FEB 12 1986

Docket No. 50-271

Vermont Yankee Nuclear Power Corporation
ATTN: Mr. Warren P. Murphy
Vice President and Manager
RD 5, Box 169
Ferry Road
Brattleboro, Vermont 05301

Gentlemen:

Subject: FEMA Report on the Vermont Yankee April 17, 1985 Emergency Exercise and the June 6, 1985 Remedial Exercise

This letter transmits the Federal Emergency Management Agency report of the Vermont Yankee April 17, 1985 emergency exercise, and the subsequent remedial exercise of June 6, 1985 which was conducted to resolve Category A deficiencies identified during the April exercise.

FEMA's report identifies three Category A deficiencies observed during the April 17, 1985 exercise involving (1) slow transfer of accident assessment information between New Hampshire DPH and the New Hampshire state EOC, (2) failure to follow communication procedures between the states and the utility, and (3) dissemination of misleading/inaccurate public information. All three of these deficiencies were found to be remedied during the June 6, 1985 remedial exercise.

If you have any questions concerning this matter please contact me at (215) 337-5208.

Sincerely,

Original Signed By:
Terry L. Harpster, Chief
Emergency Preparedness Section
Division of Radiation Safety
and Safeguards

Attachments: As Stated

cc w/encl:
Mr. R. W. Capstick, Licensing Engineer
Mr. W. F. Conway, President and Chief Executive Officer
Mr. J. P. Pelletier, Plant Manager
Mr. Donald Hunter, Vice President
Mr. Cort Richardson, Vermont Public Interest Research Group, Inc.
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
State of New Hampshire
State of Vermont
E. Thomas, FEMA RI

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bcc w/encl:
Region I Docket Room (with concurrences)
DRP Section Chief
M. McBride, RI, Pilgrim
H. Eichenholz, SRI, Yankee
V. Rooney, LPM, NRR

RI:DRSS
Lazarus
2/11/86

RI:DRSS
Harpster
2/12/86

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Federal Emergency Management Agency

Washington, D.C. 20472

JAN 23 1986

MEMORANDUM FOR: Edward L. Jordan
Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission

FROM: Richard W. Krimm
Assistant Associate Director
Office of Natural and Technological
Hazards Programs

SUBJECT: Exercise Report of the April 17, 1985, Exercise of the Offsite Radiological Emergency Preparedness Plans for the Vermont Yankee Nuclear Power Plant and a Report on the June 6, 1985, Remedial Exercise

Attached is a copy of the Exercise Report of the April 17, 1985, Exercise of the offsite radiological emergency preparedness plans for the Vermont Yankee Nuclear Power Plant, Vernon, Vermont. This was a joint full participation exercise for the States of Vermont, Massachusetts and New Hampshire and the localities within the plume exposure emergency planning zone (EPZ). The report dated August 19, 1985, was prepared by Region I of the Federal Emergency Management Agency (FEMA). Also included is a report on the June 6, 1985, remedial exercise which was prepared by FEMA Region I and transmitted to this office on August 15, 1985.

There were three Category A deficiencies observed at the April exercise by the Region.

(1) The Region cited the State of New Hampshire for a Category A deficiency because the exchange of information among the Department of Public Health (DPH) accident assessment liaison staff at the utility's emergency operating facility (EOF), and between representatives of DPH management and civil defense operations management at the State emergency operating center (EOC), did not result in rapid enough communication of accident assessment data from the plant and the field for the Governor to make appropriate protective action decisions.

(2) The Region also cited the utility's EOF for a Category A deficiency for failure to follow communication procedures between the States and the utility as given in their respective plans for the General Emergency classification. This failure to follow planned procedures caused serious delays in official notification of state and local governments.

(3) The utility was also cited for a Category A deficiency for disseminating misleading and inaccurate public information, including protective action recommendations that could have conflicted with those recommended by State authorities. In a real incident, this would have confused the public.

Federal Emergency Management Agency

Region I J.W. McCormack Post Office and Court House
Boston, Massachusetts 02109

August 15, 1985

MEMORANDUM FOR: Samuel W. Speck
Associate Director
State and Local Programs and
Support Directorate

FROM: Edward A. Thomas
Division Chief
Natural and Technological Hazards

SUBJECT: Report on the Remedial Exercise for the Vermont Yankee Nuclear Power Station, June 6, 1985

Attached is the above referenced report for your information.

We conclude that the remedial exercise success fully demonstrated correction of the "Category A" deficiencies noted in the exercise.

If there are any questions on this matter, please call Rebecca Thomson at FTS 223-1197.

Enclosure

While FEMA does not routinely cite the utility for deficiencies, other than to note such a fault to the U. S. Nuclear Regulatory Commission, these deficiencies in offsite preparedness were significant enough to require prompt corrective actions on the part of the utility. Also the licensee was expected to cooperate in the early correction of these deficiencies.

As described in the attached report on the June 6, 1985, remedial exercise, the three Category A deficiencies were remedied as follows:

(1) The two-hour remedial drill at the New Hampshire EOC successfully tested a new high speed telefax which rapidly transmitted preformatted hard copy data from the New Hampshire DPH liaison staff at the EOF to the State EOC. Such transmissions were rapidly distributed to the State EOC staff through the immediate reproduction of materials. The hard copy was supported by rapid delivery of messages by telephone, especially changes in the emergency classification levels, so that the appropriate decisions could be promptly made among the DPH staff and between the DPH management, the Civil Defense decision makers and the Governor's office.

(2) The drill remedied the communication deficiency at the EOF because the communication procedures between the utility and the States were followed for the General Emergency classification as given in their respective plans. Also, with the support of the Nuclear Alert System (NAS) and the high speed facsimile machines, detailed data was transmitted rapidly and accurately.

(3) Finally the drill remedied the dissemination of misleading and inaccurate information to the public by the utility. There was a dramatic improvement by the utility through the media center in the clarity, accuracy, timeliness and frequency of news releases. In addition the utility appropriately deferred to the States the responsibility of issuing protective action recommendations to the public. Further, the NAS and the high speed facsimile machines were a major support in the improvement noted in the dissemination of information by the utility.

There were other inadequacies identified requiring corrective actions; however, they did not detract from the overall demonstrated cabability to protect the health and safety of the public. The States have received a draft copy of the exercise report and will be preparing schedules of corrective actions. When they are received and analyzed, we will send you copies.

If you have any questions, please contact Mr. Robert S. Wilkerson, Chief, Technological Hazards Division, at 646-2861.

Attachments
As Stated

REPORT ON THE REMEDIAL EXERCISE

FOR THE

VERMONT YANKEE NUCLEAR POWER STATION

JUNE 6, 1985

FEDERAL EMERGENCY MANAGEMENT AGENCY

REGION I

John W. McCormack Post Office and Courthouse Building

Boston, Massachusetts 02109

193pp

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SUMMARY

On June 6, 1985 a remedial exercise was held to correct the three "Category A" deficiencies identified in the draft report (and listed below) for the April 17 Vermont Yankee Exercise. A two hour drill was held, involving the following locations: the utility's EOF, the Media Center, the New Hampshire State EOC, and the communications rooms of the Vermont and Massachusetts State EOCs. Tested at this remedial exercise were: consistent means of notifying the state decision makers of all changes in emergency classification levels from the EOF, the ability of the utility's Media Center to develop timely and accurate news releases and properly coordinate them in advance with the states, and the ability of the New Hampshire accident assessment and decision maker staffs to communicate internally, in a timely manner, so as to make appropriate protective action recommendations and decisions based on current plant and field conditions. The remedial drill corrected the "Category A" deficiencies observed at the April 17, 1985 exercise.

I. INTRODUCTION

A. "Category A" Deficiencies of April 17, 1985 Exercise

The three "Category A" deficiencies observed at the April 17, 1985 exercise were as follows:

NEW HAMPSHIRE

(1) Description: Exchange of information among the Department of Public Health accident assessment staff and between representatives of DPH management and civil defense operations management, did not result in rapid enough communication of accident assessment data from the plant and the field for the Governor to make appropriate protective action decisions. [FEMA-REP-1, Rev. 1, Planning Standard A (Organizational Control), Planning Standard F (Prompt Communications among Principal Response Organizations)]. (CATEGORY A DEFICIENCY)

Recommendation: The Department of Public Health and Civil Defense management teams must be informed immediately of all changes in plant status, meteorological conditions, field monitoring data, and the implications of the data for protective action recommendations. Therefore, the plan procedures should be reviewed and changed, as necessary, so that the information flow will become more rapid and comprehensive. All staff connected with the emergency operations should then be trained to recognize the implications of key data, and in the new reporting procedures.

EOF

(2) Description: Communication procedures between the states and the utility as given in their respective plans were not followed for the General Emergency classification, which caused serious delays in official notification of state and local governments. (FEMA-REP-1, Rev. 1, II, E.1). (CATEGORY A DEFICIENCY)

Recommendation: Review, revise, and coordinate plans among all parties to develop a better system for notification of state decision makers of changes in emergency classification levels.

(3) Description: The utility disseminated misleading and inacurrate public information, including protective action recommendations that could have conflicted with those recommended by State authorties. In a real incident, this would have confused the public. (FEMA-REP-1, Rev. 1, II, G.14). (CATEGORY A DEFICIENCY)

Recommendation: The utility should revise its method of developing and issuing news releases to ensure accuracy of content. It should reconsider its policy of making public its protective action recommendations before the states have been notified and have had the opportunity to consider the recommendations and take appropriate action.

B. Objectives for the Remedial Drill

The objectives for the drill held on June 6, 1985 to show correction of the three "Category A" deficiencies were as follows:

VERMONT YANKEE NUCLEAR POWER STATION

1. Demonstrate the ability to notify the appropriate state decision makers of changes in emergency classification levels in a timely manner.

2. Demonstrate the ability to develop and desseminate timely accurate news releases.

3. Demonstrate the ability to coordinate news releases with State Public Information representatives.

STATE OF NEW HAMPSHIRE

1. Demonstrate the ability for internal communications within the DPH.

2. Demonstrate the ability for internal communications between DPH and NHCDA in a timely manner.

3. Demonstrate the ability to integrate plant data with protective action recommendations in a timely manner.

C. Scenario for the Remedial Drill Initial Conditions

Initial Conditions

1. Unusual Event was declared at 8:30 a.m. June 6, 1985, by the shift supervisor. Unusual Event status was declared because of an indication of unidentified primary coolant leakage greater than 5 gpm evidenced by high containment sump flow.

2. The operations crew began to reduce power and the reactor is at 60% power at this time.

3. The High Pressure Coolant Injection System is out of service for maintenance. All check-outs of the back-up ECCS Systems were completed.

4. The operational conditions associated with the start of the exercise are provided on Table I.

5. The radiological conditions associated with the start of the exercise are provided on Table II.

6. Meteorological forecast:

-A backdoor cold front is expected to arrive in the area before noon. The Vernon area will be experiencing some light showers during the morning hours. The winds are expected to remain from the southwest for the next 6 to 8 hours ultimately shifting to south in the evening. Today's high is expected in the low 60's tonight, and near 70 tomorrow. Precipitation probability is 30 percent through tomorrow.-

7. The following weather conditions exist at 10:00 a.m.:

Wind Direction (from)	210°
Wind Speed	4 mph
Delta Temperature	-2.0° F
Ambient Temperature	65° F

SCENARIO

Scenario Time	Clock Time	
0 Min	1000	Start. Initial conditions are presented to players. Failure of circwater Recirculation Gate occurs causing recirculation to the intake to be completely shut off.
2 Min	1002	Turbine trips and MSIV Group I isolation occurs due to low condenser vacuum. Circulation water pumps tripped due to low intake level causing a reactor scram. Drywell pressure is
2 Min	1002	2.15 psig. High drywell floor drain sump alarm is received in control room.
5 Min	1005	Both drywell floor drain sump pumps were running for approximately three minutes indicating that primary coolant leakage is greater than 50gpm.
		** ALERT IS DECLARED**
		A.P. 3125 Coolant Inventory: Coolant leakage within the primary containment greater than 50gpm as indicated by continuous sump pumping.
10 Min	1010	ECCS initiates on high drywell pressure. Drywell floor drain pumps trip on Group II isolation. Standby gas treatment system is automatically initiated upon Group III isolation.
15 Min	1015	Efforts to maintain adequate flow into the RCS from auxiliary sources are started.
20 Min	1020	Control room investigating the cause of RCS leakage and discussing the possibility of de-inerting the containment to make drywell inspection.
25 Min	1025	Continue efforts to investigate the source of the RCS leakage and maintain adequate flow into the RCS.
30 Min	1030	"A" Recirculation Suction Line breaks off at the suction valve. Rapid depressurization of the reactor vessel occurs. Reactor water level decreases significantly. Drywell pressure is at 35 psig. Containment radiation levels have increased significantly. ECCS initiates to re-flood the reactor vessel.

