ___

J.11. 26.9. Were all ingestion exposure pathway protective action decisions (PAD), except for the precautionary decision to put milk-producing animals on stored feed and protected water, based on verified laboratory measurements of food, milk, and water samples?

YES ___ NO ___ N/A ___ N/O ___

(a) List and describe any ingestion exposure pathway PADs not based on verified measurements.

_____

_____

_____

_____

_____

_____

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 26: INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING

NUREG REF	POINTS OF REVIEW
J.11.	26.10. Were ingestion-related PADs made in consultation with other organizations?

YES ___ NO ___ N/A ___ N/O ___

(a) If yes, identify those organizations and their contribution to the decision making process.

ORGANIZATION	CONTRIBUTION
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

N.1.a. 26.11. In the implementation of the activities associated with this objective, did the organization follow its plans and procedures?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 26: INGESTION EXPOSURE PATHWAY - DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING

NUREG REF	POINTS OF REVIEW
I.8.,10. J.11. N.1.a.	26.12. Specify whether or not the following demonstration criteria were successfully demonstrated during this exercise using YES, NO, N/A, or N/O.

_____ 1. Projected dose was calculated for the ingestion exposure pathway. (I.8.,J.10.,11.; PORs 26.1-26.4)

_____ 2. Protective action decisions were made for the ingestion exposure pathway. (J.11.; PORs 26.5-26.10)

_____ 3. All of the activities described in the demonstration criteria for this objective were carried out in accordance with the plan, unless deviations were provided for in the extent-of-play agreement. (N.1.a.; POR 26.11)

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 27: INGESTION EXPOSURE PATHWAY - PROTECTIVE ACTION IMPLEMENTATION

Demonstrate the capability to implement protective actions for the ingestion exposure pathway.

NUREG REF

POINTS OF REVIEW

J.9.,11.

27.1. Indicate which of the following resources were available at the emergency operations center for use in the implementation of protection actions. (Please indicate YES, NO, N/A, or N/O in the space provided for each item.)

	Maps	Location Listings	Contact Persons	Telephone Numbers	Other (Specify)
Dairy Farms					
Meat and poultry producers					
Fisheries					
Fruit growers					
Crops					
Food processing plants					
Water intake points					
Other (Specify)					

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 27: INGESTION EXPOSURE PATHWAY - PROTECTIVE ACTION IMPLEMENTATION

NUREG REF	POINTS OF REVIEW
E.5.,7.	27.2. Did responsible organizations have appropriate pre-printed materials on ingestion exposure pathway protective actions available for rapid reproduction and distribution to individuals and organizations within the ingestion exposure pathway emergency planning zone? YES ___ NO ___ N/A ___ N/O ___
J.9.,11.	27.3. Which of the following protective actions were implemented? (Please indicate YES, NO, N/A, or N/O in the space provided for each item.) PROTECTIVE ACTIONS ___ Place milk-producing animals on stored feed and protected water ___ Place animals in a sheltered area ___ Wash, scrub, shell, or peel fresh fruit/vegetables ___ Store milk for processing into milk by-products ___ Monitor poultry and egg production ___ Permit grains to grow to maturity ___ Quarantine (Isolate agricultural products) ___ Embargo (Prevent the movement of products) ___ Destroy food products ___ Other (Specify) _____

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 27: INGESTION EXPOSURE PATHWAY - PROTECTIVE ACTION IMPLEMENTATION

NUREG REF	POINTS OF REVIEW
J.9.,11.	27.4. What individuals and organizations were contacted for implementation of the protective actions and at what times?

INDIVIDUAL/ORGANIZATION	TIME
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

E.5.,7.
J.9.,11. 27.5. Identify those protective actions that were disseminated to the public via the Emergency Broadcast System or other means.

PROTECTIVE ACTIONS

____ Place milk-producing animals on stored feed and protected water
____ Place animals in a sheltered area
____ Wash, scrub, shell, or peel fresh fruit/vegetables
____ Store milk for processing into milk by-products
____ Monitor poultry and egg production
____ Permit grains to grow to maturity
____ Quarantine (Isolate agricultural products)
____ Embargo (Prevent the movement of products)
____ Destroy food products
____ Other (Specify) _____

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 27: INGESTION EXPOSURE PATHWAY - PROTECTIVE ACTION IMPLEMENTATION

NUREG REF	POINTS OF REVIEW
N.1.a.	27.6. In the implementation of the activities associated with this objective, did the organization follow its plans and procedures? YES ___ NO ___ N/A ___ N/O ___
E.5.,7. J.9.,11. N.1.a.	27.7. Specify whether or not the following demonstration criteria were successfully demonstrated during this exercise using YES, NO, N/A, or N/O.

_____ 1. The organization had available adequate information regarding water and food supplies and milk and agricultural production within the ingestion exposure pathway emergency planning zone for implementation of protective actions. (J.9.,11.; POR 27.1)

_____ 2. Appropriate pre-printed information and instructions on ingestion exposure pathway protective actions were available for rapid reproduction and distribution to pre-determined individuals and businesses. (E.5.,7.; POR 27.2.)