35 Min	1035	ECCS make-up capability is unable to maintain reactor water level above -48 inches.
		** SITE AREA EMERGENCY DECLARED**
		A.P. 3125 Fuel Damage: Inability to maintain reactor water level above -48 inches with indication of potential significant in-core fuel damage.
45 Min	1045	Core has been re-flooded to two-thirds core height using the ECCS make-up capability. Reactor water level is being maintained above -48 inches. Drywell pressure has leveled off at 25 psig containment radiation levels have stabilized at 380 R/hr.
50 Min	1050	Control Room Operators have shutdown Core Spray pumps and the "B" Loop LPCI pumps to prevent core flooding.
		Operators are controlling vessel water at two-thirds core height with one RHR pump.
		Drywell pressure is continuing to decrease. Containment Radiation levels are starting to decrease.
55 Min	1055	Make-up Demineralizers have been started to ensure a demineralized water supply for core flooding purposes and proposed recovery planning of flooding the Containment up to the break.
60 min	1100	Control Rod Drive System Failure occurs which ejects 27 Control Rods from the north section of the core. Reactor goes prompt critical causing coremelt in the affected region of core.
		Coincident with the Control Rod Drive Failure, status lights on the Control Room Board indicate the drywell main vent value has backed off the fully closed position.
		Containment Radiation Levels have increased to greater than 1×10^4 R/hr.
		Primary Vent Stack Monitors indicate release of radioactivity to environment.
		Drywell pressure is decreasing more rapidly than expected.

Scenario Time	Clock Time	
60 Min	1100	** GENERAL EMERGENCY DECLARED ** A.P. 3125 FUEL DAMAGE: Plant conditions indicating loss of two out of three fission product barriers with the potential loss of third.
65 Min	1105	Control Room personnel inject highly concentrated borated water into core to control any further reactivity excursions and core damage (Stand-by Liquid Control System).
70 Min	1110	Team investigating the problem associated with drywell main vent valve report that 1 to 2 hours will be required to check the valve logic.
80 Min	1120	Containment Radiation levels have decreased to 5,000 R/hr.
100 Min	1140	Drywell main vent valve is sealed off and the valve is de-activated to prevent further use. Releases to the environment from the Primary Vent Stack are decreasing rapidly.
110 Min	1150	Primary Vent Stack Monitors indicate background levels. Release to environment has stopped.
120 Min	1200	Drill Terminated.

II. EXERCISE EVALUATIONS

The remedial drill of June 6, 1985 to demonstrate correction of the "Category A" deficiencies observed during the April 17, 1985 full-scale exercise of the Vermont Yankee Nuclear Power Plant included activation of the utilities' Emergency Operations Facility (EOF) in Vernon, Vermont; the State of New Hampshire Emergency Operations Center (EOC) in Concord, New Hampshire; the State of Vermont EOC in Waterbury, Vermont; and the Commonwealth of Massachusetts EOC in Framingham, Massachusetts. Reports of observations in each location follow.

A. Emergency Operations Facility (EOF)

The EOF was fully staffed by 9:55 a.m. when the first briefing on the pre-drill conditions was given to the representatives of the three states (MA, NH, and VT) by the Recovery Manager. Subsequent briefings on changes in plant status were given at regular, frequent intervals. Reports on prepared data forms were distributed at each briefing. Upon the conclusion of each one, the state representatives telefaxed the reports over new, high speed facsimile machines that had been provided for each state. They also gave an oral summary to their EOCs over dedicated landline telephones.

In addition, at each change in emergency classification level, the Recovery Manager followed his briefing of the state representative at the EOF with an oral briefing to the states over the Nuclear Alert System (NAS) ("orange phone"), a microwave wave telephone system with conference capability.

In this way, communication of changes in plant status were nearly instantaneous, and detailed data were disseminated rapidly and accurately, facilitating accident assessment and protective action recommendations at the State EOCs. The "Category A" deficiency was corrected at the EOF.

B. Media Center

There was a dramatic improvement in the conditions and operations of the Media Center during the remedial exercise. Clear, accurate, and timely news releases were issued by the utility on a frequent basis. In each case, the utility spokesperson conferred with the State PIOs to review the content of the news releases for possible changes or additions before they were issued. The utility appropriately deferred to the states the responsibility of issuing protective action recommendations to the public.

A new high speed facsimile machine was used to receive comprehensive plant status reports from the EOF. These reports were copied and distributed to each of the State PIOs affording them thorough briefings on the current status of the plant.

Media briefings were equally thorough and accurate. The utility provided a comprehensive array of charts, displays, and status boards which were

used effectively by the utility spokesman and the technical expert on hand to participate in the briefings. The State PIOs participated fully in each briefing, presenting the status of emergency conditions in their respective states.

The overall result was that the public would have received clear, accurate, coordinated, and timely information from the Media Center if this had been a real incident.

C. New Hampshire EOC

The two-hour remedial drill tested the new method of rapid transmisson of hard copy data directly from the New Hampshire DPH liaison staff at the EOF to the State EOC. The high speed telefax machine functioned well. Sixty-one pages with considerable, detailed data was transmitted in this fashion. There were four distinct formats in which messages were transmitted to the EOC from the EOF. They were: plant status messages, off-site and site boundary radiological values and plant and reactor system values, and general messages. All but the general message forms were preformatted. The preformatting of technical information in hard copy form, followed immediately by xeroxing and distribution at the State EOC, provided rapid transfer of information among all parties. In addition, the recovery manager at the EOF contacted New Hampshire (and the other States and the Media Center) over the NAS telephone as soon as there was any change in emergency classification level.

At 10:13 a.m., the New Hampshire DPH was notified from the EOF that an Alert was declared at 10:10 a.m. The Civil Defense Director and Governor's representative were informed within two minutes. Site Area Emergency was declared at 10:35 a.m. with hard copy "faxed" information reaching DPH at the State EOC at 10:43 a.m.

At 10:44 a.m., the Civil Defense Director received confirmation of this over the NAS telephone. At 11:11 a.m., DPH received notification from the EOF that a General Emergency was declared at 11:10. Notification was also received by Civil Defense over the NAS telephone.

During the Alert, Site Area, and General Emergency phases, there was good coordination between the activities at the Media Center and the State EOC. The Media Center coordinated in advance with the State EOC regarding their news briefing and press releases, and, similarly, New Hampshire coordinated in advance with the Media Center (and all other locations) their press releases, EBS messages, and protective action decisions.

During this exercise, the DPH accident assessment staff decided to accept the dose projection and protective action recommendation provided by the utility without performing their own separate calculations. The accident assessment staff kept the accident manager fully informed of the most current situations and their implications, and frequent technical briefings were held by the accident assessment staff with the operations and decision making personnel to keep them informed.

In accepting the utility's recommended protective action (evacuation of Hinsdale, sheltering in Winchester), DPH accident assessment team properly considered such factors as duration of the release as reported and the implications of the weather (incoming cold front).

Throughout the exercise, New Hampshire EOC operations staff simulated performing the many notifications and actions called for in their checklists at the various classification levels.

The June 6, 1985 remedial exercise provided an adequate demonstration of New Hampshire's ability to communicate accident assessment data in a timely fashion, both with the DPH accident assessment staff and between DPH management and the decision making staff in Civil Defense and the Governor's Office. This provided an adequate basis upon which to make protective action recommendations and decisions. FEMA strongly recommends that the utility and states retain the system of hard copy message transfer, and modify their planning accordingly.

D. Vermont EOC

The "Category A" deficiencies noted during the Vermont Nuclear Power Plant Exercise did not involve Vermont. However, the Vermont State EOC was manned by the Deputy State Emergency Management Director and other necessary staff during the remedial exercise.

First, emergency action levels were transmitted to the State EOC over the NAS telephone by the recovery manager at the EOF. Then, in each instance, the individual representing Vermont at the EOF, called the State Director at the EOC to confirm and provide additional information.

Finally, a high speed facsimile machine was used to send hard copies of an extensive amount of plant, radiological, meteorological, and plume plotting data to the EOC from the recovery manager at the EOF.

These three methods of transmitting information provided adequate data flow to the EOC for staff analysis and decision making.

E. Massachusetts EOC

The "Category A" deficiencies noted during the Vermont Yankee Nuclear Power Plant Exercise of April 17, 1985 did not involve Massachusetts, however, the MCDA participated in the remedial drill in order to assist the States of Vermont and New Hampshire in demonstrating their ability to notify Massachusetts of changes in plant status in a timely and accurate manner, and to demonstrate their ability to develop and disseminate messages/news releases rapidly and accurately.

Messages from the Vermont EOF and Vermont CD via the facsimile machine were clear and entirely legible. Sixteen messages were received in all. The time difference between telephone message over the NAS tele-

phone and receipt of the FAX message was minimal, depending on the number of pages to be dispatched. Telephone messages received from and sent to the other states and the EOF via the NAS telephone were clear and timely, therefore, the objectives of the drill were met.

III CONCLUSIONS

The three "Category A" deficiencies observed in the exercise of the radiological emergency response plan for the Vermont Yankee Nuclear Power Plant in Vernon, Vermont on April 17, 1985 have been addressed and corrected. Communications and information dissemination procedures have been much improved. In conclusion, there is reasonable assurance that appropriate measures can be taken off-site in the event of a radiological emergency to adequately protect the public health and safety.

FINAL EXERCISE ASSESSMENT

JOINT STATE AND LOCAL RADIOLOGICAL EMERGENCY RESPONSE EXERCISE FOR THE VERMONT YANKEE NUCLEAR POWER PLANT

VERNON, VERMONT

APRIL 17, 1985

FEDERAL EMERGENCY MANAGEMENT AGENCY

REGION I

John W. McCormack Post Office and Courthouse
Boston, Massachusetts 02109

VERMONT YANKEE NUCLEAR POWER PLANT

LICENSEE: Yankee Atomic Electric Company

LOCATION: Vernon, Vermont

DATE OF REPORT: August 19, 1985

DATE OF EXERCISE: April 17, 1985

PARTICIPANTS:

State of Vermont	State of New Hampshire	State of Massachusetts
Brattleboro, Vt.	Chesterfield, N.H.	Bernardston, Mass.
Dummerston, Vt.	Hinsdale, N.H.	Gill, Mass.
Guilford, Vt.	Richmond, N.H.	Greenfield, Mass.
Vernon, Vt.	Swanzey, N.H.	Leyden, Mass.
Bellows Falls, Vt.*	Winchester, N.H.	Northfield, Mass.
	Keene, N.H.*	Warwick, Mass.

NONPARTICIPANTS:

Colrain, Mass.; Halifax, Vt. (exempt because of recent participation in exercise for Yankee Rowe Atomic Power Plant)

*Relocation Center Community.

CONTENTS

CONTENTS (Cont'd)

FIGURES

TABLES

ABBREVIATIONS

ARES	Amateur Radio Emergency Services
CAP	Civil Air Patrol
CDNAVS	Civil Defense National Voice System
DOC	U.S. Department of Commerce
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EBS	Emergency Broadcast System
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	U.S. Environmental Protection Agency
EPZ	Emergency Planning Zone
FEMA	Federal Emergency Management Agency
HHS	U.S. Department of Health and Human Services
IFO	Incident Field Office
IRAP	Interagency Radiological Assistance Plan
KI	Potassium iodide
MCDA	Massachusetts Civil Defense Agency
MDPH	Massachusetts Department of Public Health
NAWAS	National Warning System
NHCDA	New Hampshire Civil Defense Agency
NRC	U.S. Nuclear Regulatory Commission
PAG	Protective Action Guide
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
RADEF	Radiological Defense
RERP	Radiological Emergency Response Plan
TLD	Thermoluminescent dosimeter
USDA	U.S. Department of Agriculture

SUMMARY

On Wednesday, April 17, 1985 the Federal Emergency Management Agency (FEMA) observed an exercise of the plans and preparedness for off-site radiological emergency response for the Vermont Yankee Nuclear Power Plant located in Vernon, Vermont. Following the exercise, a preliminary evaluation was made by a 39-member federal observer team, and briefings for exercise participants and the general public were held on Thursday, April 18, 1985 at the Vernon Elementary School. This document provides overviews, deficiencies, areas for improvement and recommendations for each of the jurisdictions and field activities tested in the exercise.

Each deficiency and a corresponding recommendation for corrective action is described by jurisdiction in Section 2 of this report. Areas for improvement, which are not considered deficiencies, also are described in Section 2. Section 3 provides a summary listing of the April 17, 1985 (1) deficiencies that would lead to a negative finding, and (2) other deficiencies, including those meriting priority attention. The summary is in a tabular format and includes space for the states and local jurisdictions to respond to the deficiencies.