_____ 3. Appropriate measures and strategies were developed for implementing protective action decisions for contaminated water and food products and milk and agricultural production. (E.5.,7., J.9.,11.; PORs 27.3.-27.5.)

_____ 4. All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, unless deviations were provided for in the extent-of-play agreement. (N.1.a.; POR 27.6.)

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 28: RELOCATION, RE-ENTRY, AND RETURN - DECISION MAKING

Demonstrate the capability to develop decisions on relocation, re-entry, and return.

NUREG REF	POINTS OF REVIEW
	RELOCATION
I.10. M.1.	28.1. Was the area from which individuals should be relocated determined on the basis of laboratory measurements of the mix of radionuclides in deposited materials and the calculated exposure rates corresponding to the relocation protective action guide (PAG)?

YES ___ NO ___ N/A ___ N/O ___

NOTE: If no, skip to POR 28.2.

(a) Were results of laboratory analyses of isotopic concentrations in surface samples available?

YES ___ NO ___ N/A ___ N/O ___

(b) From how many locations were sample data available?

_____

(c) Were gamma exposure rates [milliroentgens per hour (mR/h)] and first year doses calculated for the samples that were taken?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 28: RELOCATION, RE-ENTRY, AND RETURN - DECISION MAKING

NUREG REF POINTS OF REVIEW

(d) Was a factor developed for converting gamma-exposure-rate measurements, taken at waist level, directly into dose [Roentgen equivalent man (rem)] that an individual would receive during the first year of exposure?

YES ___ NO ___ N/A ___ N/O ___

(e) If yes, record the factor.

_____ Factor

(f) Was an exposure rate in mR/h derived that would correspond to the relocation protective action guides (PAG) dose during the first year of exposure?

YES ___ NO ___ N/A ___ N/O ___

(g) If yes, record the derived level.

_____ Derived level in mR/h.

I.10.
M.1. 28.2. Was the area from which individuals should be relocated based on a predetermined, conservative, exposure rate to assure that the relocation PAG would not be exceeded?

YES ___ NO ___ N/A ___ N/O ___

(a) If yes, what was the predetermined exposure rate?

_____

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 28: RELOCATION, RE-ENTRY, AND RETURN - DECISION MAKING

NUREG REF	POINTS OF REVIEW
I.10.	28.3. Were areas found where the gamma exposure rate exceeded the calculated exposure rate (POR 28.1) or the predetermined exposure rate (POR 28.2)?
	YES ___ NO ___ N/A ___ N/O ___
	(a) If yes, were areas where the measured exposure rate exceeded the calculated or predetermined exposure rate identified on a map?
	YES ___ NO ___ N/A ___ N/O ___
M.1.	28.4. Were arrangements for provision of medical and social assistance for relocated individuals considered?
	YES ___ NO ___ N/A ___ N/O ___
	RE-ENTRY
I.10. M.1.	28.5. Were decisions made for controlled **re-entry** of emergency workers into the restricted zone?
	YES ___ NO ___ N/A ___ N/O ___
	(a) Were these decisions based on established exposure limits?
	YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 28: RELOCATION, RE-ENTRY, AND RETURN - DECISION MAKING

NUREG REF	POINTS OF REVIEW
	(b) What were the exposure limits, including the time period over which the dose would accumulate?
	_____
	_____
I.10. M.1.	28.6. Were decisions made for controlled re-entry of members of the general public into the restricted zone?
	YES ___ NO ___ N/A ___ N/O ___
	(a) Were these decisions based on established exposure limits?
	YES ___ NO ___ N/A ___ N/O ___
	(b) What were the exposure limits, including the time period over which the dose would accumulate?
	_____
	_____
I.10. M.1	28.7. Were decisions made on the provision of dosimetry for re-entry?
	YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 28: RELOCATION, RE-ENTRY, AND RETURN - DECISION MAKING

NUREG REF	POINTS OF REVIEW
	RETURN
I.10. M.1.	28.8. Were decisions made for the return of evacuated or relocated individuals?
	YES ___ NO ___ N/A ___ N/O ___
	(a) Were these decisions based on the relocation PAG?
	YES ___ NO ___ N/A ___ N/O ___
	(b) Were these decisions based on a gradual return to the boundary of the restricted zone?
	YES ___ NO ___ N/A ___ N/O ___
M.1.	28.9. Were plans developed for the restoration of important public services for individuals outside the restricted zone?
	YES ___ NO ___ N/A ___ N/O ___
A.1.b. M.1.	28.10. Were decisions coordinated with other organizations?
	YES ___ NO ___ N/A ___ N/O ___
N.1.a.	28.11. In the implementation of the activities associated with this objective, did the organization follow its plans and procedures?
	YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 28: RELOCATION, RE-ENTRY, AND RETURN - DECISION MAKING

NUREG REF	POINTS OF REVIEW
A.1.b. I.10. M.1. N.1.a.	28.12. Specify whether or not the following demonstration criteria were successfully demonstrated during this exercise using YES, NO, N/A, or N/O.