Section 3 of this report also includes a Deficiency Tracking Table and a tabulated Status of Objectives. The Deficiency Tracking Table is a compilation of deficiencies identified at the April 17, 1985, September 21, 1983, and February 18, 1982 exercises and lists the current status of each deficiency. The Status of Objectives table lists the status of the FEMA 35 Core Objectives for each State and local jurisdiction by exercise year.

Vermont

The facilities at the State Emergency Operations Center (EOC) at Waterbury generally were good. Sufficient space was available for each of the organizations present; however, the staff tended to congregate in the operations room which became crowded and blocked the view of the wall maps and displays. Activation and staffing was performed adequately. The new radio paging system was used to notify EOC staff members for the first time. This system worked well with only minor problems. The EOC staff performed its assignments competently and displayed adequate training and knowledge. Management of the emergency operations generally was good. The Governor was present at the EOC for the entire exercise and was observed to be the primary decision maker. The Incident Director, delegated the responsibility of managing the EOC operations by the Governor, performed this function in a competent manner. However, some delays were observed during protective action decision making as the Governor, the Incident Director, and staff members conferred for extended periods prior to reaching a decision and in formulating the wording of protective action messages. Communications with the local EOCs using the radio telephone were improved over previous exercises. However, except for the Alert notification, communications regarding changes in the emergency condition did not come from the utility via the dedicated Nuclear Alert System (WESCOM SS-4A) as anticipated. Message handling within the EOC was good. Tri-State coordination with New Hampshire and Massachusetts also was good. The

ability to alert the public in a timely manner was demonstrated by actual and simulated EBS messages. However, EBS messages should have contained more detailed instructions to the public. Prior to issuing EBS messages, adequate coordination with the local EOCs was observed.

The Vermont State Radiological Laboratory in Montpelier is a small facility, adequate for routine environmental monitoring. However, the laboratory is not adequately equipped and the staff is not adequately prepared for the kind and number of samples which would result from a significant incident at the Vermont Yankee Nuclear Power Station. Additional facilities and training are required.

The Brattleboro IFO was activated and staffed for the exercise. However, not all agencies participated. The staff present were not fully familiar with emergency management concepts, and no effective centralized management or control of operations at the IFO were observed. The facilities at the IFO generally were good. However, as noted in previous exercises, the Brattleboro IFO is not habitable and is within the 10 mile EPZ and potentially would be required to evacuate to the alternate IFO in an actual emergency. Communications at the IFO were good, an improvement over previous exercises. Field monitoring teams were dispatched from the IFO and field readings were reported regularly. Implementation of procedures for traffic control and transportation were adequately demonstrated by IFO staff. However, both IFO staff and emergency workers dispatched from the IFO require additional training in radiological exposure control techniques. IFO staff were uncertain about evacuation bus route assignments and authorization for the dispatch of buses; additional training should take care of this problem.

The Vermont field monitoring teams had adequate equipment for exposure rate monitoring; however, some deficiencies were observed. Some key components could only be run on internal battery power; only one of the two teams had instrumentation for detecting radioiodine, an air pump adapter was missing; the instrument for counting radioiodine samples was inoperative due to failure of the electronic readout; and some of the instruments did not show a calibration date. Adequate equipment for taking milk and water samples was present. The need for additional training for the monitoring teams was apparent since there were some weak areas observed in the technical operations. Radio communications with the EOC were good; however, the plan indicates that, normally, communications are to be through the IFO. Because it worked well, consideration should be given to modifying the plan to indicate the desirability of direct communications with the state EOC. The field teams had adequate self reading dosimeters, KI, and knowledge of their use. However, only one team had a permanent record dosimeter. As noted in previous exercises, the low dose limits allowable for Vermont field teams renders them incapable of providing adequate information on plume boundary and field verification of dose projections.

The Bellows Falls relocation center was quickly and efficiently activated and staffed. The facilities are good, with separate areas for reception, monitoring/decontamination, and mass care. There was some initial misunderstanding among the staff as to where the monitoring/decontamination was to take place. The mass care center can accommodate up to 800 persons. The staff generally was well trained and

performed their duties in a professional manner. Some improvement can be made in use of registration forms and identification tags at the facility.

Four local EOCs participated in the exercise: Brattleboro, Dummerston, Guilford, and Vernon. The facilities at these EOCs generally were adequate; however, backup power and facilities for extended operations (kitchen, bunks, showers) were lacking in the Dummerston EOC. Improved air circulation also is required in the Brattleboro EOC. Activation and staffing was adequately demonstrated at all EOCs except for Vernon where the staff were prepositioned. Emergency staffs generally performed well. Management of EOC operations was good overall. The Brattleboro staff, however, need training in assessing accident information provided to them. At the Vernon EOC the staff did not have a clear understanding of what decisions were to be made by the state and which were to be made locally. In addition, the Director and the Vernon EOC should delegate the routine tasks to other staff members. The communications systems at the EOCs generally were adequate. However, similar to the previous exercise, occasional problems with the primary radio-telephone system were observed at all of the EOCs except Vernon. Public alerting was demonstrated at the EOCs by activities such as simulated dispatching of alerting vehicles and simulated EBS message with siren sounding. All EOCs need additional training in radiological exposure control procedures. The existing procedures demonstrated either were weak or inconsistent. Permanent record dosimeters were not available at any of the EOCs.

New Hampshire

The layout and space in the new State EOC is much improved over that of their previous facility. Appropriate maps were either posted or available in other formats. The emergency classification level was posted, although the status board was not kept current because of internal communications problems. Alerting and mobilization of staff went well. Operations management was adequately demonstrated overall. The Civil Defense Director was in charge and held frequent briefings; however, because of internal communication problems, the information was not always current. Staff were involved in decision making to the extent that the fast moving scenario allowed. The governor's representative displayed a good knowledge of New Hampshire's radiological emergency response planning.

Message handling was improved over the last exercise. Hard copy forms were used, and the Operations officer had full time assistance in handling message distribution within the EOC. The Civil Defense Radio Network functioned better this time than in the previous exercise. However, reception between the State EOC and IFO was still poor, and the field monitoring teams operating in the Hinsdale area still experienced some blind spots. The Nuclear Alert System (NAS) dedicated telephones which connected the EOF, and the Massachusetts, New Hampshire, and Vermont State EOCs provided a very effective means for interstate coordination.

There were problems in the protective action recommendation and decision making processes which resulted in the Governor being supplied with insufficient information to make a fully informed protective action decision. Internal communications within the DPH accident assessment staff, and coordination between

Civil Defense and DPH were primarily responsible for this result. It should be noted, however, that the poor control of information at the EOF by the utility, particularly in the area of weather forecasting, exacerbated this problem.

At the Keene IFO, activation and staffing proceeded well. Communications were improved over last year with the local communities; however, the Civil Defense radio system still needs some improvements for communication with the State EOC and field teams in valley areas. Field monitoring teams were deployed from the IFO. They are better equipped then previously noted. However, considering the problems they experienced in valley areas with the Civil Defense radios, they need a more convenient and readily available back-up communications ystem than commercial telephone. The field teams would benefit, both in terms of timelines and effectiveness, from being deployed directly from the EOF. Similarly, most of the Civil Defense functions assigned to the IFO are duplicative of those being performed at the State EOC. Other than maintaining a back-up communications capability in Keene, there does not seem to be any reason for retaining the IFO structure in New Hampshire.

There were no major difficulties noted at the five local New Hampshire EOCs.

Massachusetts

By prior agreement the scenario and stated objectives limited involvement of the State and Area IV EOCs. Participation nevertheless was good, and staffing was complete. Activation and staffing occurred promptly. Operations were managed well and the ability to coordinate activities with Vermont and New Hampshire were demonstrated. Communications continue to improve; problems that did occur were isolated and minor and attributable to limited experience with new equipment.

Six local EOCs, staffed entirely by volunteers, participated. Activation, staffing, management and communications capabilities were demonstrated at most locations. Permanent record dosimeters still were not available and displays could have been better and more effectively used. Many local communities are sparsely populated, some having as few as 500 people, and are severely limited in personnel resources.

Massachusetts plans call for the State to provide technical assistance to the local EOCs as needed. Although some of the local EOCs were short staffed and could have, in some instances, provided a better response during the exercise, this was not done. In one instance State assistance was provided, but not as a part of the planned response; the person provided by the State was supposed to have acted as a controller.

Utility and State Coordination

The EOF was adequately staffed by health department representatives of all three states. Radiological Health information flow from the Recovery Manager to the states was basically timely: however, internal flow of utility generated information to the Recovery Manager was not consistent.

The communication of changes in emergency classification levels by the utility to the states was not done in accordance with the plans. This caused important information (for example, the declaration of a General Emergency) to be delayed in reaching state decision makers.

The Media center in Dalem's Chalet experienced serious coordination problems throughout this exercise. Utility generated releases were not fully coordinated in advance with state PIO representatives at the Media Center. Furthermore, some of the releases contained erroneous information, which, if it had been a real situation, would have caused confusion among the public.

1 INTRODUCTION

1.1 EXERCISE BACKGROUND

On December 7, 1979, the President directed the Federal Emergency Management Agency (FEMA) to assume lead responsibility for all off-site nuclear planning and response. FEMA's basic responsibilities in Fixed Nuclear Facility Radiological Emergency Planning include:

- Taking the lead in off-site emergency planning and in the review and evaluation of State and local government emergency plans for adequacy.

- Determining whether the plans can be implemented on the basis of observation and evaluation of exercises conducted by emergency response jurisdictions.

- Coordinating the activities of volunteer organizations and other involved federal agencies such as:

  - Nuclear Regulatory Commission (NRC)
  - Environmental Protection Agency (EPA)
  - U.S. Department of Energy (DOE)
  - U.S. Department of Health and Human Services (HHS)
  - U.S. Department of Transportation (DOT)
  - U.S. Department of Agriculture (USDA)
  - U.S. Department of Commerce (DOC)

Representatives of most of these agencies serve as members of the Regional Assistance Committee (RAC), which is chaired by FEMA.

Emergency plans for the Vermont Yankee Nuclear Power Plant in Vernon, Vermont, were formally submitted to the RAC by the States of Vermont, Massachusetts, and New Hampshire and involved local jurisdictions. The submission of the plans was followed closely by the exercising (in 1982), critiquing, and evaluation of the plans. A public meeting was held to acquaint the public with contents of the plans, answer questions about them, and receive suggestions on the plans.

The second and third radiological emergency exercises were conducted on September 21, 1983, and April 17, 1985 to reassess the adequacy of the State and local emergency preparedness organizations and their capability to protect the public in a radiological emergency involving the Vermont Yankee Nuclear Power Plant. Figure 1 shows the communities within and surrounding the Vermont Yankee 10-mile plume emergency planning zone (EPZ).

An observer team consisting of FEMA personnel, RAC members, and support personnel from federal and State agencies evaluated the April 17, 1985 exercise. A total of 39 observers were assigned to evaluate State, local, and field activities. Observers

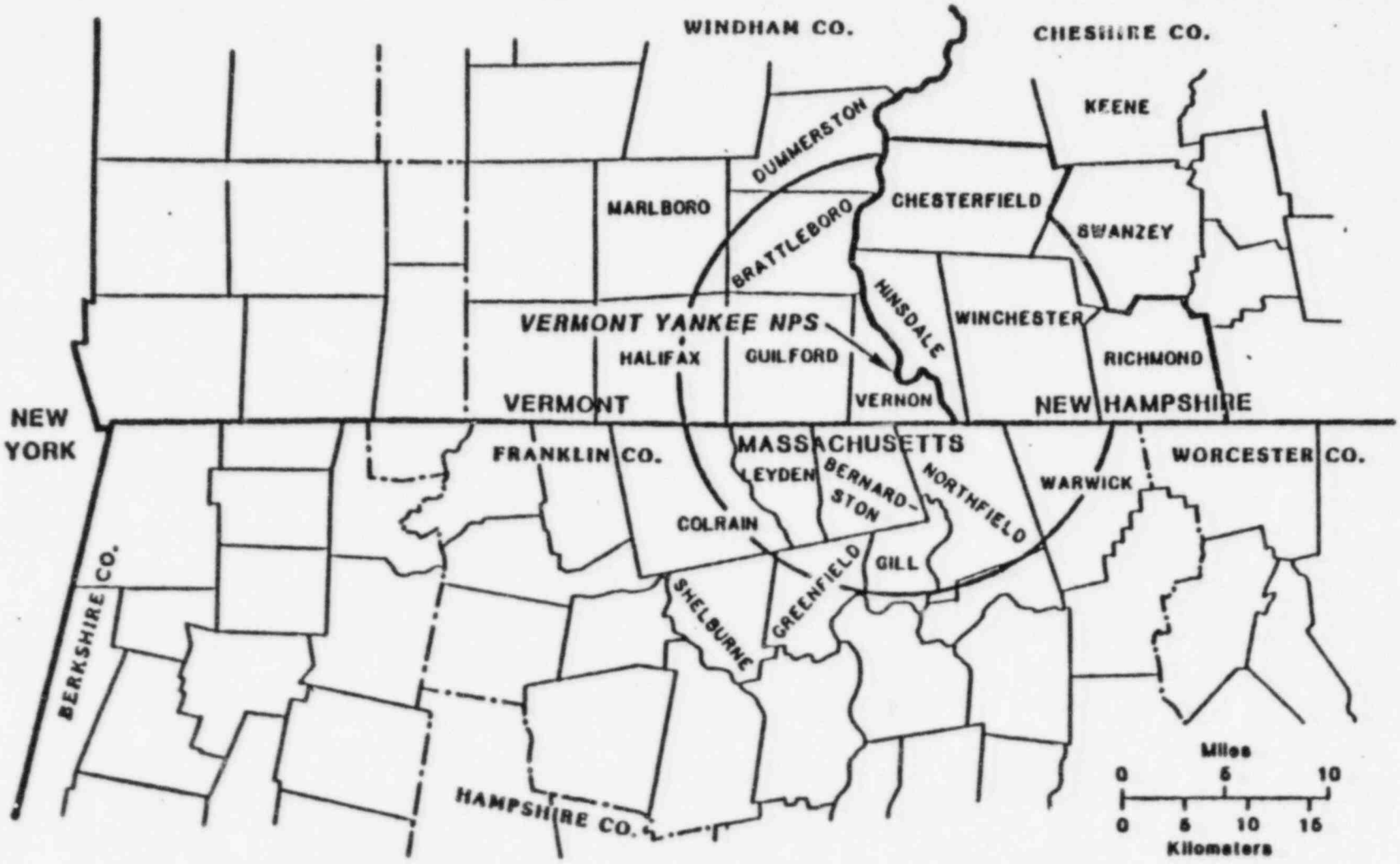

FIGURE 1 Plume EPZ of the Vermont Yankee Nuclear Power Plant

were trained in radiological emergency planning concepts and given evaluation kits containing information on the exercise objectives, exercise scenario, previously identified deficiencies, and other pertinent data. Team leaders coordinated the evaluation of team operations and consolidated the findings.

After the exercise, the federal observers met to review their observations. The intent of this meeting was to present site-specific observations and develop the preliminary findings that are detailed in this final exercise report. A public critique of the exercise for the exercise participants and general public was held at 2:00 p.m. on April 18, 1985, at the Vernon Elementary School.

The findings presented in this report were reviewed by the RAC Chairman of FEMA Region I. FEMA suggests that state and local jurisdictions take remedial actions in response to each of the deficiencies indicated in this report and that the states submit a schedule for addressing the identified deficiencies. The Regional Director of FEMA is responsible for certifying to the FEMA Associate Director of State and Local Programs and Support, Washington, D.C., that any deficiencies observed during the exercise have been corrected and that such corrections have been incorporated into State and local plans, as appropriate.

1.2 FEDERAL OBSERVERS

Thirty-nine federal observers were located at off-site emergency response functions. These individuals, their agencies, and their exercise location(s) are given below.

Observer	Agency	Location
Edward A. Thomas, RAC Chairman	FEMA	General Observation
Lawrence Robertson, Team Leader	FEMA	Vermont State EOC[b]
Robert Rospenda	FEMA[c]	Vermont State EOC
Joseph H. Keller	INEL[k]	Vermont State EOC
Bruce J. Swiren, Team Leader	FEMA	New Hampshire State EOC
Frederick Oleson	FEMA	New Hampshire State EOC
Thomas Baldwin	FEMA[c]	New Hampshire State EOC
Floyd Davis Team Leader	FEMA[c]	Massachusetts State EOC
Ellen Rooney	FEMA	Massachusetts State EOC

Kenneth L. Horak	FEMA	Dalem's Chalet Media Center
Byron Keene	EPA[h]	Emergency Operations Facility
Sue Ann Curtis Anthony Foltman	FEMA[c] FEMA[c]	Incident Field Office, Brattleboro, Vermont
Rudolph Zantopp	BNL[d]	Vermont Field Monitoring
Rochelle Honkus	INEL[k]	Vermont Field Monitoring
William Gasper Neil Gaeta	FEMA[c] FDA[f]	Incident Field Office, Keene, New Hampshire
Craig Gordon	NRC[g]	New Hampshire Field Monitoring
Richard Liberace	FDA[f]	New Hampshire Field Monitoring
Donald Connors	ARC[i]	Keene State College, New Hampshire, Relocation Center
Jeffrey Dexter	ARC[i]	Relocation Center, Bellows Falls, Vermont
George Hatch	FEMA	Area IV EOC, Belchertown, Massachusetts
Lt. James Smith	USCG[e]	Access Control
Rebecca S. Thomson, Team Leader	FEMA	EOC, Brattleboro, Vermont
William Vinikour	FEMA[c]	EOC, Brattleboro, Vermont
Elizabeth Dionne	FEMA	EOC, Dummerston, Vermont
James Nagle	FEMA[c]	EOC, Guilford, Vermont
Robert Sonnichson	FEMA	EOC, Vernon, Vermont
Carolyn Herzenberg	FEMA[c]	EOC, Chesterfield, New Hampshire
Jack Dolan, Team Leader	FEMA	EOC, Hinsdale, New Hampshire
Anna Hart	USDA[l]	EOC, Richmond, New Hampshire
Frank Kay	FEMA[c]	EOC, Swanzey, New Hampshire
Richard Quinn	FEMA	EOC, Winchester, New Hampshire
Kevin Merli, Team Leader	FEMA	EOC, Northfield, Massachusetts

William Knoerzer	FEMA[c]	EOC, Bernardston, Massachusetts
Kenneth Lerner	FEMA[c]	EOC, Gill, Massachusetts
Kim Suchy	FEMA[c]	EOC, Greenfield, Massachusetts
Ann Volpe	FEMA	EOC, Leyden, Massachusetts
Michael Goetz	FEMA	EOC, Warwick, Massachusetts

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[a]RAC = Regional Assistance Committee
[b]EOC = Emergency Operations Center
[c]Contract Employee from Argonne National Laboratory, U.S. Department of Energy
[d]BNL = Brookhaven National Laboratory, U.S. Department of Energy
[e]USCG = U.S. Coast Guard, U.S. Department of Transportation
[f]FDA = U.S. Food and Drug Administration
[g]NRC = Nuclear Regulatory Commission
[h]EPA = U.S. Environmental Protection Agency
[i]American Rad Cross Representative
[j]DOA = U.S. Department of Agriculture
[k]INEL = Idaho National Engineering Laboratory
[l]USDA = U.S. Department of Agriculture

1.3 EXERCISE OBJECTIVES

The exercise objectives of the states and local communities were to demonstrate that their emergency response plans, operations, and capability for mobilizing and coordinating needed resources are adequate to cope with an emergency at the Vermont Yankee Nuclear Power Plant.

1.3.1 Vermont Objectives

Specific objectives of the State of Vermont were to:

1. Demonstrate the efficiency of emergency facility and staff operations.
2. Demonstrate the effectiveness of field communications.
3. Demonstrate the field team mobilization and sampling techniques.
4. Demonstrate radiation exposure projection techniques.
5. Demonstrate initial public alerting and notification.
6. Demonstrate the ability to disseminate protective action messages to the public.

7. Demonstrate the ability to make decisions and allocate resources for an orderly evacuation.

8. Demonstrate the ability to monitor and control emergency worker exposure.

9. Demonstrate the coordination of and appropriateness of information released to the media.

10. Demonstrate the adequacy of relocation center facilities and procedures.

11. Demonstrate the ability to determine the need for and to request federal assistance.

12. Demonstrate interstate coordination.

1.3.2 New Hampshire Objectives

Specific objectives of the State of New Hampshire were as follows:

1. Notification Methods and Procedures: To test the procedures established to notify and mobilize the State and local emergency response organizations in New Hampshire. Specifically to test the ability of State and local emergency response organizations to mobilize, staff, and operate the State EOC, local EOCs, the IFO, EOF, media center, reception center and support facilities, and to maintain appropriate staffing for those facilities for 24-hour operations.

2. Emergency Communication: To test the communications systems linking Vermont Yankee, New Hampshire, Vermont, and Massachusetts emergency response agencies as well as communications between State and local organizations within the New Hampshire plume exposure EPZ and test the ability of field monitoring teams to communicate with the IFO, State EOC, and EOF as appropriate.

3. Direction and Control: To exercise the ability of key personnel within the principal State and local emergency response organizations to implement and coordinate the functions for which they are responsible. Specifically to coordinate emergency activities, and to organize resources necessary to implement an evacuation of all or part of the plume exposure EPZ. Organize and coordinate resources necessary to support an evacuation in the event of adverse weather or traffic obstructions and coordinate and implement evacuation of the elderly, school children, and the mobility

impaired. To organize the resources necessary to control access to an evacuated area.

4. Public Information: To test the ability of New Hampshire to disseminate information to the public and to the news media, in conjunction with Vermont, Massachusetts, and the utility. Specifically to test the ability to provide coordination of information prior to release to the media, to brief the media in a clear, accurate and timely manner, and to provide rumor control.

5. Accident Assessment: To test the State's ability to assess available radiological data supplied by the utility, to estimate the consequences of the scenario and to recommend protective actions necessary to maintain public health and safety. Test the ability to deploy field monitoring teams. Test monitoring team procedures and ability to effectively use field monitoring equipment for determining ambient radiation levels to include procedures for the measurement of radioiodine. To project exposure to the public via plume travel projections and field data and to determine appropriate protective actions based on PAGs.

6. Protective Response: To test the ability to initiate and implement protective response actions for the plume exposure EPZ based upon accident assessment. Demonstrate the ability to estimate population exposure. To test the ability to determine when the use of KI is necessary. To evaluate the ability of the State to distribute KI as necessary. To test the ability of Emergency Worker Exposure Control, etc.

7. Emergency Facilities: To evaluate State and local Emergency Operations Centers. Specifically to identify the adequacy of facilities and displays to support Emergency Operations. It should be noted that New Hampshire Civil Defense has moved to a new building and that this exercise will be the first exercise held in this facility.

8. Emergency Response Support: To evaluate the ability of the State to mobilize logistical support services including reception facilities, medical facilities, and transportation services. To test the ability of State and Local Decontamination of Emergency Workers, etc. To evaluate the State's ability to request Federal assistance.

9. Emergency Public Notification/Emergency Public Information: To assess the ability to notify the public within plume exposure EPZ, and disseminate initial instructions. To formulate and coordinate with Massachusetts and Vermont emergency public information, and to disseminate it to the public throughout the emergency situation.

10. Recovery and Re-Entry: To determine and implement measures for a controlled recovery from a radiological emergency within the State.

1.3.3 Massachusetts Objectives

A. Civil Defense Agency Objectives

1. Demonstrate ability to mobilize staff and activate facilities promptly.

2. Demonstrate ability to fully staff facilities and maintain staffing around the clock.

3. Demonstrate ability to make decisions and to coordinate emergency activities.

4. Demonstrate ability to communicate with all appropriate locations, organizations, and field personnel.

5. Demonstrate ability to alert the public within the 10-mile EPZ, and disseminate an initial instructional message, within 15 minutes.

6. Demonstrate ability to formulate and distribute appropriate instructions to the public, in a timely fashion.

7. Demonstrate ability to establish and operate rumor control in a coordinated fashion.

8. Demonstrate interstate coordination between Vermont, Massachusetts, and New Hampshire.

9. Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, as inclement weather or traffic obstructions.

10. Demonstrate the organizational ability and resources necessary to control access to an evacuated area.

11. Demonstrate the organizational ability and resources necessary to effect an orderly evacuation of mobility impaired individuals within the plume EPZ.

B. Radiation Control Agency Objectives

1. Demonstrate ability to make decisions and coordinate emergency activities.

2. Demonstrate adequacy of facilities and displays to support emergency operations.

3. Demonstrate ability to communicate with all appropriate locations, organizations, and field personnel.

4. Demonstrate ability to project doses to the public via plume exposure, based on plant and field data, and to determine appropriate protective measures, based on PAGs, available shelter, evacuation time estimates, and all other appropriate factors.