_____ 1. Areas requiring relocation of the public were identified by comparing simulated measurements to decision criteria. (I.10., M.1.; PORs 28.1-28.3)

_____ 2. Decision criteria and strategy were followed in decisions to allow re-entry into controlled areas. (I.10., M.1.; PORs 28.5-28.7)

_____ 3. Return recommendations were developed. (I.10., M.1.; POR 28.8)

_____ 4. Decisions were made regarding assistance to individuals who were affected by the emergency. (M.1.; PORs 28.4, 28.9)

_____ 5. Decisions were coordinated, as appropriate, with other organizations. (A.1.b., M.1.; POR 28.10)

_____ 6. All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, unless deviations were provided for in the extent-of-play agreement. (N.1.a.; POR 28.11)

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 29: RELOCATION, RE-ENTRY, AND RETURN - IMPLEMENTATION

Demonstrate the capability to implement relocation, re-entry, and return.

NUREG REF	POINTS OF REVIEW
	RELOCATION
M.1.,3.	29.1. Were decisions on relocation implemented?

YES ___ NO ___ N/A ___ N/O ___

(a) Were affected organizations notified of relocation decisions?

YES ___ NO ___ N/A ___ N/O ___

(b) Were public instructions on relocation developed and available for issuance?

YES ___ NO ___ N/A ___ N/O ___

M.1.,3. 29.2 Were procedures demonstrated for the establishment of a restricted zone on the basis of the relocation protective action guide (PAG)?

YES ___ NO ___ N/A ___ N/O ___

(a) Was transportation assistance available for transportation-dependent individuals relocated from the restricted zone?

YES ___ NO ___ N/A ___ N/O ___

(b) Were evacuated individuals, who were not allowed to return to the restricted zone, advised of their change in status from evacuated to relocated?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 29: RELOCATION, RE-ENTRY AND RETURN - IMPLEMENTATION

NUREG REF — POINTS OF REVIEW

RE-ENTRY

M.1.,3. 29.3. Were policies implemented on **re-entry** into the restricted zone for emergency workers and specific groups within the general public?

YES ___ NO ___ N/A ___ N/O ___

(a) Was the control of access and egress of vehicles and individuals established at or near the boundary of the restricted zone?

YES ___ NO ___ N/A ___ N/O ___

RETURN

M.1.,3. 29.4. Were decisions on **return** implemented?

YES ___ NO ___ N/A ___ N/O ___

(a) Were procedures demonstrated for allowing evacuees to return to areas not contaminated by the plume soon after the boundaries of the restricted zone were confirmed?

YES ___ NO ___ N/A ___ N/O ___

(b) Were procedures demonstrated for permitting a gradual return of evacuees to low-level contaminated areas?

YES ___ NO ___ N/A ___ N/O ___

EVALUATOR _____ TEAM LEADER _____ DATE _____

SITE _____ ASSIGNMENT _____ PREVIOUS ARCA? Y N

OBJECTIVE 29: RELOCATION, RE-ENTRY, AND RETURN - IMPLEMENTATION

NUREG REF	POINTS OF REVIEW
M.1.,3.	29.5 Was coordination with other organizations completed regarding relocation, re-entry, and return? YES ___ NO ___ N/A ___ N/O ___
N.1.a.	29.6. In the implementation of the activities associated with this objective, did the organization follow its plans and procedures? YES ___ NO ___ N/A ___ N/O ___
M.1.,3. N.1.a.	29.7. Specify whether or not the following demonstration criteria were successfully demonstrated during this exercise using YES, NO, N/A, or N/O. _____ 1. Decisions regarding relocation of populations were implemented. (M.1.,3.; POR 29.1.-29.2.) _____ 2. Decisions regarding controlled re-entry of emergency workers and members of the public were implemented. (M.1.,3.; POR 29.3) _____ 3. Decisions regarding return of evacuated population were implemented. (M.1.,3.; POR 29.4) _____ 4. Decisions regarding relocation, re-entry, and return were coordinated with appropriate organizations. (M.1.,3.; POR 29.5) _____ 5. All activities described in the demonstration criteria for this objective were carried out in accordance with the plan, unless deviations were provided for in the extent-of-play agreement. (N.1.a.; POR 29.6)

ATTACHMENT C

Ingestion Pathway Exercise/Drill
Controller/Observer's Evaluation Form

Name: _____ Exercise/Drill Date: _____

Exercise/Drill Title: _____

Location: _____

Time Started: _____ Time Ended: _____

Observed: (Fill out or attach attendance sheet)	Player	Function
	_____	_____
	_____	_____
	_____	_____

Overall Performance and Observations: (include the proper and effective use of procedures, equipment and personnel): _____

Recognized Weaknesses and Deficiencies: _____

Comments and Recommendations (Specific): _____

NOTE:

Use additional pages as required.

Signature: _____ Title: _____

ATTACHMENT C
(Continued)

Continued on Additional Pages _____Yes _____No

Signature: _____ Title: _____

Date: _____

VERMONT YANKEE NUCLEAR POWER STATION
INGESTION PATHWAY EXERCISE
1993

10.0 REFERENCES

10.0 REFERENCES

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