5. Demonstrate ability to continuously monitor and control emergency worker exposure.

6. Demonstrate ability to identify need for, request, and obtain Federal assistance.

7. Demonstrate ability to estimate total population exposure.

8. Demonstrate interstate coordination between Vermont and Massachusetts.

1.4 EXERCISE SCENARIO

Because of elevated coolant activity conditions at the plant, a controlled shutdown for refueling was planned to commence at 4:00 p.m. on April 17, 1985. The meteorological conditions were unsettled and a backdoor cold front arrived in the area before noon. The Vernon area experienced thunderstorm activity with periods of moderate to heavy rainfall during the morning hours. Increasing coolant activity levels at the plant caused the Shift Supervisor to request that more frequent sampling be conducted. As a result, chemistry personnel drew a coolant sample and determined the results.

The exercise events at the Vermont Yankee Nuclear Power Plant began at about 5:30 a.m. when the Shift Supervisor was notified that the results of the 96 hour coolant sample indicated Iodine concentrations of 1.1 μCi/g Dose equivalent I-131. Since this level is at the Technical Specification limiting conditions for operation, the Shift Supervisor reviewed this condition against the Emergency Action Levels and declared an Unusual Event. Between 5:30 and 5:45 a.m. both the State Police and the NRC were notified of the plant status and the proposed corrective measures in accordance with established procedures.

At approximately 6:15 a.m. the plant operators commenced shutdown at a rate of ¼ % power level per minute. Between 6:15 and 6:45 a.m. the State Health Department representatives responded to the initial notification and questioned plant status. At this time all data indicated a normal shutdown condition under elevated coolant activity

levels. Between 7:15 and 8:00 a.m., as the 50% power level was reached, the plant operators initiated control rod insertion. At 8:00 a.m. lightening struck the stack. A power surge created by the lightening strike caused some panel alarms to become inoperable and some to be alarming spuriously. Several monitoring systems were lost because of the lightening strike.

At 8:10 a.m. both the EOF and TSC Coordinators were contacted and consulted concerning escalation of the emergency class from Unusual Event to an Alert. At 8:15 a.m. an Alert was declared based on the following EAL: "Severe lightening which disables a safety system or safety system function." At this time the operational and radiological data reflected a degraded system response condition caused by the lightening strike and elevated coolant conditions. The State Police of Vermont, Massachusetts, and New Hampshire were notified between 8:15 and 8:45 a.m. In addition, the NRC was notified via the ENS communication link. The Engineering Support Center was activated. Between 8:15 and 8:45 a.m. the Technical Support Center determined that an Auxiliary Operator was missing. A Search and Rescue team discovered that the Auxiliary Operator had fallen off a ladder and was injured. Off-site medical attention was required for this individual. Between 8:45 and 9:00 a.m. all emergency centers were to be fully activated and State response personnel reported to the EOF.

At 9:10 a.m. lightening struck the plant a second time causing a Group I isolation and the plant was to scram. Between 9:10 and 9:30 a.m. the plant Emergency Director declared a Site Area Emergency upon recognition of the following condition: "Loss of all CR panel alarms during a plant transient". The States were notified of the escalation to a Site Area Emergency. Unknown to the plant at the time, there was a massive fuel assembly failure caused by pellet-clad stress and the mechanical shock of the scram. The reactor coolant activity levels increased from a total noble gas concentration of 1.2 μCi/g to 13.5μ Ci/g and a total iodine concentration of 1.5 μCi/g to 22.0 μCi/g. Operational and radiological details associated with this time frame reflected additional instrumentation lost coincident with a rising in-plant radiological condition.

Between 9:30 and 10:15 a.m. a release was in progress and the EOF was requested to evaluate the off-site dose conditions. Based on estimates of the off-site dose projections, the plant and EOF staff determined that a General Emergency should be declared. The states were then notified of the escalation to the General Emergency condition. The EOF Coordinator directed the taking of a site boundary survey in the downwind direction. Between 9:30 and 10:15 a.m., protective action recommendations were formulated. The survey team reported radiation levels. At this time, state response personnel arrived at the EOF and began interacting with the Vermont Yankee Emergency Response Organization. The EOF expedited additional off-site monitoring in downwind directions. Between 10:15 and 10:45 a.m. the off-site monitoring teams reported the measured radiation levels. Thyroid dose projections using field data are performed. At this time, the off-site protective action recommendations were reviewed based on the recognized iodine levels and exposure duration. The release terminated at 10:30 a.m. Plume tracking continued at downwind locations. The staff at the Media Center considered the possibility of relocation based on dose projections.

Between 10:15 and 10:45 a.m. the plume front continued moving up-river and precipitation continued. At the plant, at 10:45 a.m. the radiation monitoring system,

previously lost as a result of the lightening strike, was restored and returned to service. Between 10:45 and 11:15 a.m. the rain decreased. Between 11:45 a.m. and 12:00 p.m., plant data indicated elevated plant radiation levels caused by the plume passing over the plant site.

Discussions concerning de-escalation began between 12:15 p.m. and 2:00 p.m. because of improving plant conditions. At 1:00 p.m. the plume entered Massachusetts. However, the maximum dose rate decreased to less than 60 mR/hr. De-escalation to Alert because of the reduction in observed dose rates occurred at 1:00 p.m.

At 1:00 p.m. State and plant teams determined that iodine deposition levels in Vermont were relatively high. Recovery planning was discussed, including the environmental sampling of milk, vegetables, and water.

The exercise terminated between 2:00 and 3:00 p.m.

1.5 EVALUATION CRITERIA

The exercise evaluations presented in Section 2 are based on applicable planning standards and evaluation criteria set forth in Section [illegible] of NUREG-0654, FEMA-REP-1, Rev. 1 (Nov. 1980). Following the overview narrative for each jurisdiction or activity, deficiencies and areas for improvement are presented with accompanying recommendations. Deficiencies can be presented in two categories. The first ("Category A") lists only those deficiencies that caused a finding that off-site emergency preparedness was not adequate to provide assurance that appropriate measures can and will be taken to protect the health and safety of the public living in the vicinity of the site in a radiological emergency. These are deficiencies that lead to a negative finding. A negative finding must be based on at least one deficiency of this type. Three deficiencies in this category were observed.

The second category ("Category B") includes deficiencies where demonstrated performance during the exercise was considered faulty, and corrective actions are considered necessary. Those deficiencies identified by an asterisk (*) in this category merit priority attention.

Areas for improvement also are listed as appropriate for each jurisdiction or activity. These items are not deficiencies; rather, they are suggestions for improved performance.

TABLE 1
SEQUENCE OF EVENTS - OFF-SITE

	UNUSUAL EVENT	ALERT	EOC ACTIV'D	EOC OPER-ATN'L	SITE AREA EMERG.	GEN. EMERG	PUBLIC ALERT	EBS MESGS. SENT	SHLTR	EVAC.	STATE OF EMG. DECLARED	DOWN-GRADE TO ALERT	TERMI-NATION OF EX.
SCHEDULED SCENARIO TIME	6:15 am	8:15 am	8:15 am	8:45 am	9:10 am	10:00 am	---	---	---	---	---	1:00 pm	2:30 pm
UTILITY EOF	---	8:23	8:23	9:15	9:14	10:00	N/A	N/A	10:05	11:47	N/D	2:47	2:47
VT. EOC	6:03	8:31	8:40	8:40	9:25	10:00	---	10:05	9:41	11:40	11:40	2:30	
VT. IFO	---	8:48	8:48	10:25	9:25	10:09	---	---	10:33	11:52	11:52	2:45	2:50
NH EOC	6:11	8:38	8:42	9:07	9:25	10:17	10:00	10:05	N/A	10:45	10:45	2:32	2:50
NH IFO	6:18	8:38	9:00	9:15	9:28	10:22	---	---	---	10:45	10:51	2:30	2:42
MA EOC	6:17	8:41	8:45	8:50	9:29	10:20	10:00	10:05	12:41 12:47	---	10:45	2:30	2:50
MA AREA IV	6:03	8:30	8:30	8:40	9:23	10:20	---	---	12:30	---	---	2:36	2:50
MEDIA CTR	6:06	8:30	---	---	9:15	10:02	10:10	10:05	10:23	11:50	10:47 (MA)	2:45	3:14

TABLE 1
VERMONT
SEQUENCE OF EVENTS - OFF-SITE

	UNUSUAL EVENT	ALERT	EOC ACTIV'D	EOC OPER-ATN'L	SITE AREA EMERG.	GEN. EMERG	PUBLIC ALERT	EBS MESGS. SENT	SHLTR	EVAC.	STATE OF EMG. DECLARED	DOWN-GRADE TO ALERT	TERMI-NATION OF EX.
SCHEDULED SCENARIO TIME	6:15 am	8:15 am	8:15 am	8:45 am	9:10 am	10:00 am	---	---	---	---	---	1:00 pm	2:30 pm
UTILITY EOF	---	8:23	8:23	9:15	9:14	10:00	N/A	N/A	10:05	11:47	N/O	2:47	2:47
VT EOC	6:03	8:31	8:40	8:40	9:25	10:00	---	10:05	9:41	11:40	11:40	2:30	
							LOCAL EOCs						
Brattleboro	6:30	8:36	8:36	8:51	9:25	10:08	10:12	9:58	9:58	11:45	11:45	2:50	3:00
Dummerston	6:20	8:40	8:50	8:55	9:40	10:07	---	---	---	---	11:45	2:40	3:00
Guilford	---	8:44	8:45	8:45	9:25	10:13	---	---	10:06	---	---	2:43	3:02
Vernon	6:16	8:39	7:00 Prior to Alert	8:50	9:28	10:04	10:30	10:02	Dairy 10:02 (Dairy Anim)	12:00	11:43	2:45	3:03

TABLE 1
NEW HAMPSHIRE
SEQUENCE OF EVENTS - OFF-SITE

	UNUSUAL EVENT	ALERT	EOC ACTIV'D	EOC OPER-ATN'L	SITE AREA EMERG.	GEN. EMERG	PUBLIC ALERT	EBS MESGS. SENT	SHLTR	EVAC.	STATE OF EMG. DECLARED	DOWN-GRADE TO ALERT	TERMI-NATION OF EX.
SCHEDULED SCENARIO TIME	6:15 am	8:15 am	8:15 am	8:45 am	9:10 am	10:00 am	---	---	---	---	---	1:00 pm	2:30 pm
UTILITY EOF	---	8:23	8:23	9:15	9:14	10:00	N/A	N/A	10:05	11:47	N/O	2:47	2:47
NH EOF	6:11	8:38	8:42	9:07	9:25	10:17	10:00	10:05	N/A	10:45	10:45	2:32	2:50
							LOCAL EOCs						
Chesterfield	6:20	8:43	9:34	9:50	9:34	10:28	9:55	---	---	10:48	---	---	---
Hinsdale	6:15	8:37	6:15	7:30	9:34	10:28	10:08	---	---	10:45	---	---	2:42
Richmond	6:21	8:40	9:00	9:50	9:32	10:30	10:11	9:55	---	---	10:30	---	2:47
Swanzey	6:15	8:45	8:45	10:12	9:27	10:36	10:55	---	---	---	---	---	2:44
Winchester	6:15	8:40	7:30	9:45	9:31	10:26	10:20	---	---	---	---	---	2:45

TABLE 1
MASSACHUSETTS
SEQUENCE OF EVENTS - OFF-SITE

	UNUSUAL EVENT	ALERT	EOC ACTIV'D	EOC OPER-ATN'L	SITE AREA EMERG.	GEN. EMERG	PUBLIC ALERT	EBS MESGS. SENT	SHLTR	EVAC.	STATE OF EMG. DECLARED	DOWN-GRADE TO ALERT	TERMI-NATION OF EX.
SCHEDULED SCENARIO TIME	6:15 am	8:15 am	8:15 am	8:45 am	9:10 am	10:00 am	---	---	---	---	---	1:00 pm	2:30 pm
UTILITY EOF	---	8:23	8:23	9:15	9:14	10:00	N/A	N/A	10:05	11:47	N/O	2:47	2:47
MA EOC	6:17	8:41	8:45	8:50	9:29	10:20	10:00	10:05	12:41 12:47	---	10:45	2:30	2:50
							LOCAL EOCs						
Bernardston	---	8:30	8:50	9:00	9:38	10:38	9:53	---	12:45	---	10:55	2:45	2:58
Gill	---	8:41	7:45	10:00	9:33	10:43	9:56	---	12:57	---	11:11	2:45	3:00
Greenfield	6:15	8:38	8:38	9:00	9:23	10:32	---	---	---	---	11:11	2:47	2:50
Leyden	---	8:50	7:30	9:45	9:35	10:43	---	---	---	---	11:03	2:45	2:57
Northfield	---	8:40	8:50	9:00	9:33	10:47	12:45	---	12:45	---	11:06	2:45	2:53
Warwick	---	8:42	8:45	---	9:37	10:47	9:53	---	---	---	11:11	2:45	2:55

2 EXERCISE EVALUATIONS

2.1 VERMONT STATE OPERATIONS

The State of Vermont activated and tested the State EOC in Waterbury, Vermont; the Brattleboro Incident Field Office (IFO); two radiological field monitoring teams; the Bellows Falls Relocation Center; and four local EOCs. The Media Center located at Dalem's Chalet in Brattleboro, Vermont, was also activated, and the overview is included in Section 2.4.2.

2.1.1 Vermont State EOC

The Vermont State EOC is located in Waterbury on the grounds of the Vermont State Hospital. The facilities were generally good and are considered adequate. Separate rooms are available for all the key organizations present, providing adequate working space for staff members. However, during the exercise, due to the relatively fast-moving events during the morning, the staff tended to congregate in the Operations Room, which became crowded and somewhat noisy.

Since the EOC is located at the State Hospital, there would be adequate eating and sleeping facilities for extended operations. Maps and displays were mounted on the walls in the Operations Room. However, due to the large number of staff members who congregated there during the exercise, many of these displays were partially obscured, and this diminished their usefulness. One of the status boards was also not fully updated during the exercise. However, the map illustrating the plume location was especially good and was readily visible to all. Other maps and displays illustrated the locations of relocation centers, traffic control points, plume EPZ by sectors, and chronological summaries of key messages and emergency action levels. An overhead projector was also used to project the message communicating the most recent change in plant status. However, due to the large number of people congregating in the Operations Room, this projected message was often blocked from view.

The State of Vermont adequately demonstrated its ability to activate and staff the EOC in Waterbury. Additional radio-pagers were obtained for use by State officials and were used for the first time to notify EOC staff members for this exercise. The radio-pagers were used to notify these individuals of both the Unusual Event and the extended notification list for Alert. The use of the radio-pagers generally worked well and corrected a previous deficiency (#2). Only minor problems were observed in the use of the radio-paging and call-back system. Although the EOC is normally activated at the "Alert" stage, some staff members arrived during the "Unusual Event" stage. The call declaring the "Unusual Event" was received from the Vermont Yankee plant at 6:03 a.m. and was verified at 6:06 a.m. by the State Police warning point in Waterbury. Radio-paging of State officials and EOC staff took place from 6:08 a.m. through 6:12 a.m. In three cases, individuals could not be reached by the radio-pagers, either because they had their pagers turned off or because the pagers malfunctioned. These three individuals were notified by commercial phone. This was completed by 6:28 a.m. By this time, all other staff members had phoned in to receive the message indicating the Unusual Event.

Another problem developed when the Governor tried to call back in to the EOC radio operator after being paged and could not get through. This problem was quickly identified and remedied by the EOC staff, who switched incoming calls back to the master telephone console rather than the auto-dialer, which did not have call-stacking capability. At 8:26 a.m., the warning point received the call from the Vermont Yankee plant notifying it of the escalation of "Alert" status. At 8:28 a.m., the radio-paging was again initiated to notify staff members to mobilize to the EOC. At 8:31 a.m. the radio dispatcher notified the incident director in the EOC of the escalation to Alert Status. The EOC was considered operational at about 8:40 a.m. and was fully staffed at about 9:30 a.m. (with the exception of the meteorologist, who arrived at 9:50 a.m.).

Staffing at the Vermont State EOC included representatives from the following organizations or agencies: the Governor's Office, Civil Defense, Public Service Department, Vermont National Guard, Human Services, American Red Cross, Amateur Radio Emergency Services (ARES), Public Information, Transportation Department, Vermont State Police, Health Department, Agriculture Department, Fish and Game Department, and Civil Air Patrol. The EOC staff competently performed its assignments and displayed adequate training and knowledge of their responsibilities.

Communications at the Vermont State EOC were improved over the previous exercises. The State EOC had good primary and backup communications systems. The radio telephone linking the State EOC with the local EOCs worked consistently well, thus correcting a previous deficiency (#3). However, it was observed that the Guilford EOC was not able to transmit over this system, although it could receive the messages. State EOC personnel adequately handled this problem by verifying message reception by Guilford by use of the backup land-line telephone.

Although the WESCOM microwave telephone linking Vermont, New Hampshire, Massachusetts, and the utility (plant site and EOF) worked well, the Vermont State EOC staff and Incident Director were continuously disadvantaged by the lack of direct formal communications from the utility. The Vermont State plan stipulates that the utility will notify State warning points of changes in plant status by means of the Nuclear Alert System (WESCOM SS-4A). This procedure was followed for the Unusual Event and the Alert emergency classification levels (ECLs); however, it was not followed for the Site Area Emergency and the General Emergency ECLs. At the escalation to Site Area Emergency, the utility notified the Vermont State EOC by means of commercial telephone at 9:23 a.m. Although commercial telephone is an acceptable backup system when the primary system is not operable, a delay resulted because the Incident Director at the EOC had to have the message verified by a call-back to the utility (9:25 a.m.). For the escalation to General Emergency, the Nuclear Alert System also was not used by the utility to notify Vermont. The information was received indirectly via the Vermont representatives at the EOF at about 10:00 a.m. Escalation to General Emergency ECL was confirmed at 10:10 a.m. by a call to the EOF by the Vermont Incident Director.

Other communication systems at the Vermont State EOC consisted of: dedicated SS-4 telephone line to the EOF; Civil Defense radio; Transportation Department radio; State Police radio; and National Warning System (NAWAS). Additional radio support was also available from ARES (Amateur Radio Emergency Services) and the Civil Air Patrol (CAP). Tri-state coordination with New Hampshire and Massachusetts was observed to

be adequate, thereby correcting a previous deficiency (#67). The equipment and procedures are both available to allow Vermont to coordinate with the other two states.

Management of emergency operations at the Vermont State EOC was good. The Governor was present at the EOC for the entire exercise and was the primary decision maker. She consulted with appropriate officials in reaching decisions and questioned others to more clearly understand the situation and the effect it would have on the residents in the area. The Incident Director (Director of Emergency Management) was delegated by the Governor with the responsibility for managing EOC operations. The Incident Director was knowledgeable of his responsibilities and performed them in a thorough and professional manner. At key times during the exercise, he conducted briefings of all the EOC staff to update them on plant status, protective actions, or other key events or decisions. Message handling at the EOC was generally good. Messages were recorded on a preprinted form and channeled to a message controller, who made copies and distributed them to all appropriate staff members. However, it would be helpful for the message controller to assign a specific number to each message in order to ensure an accurate inventory of all messages.

Although overall management of the EOC was good, some opportunities for improvement were observed. Because of the recent change in administration, some of the EOC staff members were inexperienced in radiological emergency-preparedness exercises. As a result, some of the decision making was carried out in a strained atmosphere, and some delays resulted when the Governor and other members of her office requested detailed information prior to approving a course of action. For example, the precautionary evacuation decision was delayed while the decision makers tried to determine which areas to evacuate. Determining the wording of protective action messages also caused delays, since prescripted messages were not used. Nevertheless, the attitude displayed by all key EOC staff during the exercise was positive and helped make it a constructive experience. Because of this, it is expected that informed decision making will be expedited in future exercises.

The dose projection function was performed at the EOF. Personnel at the EOC had the capability to make these projections using a programmable calculator. Information on plant status and dose projections were relayed to the EOC by either the radiological health liaison or the Public Service nuclear engineer. This information was relayed via commercial telephone to the respective operations desks in the EOC. There was a complete lack of weather forecast information, and "real-time" meteorological data, wind speed, and wind direction, etc., often was available only after considerable delays. This inhibited understanding of movement of the plume.

The radiological health personnel formulated a protective action recommendation for sheltering out to 2 miles, 5 miles downwind, and 10 miles for dairy animals at the first indication of a release. This recommendation was reviewed by the Commissioner of Health and passed to the Governor, who implemented the protective action recommendation in a timely manner. Because the wind at this time was directed into New Hampshire, this recommendation was precautionary for Vermont. Later in the exercise, when there was a potential for a second release, the radiological health personnel and the Commissioner of Health formulated a second protective action recommendation for a general evacuation of Vernon and for selective evacuation (children and pregnant women)

for Brattleboro. This recommendation was finally adopted after being discussed at great length by the Governor and her advisors because of the lack of definitive plant-status information. The Nuclear Regulatory Commission, upon being consulted, supported the recommendation, which, again, was precautionary and based on the potential of a release.

Even though the Vermont field-monitoring team had been predeployed prior to the exercise, the EOC was unable to contact these teams until well after Site Area Emergency. Plume definition and tracking in the EOC was based solely on projection data obtained from the EOF. Essentially, no field-monitoring data were available in the EOC. This is at least partly the result of Vermont's policy to not allow their emergency workers to receive any exposure to radiation above background levels.

The Vermont State EOC effectively demonstrated its ability to alert the public and issue an instructional message in a timely manner. This was done in conjunction with the escalation to Site Area Emergency. At 9:25 a.m., the call from the utility notifying the State EOC of the escalation to Site Area Emergency was verified. Verification was required since the call from the utility came by commercial telephone. At 9:41 a.m., the State decided to issue a sheltering recommendation. State representatives wanted to have the EBS message aired before 10:00 a.m., but the radio station would not air it until 10:05 a.m. At 10:00 a.m., NOAA tone-alert radios were activated. At 10:05 a.m., the Governor read a prepared test EBS message. Although detailed instructions to the public were not included in this message, it did demonstrate the coordination required to air a message in a timely manner. Prior to this EBS test message, the local EOCs were notified of the sheltering recommendation at 10:02 a.m. Subsequent EBS messages were only simulated. For example, at 11:40 a.m. the state decided to issue a selective evacuation message. At 11:45 a.m., the EOC notified the Brattleboro and Vernon EOCs of the evacuation recommendations, which were to be effective at 12:15 p.m.; the EOC staff indicated that this recommendation would have been given to the public via an EBS message at 12:15 p.m.

In both cases involving protective action recommendations, the State EOC notified Brattleboro and other local EOCs prior to the actual or simulated release of the EBS messages. This corrects a previous deficiency (#87).

Protective action supporting activities (e.g., the establishment of access control and traffic control points and activation of the reception center), took place during the exercise. These activities were coordinated by EOC staff. The detailed descriptions of these activities are provided in Sections 2.1.3, 2.1.5, and 2.1.6.

Several press briefings were held by the Governor and her spokesman in the EOC building during the exercise. Since these briefings were not scheduled or announced, none of the briefings were observed by federal observers. Most exercise press briefings were held at the official Media Center at Dalem's Chalet.

Recovery and reentry was not an objective of this exercise. However, at the de-escalation of the exercise, the state demonstrated its appreciation for problems associated with safe reentry. The State of Vermont conferred on the WESCOM phone with New Hampshire and Massachusetts to coordinate decision making on de-escalating

and recovery/reentry. At 2:30 p.m., the three states agreed to de-escalate but not to cancel the evacuation order. At 2:38 p.m., the states agreed to reenter after the radiological health data were reviewed and indicated readings within limits. The Governor was advised of this, and at 2:43 p.m., a message was transmitted to the local EOCs indicating that due to the improved situation at the plant and "safe entry levels", the emergency status was being de-escalated to the Alert condition and the evacuation order was being lifted. The message further advised that the citizens could reenter the area and return to their homes.

In general, the scenario was adequate to evaluate the capabilities of the State of Vermont at the EOC relative to the exercise objectives.

Deficiencies and Recommendations

1. **Description:** Decision making at the EOC was sometimes delayed due to the relative inexperience of some EOC staff members in radiological emergency-preparedness exercises. Because of this, the complex interaction of staff members required for decision making was not always efficient (FEMA-REP-1, Rev. 1, II, O.1, O.5).

   Recommendation: EOC staff and decision makers should participate in future training drills and exercises to improve the efficiency of decision making.

2. **Description:** Some difficulty was observed in formulating protective action messages, which resulted in delays in getting these messages to the local EOCs (FEMA-REP-1, Rev. 1, II, E.7).

   Recommendation: Prescripted messages should be used whenever possible to eliminate delays caused by deciding on wording of messages.

3. **Description:** Even though the field monitoring teams performed their duties as prescribed in the Vermont State plan, the low dose limits preclude the identification of the plume boundary and field verification of dose projections. Furthermore, the RAC believes that the low allowable dose limits renders the Vermont field-monitoring teams incapable of providing accurate field verification. Thus, Vermont would be dependent on utility field-monitoring data and would not be able to verify the dose projections independently (FEMA-REP-1, REV. 1, II, I.9, I.11).

   Recommendation: It is suggested that Vermont make better arrangements to locate and track the airborne radioactive plume. This may include changing state guidelines and field procedures to allow for the entry of field-monitoring teams into areas suspected

to be in the plume. This could be done without exceeding EPA exposure limits and would allow the state to obtain radiation measurements.

Areas for Improvement and Recommendations

1. **Description:** During EOC staff activation, three people could not be contacted with the radio pagers, since they either had their pagers turned off or the pagers were inoperative (FEMA-REP-1, REV. 1, II, F.1.e).

   Recommendation: The radio-pagers should be checked to ensure they are in working order and the procedures reviewed to ensure that the radio-pagers are not turned off.

2. **Description:** During the notification of EOC staff prior to EOC activation, the Governor temporarily could not get through to the radio operator at the State Police warning point to receive the message. This was due to one of the radio operators transferring incoming telephone calls to a supplementary auto dialer console that did not have call-stacking capabilities (FEMA-REP-1, REV. 1, II, F.1.e).

   Recommendation: Procedures should be reviewed and expanded, if necessary, to ensure that staff members calling in for their message are able to be connected to the radio operator in a timely manner.

3. **Description:** Facilities at the Vermont State EOC are generally good with the exception that the Operations Room is relatively small. During the exercise, the staff tended to congregate in the Operations Room, which became overcrowded. The number of people standing around in the room also blocked most of the maps and displays, reducing their usefulness (FEMA-REP-1, REV. 1, II, H.3).

   Recommendation: An attempt should be made to see if access to the Operations Room can be controlled without reducing the effectiveness of required personnel interaction.

4. **Description:** Maps and displays at the Vermont State EOC were generally adequate, with the exception that one of the status boards was not kept fully updated (FEMA-REP-1, REV. 1, II, H.3).

   Recommendation: All information shown on status boards should be updated in a timely manner to avoid misinterpretation of plant status and other actions and events.

5. **Description:** Other than time of message, no identification numbers were assigned to written messages on the message forms (FEMA-REP-1, REV. 1, II, F.1).

Recommendation: An identification number should be assigned to each message by the message controller prior to copying and distribution.

2.1.2 Vermont State Laboratory

The Vermont radiological laboratory is a small facility that contains the counting equipment listed in the plan. One piece of equipment, the liquid scintillation counter, was not operational and had not been for some time. While the laboratory may be adequate for routine environmental monitoring, the facilities are marginal for use in the event of a significant incident at the Vermont Yankee Nuclear Power Station. Additional hood capacity would be needed. Waste handling should also be upgraded. A GM ratemaker was available to screen incoming samples for the presence of elevated levels of radioactivity. The State has agreements with the University of Vermont and the New England compact states for backup counting assistance if needed.

Based on an interview with the lab operator, additional training is needed to assure an adequate response to a nuclear power-station incident. The operator presented a listing of radionuclides that was used in the automated gamma spectrum analysis. The listing presented is not adequate for the analysis of emergency samples. In subsequent interviews with other radiological health personnel, it was stated that the listing presented was not correct and that in fact a more complete, and current, radionuclide list is available. At a minimum, the lab operator requires additional training. The sample logging procedures are probably adequate for routine samples; a large number of emergency samples from widely scattered sampling locations could be a problem. Additional training also is needed to assure that samples containing elevated levels of radioactivity (above some preselected level) are not admitted to the laboratory. The lab operator was not aware of what this level would be.

Deficiencies and Recommendations

1. **Description:** The State Laboratory is not adequately equipped to handle the number of samples and radioactive waste resulting from a significant incident at the Vermont Yankee Nuclear Power Station (FEMA-REP-1, REV. 1, H.12, L.8).

   Recommendation: Upgrade the facilities at the state laboratory, including: (1) additional hood capacity and (2) improved waste handling.

2. **Description:** The laboratory personnel were not adequately prepared to handle the kind and number of samples resulting from a significant incident at the Vermont Yankee Nuclear Power Station (FEMA-REP-1, REV. 1, II, O.4.c).

   Recommendation: Provide additional training and new record-keeping procedures for the State Laboratory personnel.

2.1.3 Incident Field Office (IFO)

For this exercise the emergency response capabilities of the IFO in Brattleboro were demonstrated.

Activation of the IFO was initiated by a call at 8:48 a.m. from the Incident Director at the State EOC in Waterbury at the "Alert" ECL. Activation and staffing of the IFO was generally adequate, although not all agencies participated. Only the activation and staffing of the Agency of Transportation was fully observed. Its staff notification was good, with the exception that an inaccuracy in the call list was observed. Although not fully observed, no problems were apparent in the staffing of the other agencies that participated in the exercise. Although the staff representatives at the IFO were knowledgeable in terms of their normal agency missions, they were not intimately familiar with emergency-management-plan concepts. The staff members demonstrated professionalism in carrying out their assignments and were willing to consider procedures that could increase the effectiveness of IFO operations.

No effective centralized management and control of the operations and activities at the IFO were observed during the exercise. There was no effective emergency-management structure operating in the IFO. Each agency that participated operated with little or no interaction with other agencies to implement local protective actions. Communication of critical information into and within the IFO was inadequate as a result of the lack of an effective central operations manager.

The IFO is located at the Agency of Transportation District 2 facility on Route 5 in Brattleboro. As noted as a deficiency (#16) in previous exercises, the IFO in Brattleboro would be inadequate to handle actual emergency operations. This remains as an uncorrected deficiency. This facility is currently located within the 10-mile plume exposure EPZ. The facility should be relocated at a greater distance from the plant or hardened to provide habitability in the event that protective actions become necessary. The Health Department is presently located in the basement of the IFO and is physically separated from the other agency representatives at the facility. It is suggested that the Health Department representatives be physically located with the other agencies. Moreover, the current floor plan, with physical barriers separating agencies, inhibits effective communications.

The primary communications systems available to most agencies represented at the IFO were radios supplemented by land lines. The State Police and Civil Defense radios were in place, as was the Agency of Transportation radio phone. Dedicated lines to Civil Defense and land lines served as multiple backup to all agencies. The Emergency Medical Service, National Guard, and Sheriff brought portable radios. In addition, an intercom was utilized to connect the Health Department, which was in the basement, with the other participating agencies. The quality of the communications transmissions at the IFO was clear, and the various systems operated effectively. Improvements in the internal communications equipment corrected a previously reported deficiency (#88).

The IFO has no responsibility for dose assessment but is involved with field monitoring. Two field teams were dispatched from the Brattleboro IFO. Field readings were reported regularly and communication was good, although the teams spoke directly

to the State EOC instead of the IFO, which was not according to plan. The teams were not adequately equipped or trained. These problems are further described in Section 2.1.4.

The IFO has no responsibility for public alerting and instruction. However, vehicles and equipment available at the IFO could be used to assist on this function if necessary.

The IFO staff demonstrated its ability to implement procedures for traffic control and transportation. Traffic control points were promptly ordered and staffed. This activity involved the Highway Department, State Police, and County Sheriff. Crew assignments had been developed for each location and were identified on a map. Information on the crews and the traffic control points was readily available to each of the participating agencies. Two of the traffic control points were observed during the exercise (Control Points #5 and #3/3A). Both control points were staffed by Agency of Transportation personnel. Control Point #5 is located at exit #5 on Interstate Highway I-91 and was staffed by a Vermont Agency of Transportation employee and truck. The observation took place at 10:55 a.m. The agency employee was familiar with his traffic control assignment but was unaware of procedures for worker exposure control and had not been issued radiological measuring instruments. He had communications capabilities with his agency and with the Vermont State Police dispatcher. Control Point #3/3A is located at exit #3 on Interstate Highway I-91 and was also staffed by a Vermont Agency of Transportation employee. This individual had been issued protective rain gear and dosimeters and was familiar with his traffic control responsibilities. Neither of the individuals who staffed the traffic control points were aware of the locations of reception/congregate care centers.

Efficient and timely implementation of protective action was inhibited by lack of participation and coordination among the IFO agencies. A potential problem may exist in the timing and dispatching of evacuation buses that may be sent into the local area. IFO staff arranged for a bus staging area but were unclear on route assignments for the buses or the agency contact for ordering the beginning of the routes. In addition, while the transportation staff was involved in planning for evacuation by bus, the police, sheriff, and National Guard were completely aware of this effort. All relevant agencies should be involved in these major decisions.

Radiological exposure control for IFO workers and emergency workers dispatched from the IFO was inadequate. Agency personnel were unaware of appropriate procedures for issuing and using dosimeters. There was no overall control of dosimeter issuance and record keeping. IFO personnel were unfamiliar with good exposure control policies and practices. Dosimeters were not issued to emergency personnel until the "General Emergency," even though the IFO is only 5 to 6 miles from the plant site. IFO personnel stated that they would not issue dosimetry equipment to emergency workers in the field until a release had occurred. In many instances, this would be too late and an inefficient use of personnel needed elsewhere in a "General Emergency." Additional training of emergency personnel in radiological exposure control equipment and procedures is required.

There was no media activity at the IFO, and no press briefings were conducted from that location.

The scenario was adequate for exercising the emergency response capabilities of the IFO, although there were periods of inactivity. The kinds of problems that the staff was required to solve were suited to the identification of both strong and weak aspects of the organization. The staff participated in evacuation activities of the immediate area. However, the scenario did not provide for discussion of the logistics of recovery and reentry of the evacuated areas.

Deficiencies and Recommendations

1. **Description:** No effective centralized management and integrated control of the operations and activities at the Vermont IFO (Brattleboro) were evident during the exercise (FEMA-REP-1, REV. 1, II, A.1.b; A.1.d).

   Recommendation: The organizational responsibilities and staff assignments at the IFO should be reviewed and modifications implemented, if necessary, in order to ensure the effectiveness of integrated management and control at the facility.

2. **Description:** The Vermont IFO in Brattleboro is inadequate to handle actual emergency operations, since the facility is within the 10-mile EPZ and is presently unhardened. This would require evacuation in the event that protective actions became necessary (FEMA-REP-1, REV. 1, II, H.3).

   Recommendation: The IFO should either be relocated at a greater distance from the plant or hardened to provide habitability in the event of an actual radiological emergency.

3. **Description:** One of the Vermont Agency of Transportation employees was unaware of procedures for radiological exposure control and had not been issued any radiological measuring instruments (FEMA-REP-1, REV. 1, II, K.3.a; K.3.b).

   Recommendation: All emergency workers assigned to duties in the EPZ should be trained in proper radiological exposure control techniques and should be issued proper dosimetry equipment as appropriate.

4. **Description:** Although Vermont IFO staff arranged for evacuation buses and a staging area for the buses, staff members were unclear on bus route assignments and an agency contact for ordering the commencement of bus evacuation (FEMA-REP-1, REV. 1 II, A.1.b; J.10.g; O.1).

   Recommendation: Additional training of IFO staff involved in the coordination of bus evacuation is required to ensure that they are

familiar with bus route assignments and with the individual who authorizes the dispatching of the buses for evacuation.

5. **Description:** Radiological exposure control for Vermont IFO workers and emergency workers dispatched from the IFO was inadequate, including knowledge of proper procedures and issuance and use of dosimeters (FEMA-REP-1, REV. 1, II, K.3.a; K.3.b; O.1). **Recommendation:** Additional training of IFO emergency personnel in radiological exposure control equipment and procedures is required.

Areas for Improvement

1. **Description:** An inaccuracy in the call list of the Agency of Transportation was observed (FEMA-REP-1, REV. 1, II, E.2).

   Recommendation: The call list used for notifying emergency personnel should be periodically reviewed and updated to ensure its accuracy.

2. **Description:** The Health Department representatives at the Vermont IFO in Brattleboro are situated in the basement of the IFO building and are physically separated from other agency representatives and decision makers, who are located on the first floor (FEMA-REP-1, REV. 1, II, H.3; A.1.b).

   Recommendation: It is suggested that the Health Department representatives be relocated up to the first floor in order to expedite more effective interaction with other agency representatives.

3. **Description:** Neither of the Vermont Agency of Transportation employees who staffed the two traffic control points observed during the exercise were aware of the locations of reception/congregate care centers (FEMA-REP-1, REV. 1, II, J.10.h; O.1).

   Recommendation: Emergency workers assigned to traffic control points should be trained to know locations of emergency facilities, such as reception centers, congregate care centers, and decontamination facilities.

2.1.4 Vermont Field Monitoring

Two radiological monitoring teams, consisting of two members per team, were sent out into the field from the Brattleboro IFO in Vermont. Mobilization procedures were not demonstrated; team members were prepositioned for this exercise. An adequate mobilization system that includes the use of radio-pagers, call lists, and procedures to replace unreachable members was described in detail.

The field monitoring teams brought their monitoring equipment with them from Waterbury. The teams should check equipment prior to departure from Waterbury to ensure that all necessary equipment is in the kit and is operational. The dosimeters at the IFO were zeroed prior to the arrival of the field teams so that there would be no delay in dispatching the teams to their sampling locations. Handheld survey instruments were checked prior to departure from the IFO and were left on. Communications were checked while enroute to the monitoring locations which were found quickly. However, Vermont does not use a numbering system such as the one described in FEMA-REP-1, Rev. 1, II, J.10.a.

The teams had adequate equipment for exposure monitoring, including high- and low-range G-M detectors, portable NaI detectors, and thin-end window G-M counters. However, key components, such as the single channel analyzer and air pump for iodine monitoring, could only be run on internal battery power, providing less than adequate reliability, and only one team had instrumentation for detecting radioiodine in the field. Furthermore, the air sampling pump had no adapter for attaching charcoal filters, nor did the team know what silver zeolite was or if they would use it in an emergency. They did not have any instrumentation to count the air samples in the field, and it is uncertain if a 10-liter sample would be sufficient to detect levels of 10^{-7} microcuries per cubic centimeter. The Ludlum 2218 SCA instruments was defective in that its LED readout remained totally blank, a critical problem for the field team. Some of the instruments did not show a calibration date.

The teams did have adequate equipment for taking milk and water samples; however, they did not have a shovel or scoop for taking soil samples.

There were some weak areas in the technical operations, indicating a need for more frequent training to maintain a higher degree of familiarity with the radiological survey equipment. There was, for example, uncertainty as to what kind of information the instrument was providing (i.e., dose equivalent rate, exposure rate, or cpm), failure to take along the set-up procedure for the iodine monitor, and failure to take ground-level measurements with the G-M Counter.

Radio communications were maintained with the State EOC throughout the exercise in spite of the fact that the plan indicates that the field teams communicate through the IFO. However, because the communication worked so well, it is recommended that the plan be modified to bypass the IFO.

Dosimetry was generally adequate. Team members all had sufficient self-reading dosimeters, which were zeroed before going into the field and were read every 20-30 minutes. However, only one team member on each team had a permanent record badge, which is not sufficient. The teams had supplies of KI and knew when to use it.

Deficiencies and Recommendations

1. **Description:** The field teams lacked familiarity with the instrumentation (FEMA-REP-1, REV. 1, II, I.8).

   Recommendation: Provide the field teams with more training in how to use their equipment and a better understanding of what they will be looking for in the field (i.e., noble gases and iodine, not alpha radiation).

2. **Description:** The monitoring surveys were incomplete; only closed window readings were done (FEMA-REP-1, REV. 1, II, I.8).

   Recommendation: Surveys should include open and closed window readings and measurements at ground and waist levels.

3. **Description:** The teams did not have the capability for measuring radioiodine in the field (FEMA-REP-1, REV. 1, II, H.7; I.9).

   Recommendation: Verify if air sample pumps and current procedure will allow detection of 10^{-7} microcuries per cubic centimeter, or consider using a higher volume pump, silver zeolite cartridges (in an actual emergency only), and counting using a pancake probe. In addition, the procedure must be modified to instruct teams to leave the plume to count the samples.

4. **Description:** Not all team members had permanent record dosimeters (FEMA-REP-1, REV. 1, II, K.3.a).

   Recommendation: Provide all field-monitoring team members with permanent record dosimeters.

5. **Description:** Vermont does not have a numbering system for its field-monitoring points (FEMA-REP-1, REV. 1, II, J.10.a).

   Recommendation: Develop a numbering system for the field-monitoring points.

6. **Description:** Radio communications were from the field teams to the State EOC instead of the IFO, a procedure not in accordance with the plan (FEMA-REP-1, REV. 1 II, F.1.d).

   Recommendation: Because this worked well, it is recommended that the plan be modified to bypass the IFO.

2.1.5 Bellows Falls Relocation Center

The relocation center at Bellows Falls High School was activated for the exercise. The relocation center consisted of three functional areas: reception center, radiological monitoring and decontamination, and mass care. The center was quickly and efficiently activated after a call from the EOC to the Vermont State Agency for Human Services representative (Reception Center Director) at 8:50 a.m. The Agency for Human Services representative arrived to activate the facility at 9:25 a.m.

The Agency for Human Services is responsible for coordinating the reception center. The only other agency represented at the reception center during the exercise was the Department of Mental Health. The Reception Center Director was notified of the number of evacuees to expect by her liaison at the State EOC. Several minor problems were observed. There was some confusion about registration forms. The Red Cross has a separate form for registering people coming into the mass care area; however, the State should have its own registration form to indicate who has checked into the reception center and where checked-in persons are going. The Reception Center Director and her staff performed their duties well and interacted well with the mass care and radiological monitoring/decontamination areas. Directions to evacuees could be improved. Additional, larger signs would be helpful in directing evacuees to proper locations in order to insure that clean areas do not become contaminated.

Relative to financial assistance, the present plan to provide assistance to those evacuees who meet welfare criteria does not consider the needs of those evacuees who are only temporarily in need of funds due to inaccessibility of their own funds.

There was some initial confusion on where the radiological monitoring and decontamination were to take place. The Reception Center Director thought it was to take place at the St. Johnsbury Trucking Company facility, contrary to the understanding of the public health workers who were to perform the monitoring and decontamination. After some discussion it was decided to perform the functions in the same building as the reception and mass care activities. This required roping off areas to ensure that unmonitored people did not enter the reception area. An identification tag was used to identify people who had been processed through the monitoring and decontamination station. However, the workers were not familiar with all of the information printed on the tag. In addition, there was uncertainty as to who would provide clothing to victims if they had to discard contaminated clothing.

Radiological monitoring of evacuees was performed by four State public health workers using Model CDV-777-1 monitoring equipment and dosimeters. Ten (10) monitoring instruments were available for use. Decontamination would be performed in a bank of 8 shower stalls adjacent to the monitoring room. The monitoring/decontamination function was managed by a Vermont Public Health Department nurse. She and her team of workers performed their responsibilities in a professional manner.

The mass care function was performed at the facility by members of the American Red Cross. The shelter manager was officially notified to activate the facility by a call from the State EOC at 10:16 a.m. The mass care center can accommodate up to 800 persons. There are designated areas in the facility for the shelter manager, health

services, registration, supplies storage, recreation, and food preparation. During the exercise only a pay telephone was available for communications; however, staff indicated that in a real emergency Red Cross radio and amateur radio would be available and positioned in the mass care shelter. There are adequate toilet and shower facilities available at the shelter. There is no emergency generator presently installed at the facility. Staffing capabilities would be sufficient to perform all duties at the shelter on a multiple-shift extended schedule. The Red Cross liaison at the district headquarters could also be contacted if additional staff or supplies were needed. The shelter manager would receive updated information on the status of the nuclear accident from the Relocation Center Coordinator at the State EOC. This information would be shared with evacuees by posting information on the status board or by verbal announcements.

Deficiencies and Recommendations

None.

Areas for Improvement and Recommendations

1. **Description:** There is no registration form for the State to use to register evacuees when they arrive at the Reception Center. Presently there is only a log sheet (FEMA-REP-1, REV. 1, II, J.12).

   Recommendation: It is recommended that the State develop its own registration form for evacuees at the Reception Center, regardless of whether the evacuees subsequently go to the Red Cross mass care center.

2. **Description:** An identification tag was used by State personnel in the monitoring/decontamination area. However, the workers were not familiar with all of the information printed on the identification tag (FEMA-REP-1, REV. 1, II, J.12).

   Recommendation: Emergency personnel should be instructed on the meaning of all information on the tags.

3. **Description:** Directional signs were too small and were insufficient in number to clearly direct evacuees (FEMA-REP-1, REV. 1, II, H.4; J.10.h; J.12).

   Recommendation: More and larger directional signs should be used at the relocation center to assist evacuees in determining the locations of registration and monitoring stations.

4. **Description:** There were some observed misunderstandings among relocation-center staff members as to where radiological monitoring and decontamination would be conducted (FEMA-REP-1, REV. 1, II, H.4; J.10.h; J.12).

Recommendation: The plans and procedures should be reviewed and, if necessary, updated to ensure that the location where radiological monitoring and decontamination activities are to be performed is established. Emergency workers should then be briefed to ensure that they are aware of the correct location.

5. **Description:** It was not clear among emergency workers at the Relocation Center as to which organization would provide clothing to victims if contaminated clothing had to be discarded (FEMA-REP-1, REV. 1, II, A.1.b; J.10.h; J.12).

   Recommendation: Plans and procedures should be reviewed and, if necessary, revised to clarify and identify which organization will be responsible for providing replacement clothing to victims. If a private agency (e.g., Salvation Army, Seventh Day Adventists, etc.) is identified, a written agreement should be prepared.

6. **Description:** The present plan to provide financial assistance to those evacuees who meet welfare criteria does not consider the needs of those evacuees who are only temporarily in need of funds due to their relocation (FEMA-REP-1, REV. 1, II, J.10.h).

   Recommendation: Plans and procedures should be reviewed, and if necessary, revised to ensure that the needs of those evacuees temporarily in need of funds (due to inaccessibility of their own funds) are met.

2.1.6 Vermont Local EOCs

2.1.6.1 Brattleboro

The Brattleboro EOC is of sufficient size and is adequately supplied to handle the needs of the EOC staff and to provide adequate space for media. Fans or other air-circulation devices should be provided, since the EOC became warm during the exercise. During periods of elevated radiation levels, doors could not be opened to allow air in for cooling and this would cause discomfort and hence lower work production by EOC staff. A status board was available and updated. Appropriate maps were posted, and the EOC staff also knew where in the EOC plan similar maps and pertinent information were contained.

The Brattleboro EOC was activated at the "Alert" stage by a call from the IFO at 8:36 a.m. Staffing was completed and the EOC was considered operational at 8:51 a.m. Activation of the Brattleboro EOC was extremely prompt, as most EOC staff work in the town offices located at or near the building within which the EOC is located. Round-the-clock staffing is available. Backup personnel were knowledgeable and well-trained as demonstrated by the EOC being staffed by a backup shift. This situation arose because many primary EOC staff were out of town. A well-rounded assemblage of personnel from various organizations was represented by the EOC staff members. The Brattleboro police learned of the "Unusual Event" declaration by a call from the Brattleboro Fire Department.

The EOC Director effectively managed operation at the Brattleboro EOC even though actual emergencies, such as a drinking water-contamination problem, arose. During these periods the assistant director had to assume an acting director role; and it was demonstrated that responsibilities could be readily handled by other personnel. Periodic briefings were not held, but close working relations of personnel ensured that all staff were aware of conditions. Plans (local and state) were available and referred to. Messages and telephone calls were logged, with adequate information on times, organization making the call, and dispatcher (or other staff) receiving the call.

Communications equipment and personnel operated very effectively. Trained fire personnel and police dispatchers handled communications. The primary radio-telephone systems temporarily broke down, but backup systems were readily used without delays in communication. This corrected two previous deficiencies (#4 and #92). Auxiliary communication systems were available (and used), such as EBS monitoring by a battery radio, scanners to monitor other emergencies, a second low band radio to directly talk with fire station, and CB capabilities. Considering the number of actual emergencies, such as fires, that were also being communicated, exceptional capabilities of both communication staff and communication equipment were demonstrated. The main communication systems were in an enclosed area of the EOC, which helped to keep extraneous noises from interfering with message reception. No hard-copy devices were available in the EOC; however, there is a hard-copy machine in police headquarters located within the same building. There appears to be some lack of proper communications by others (e.g., the IFO did not contact the EOC dispatcher every hour as required to ensure that the radio-phone was working). The dispatchers kept a glossary of

terms in front of them to ensure that messages were understood and that unfamiliar terms were properly spelled.

Dose assessment and preparation of protective action recommendations were not the responsibility of the Brattleboro EOC. Nevertheless, emergency personnel at the EOC should be able to evaluate accident-assessment information provided to them. However, it was observed during the exercise that emergency personnel at the Brattleboro EOC generally appeared unable to properly assess this information. This continues a previous deficiency (#25).

The Brattleboro EOCs role in public alerting was adequately performed in a timely manner according to plan. Through the EOC staff, vehicles with loudspeakers would be dispatched to inform those that may not have heard the sirens and/or EBS broadcasts. Actual testing of this alerting method has been adequate in the past but could not be done during this exercise due to cost constraints. Brattleboro's public instruction, limited to simulated activation of the EBS for sheltering and evacuation, did not include a message with detailed instructions to the public on who specifically should do the sheltering and evacuation.

In order to ensure that Brattleboro received prompt notification of a potential evacuation, the Brattleboro EOC requested the State EOC to advise Brattleboro prior to a public notification. This proved effective and was demonstrated when the Vermont State EOC notified Brattleboro of the evacuation recommendation at 11:45 a.m. but noted that the evacuation was not to be effective until 12:15 p.m. This corrects a previous deficiency (#93).

An adequate number (10) of key traffic control points would be staffed by police in time of an emergency, but this was not carried out during this exercise due to cost constraints. Resources are available from police, fire, and highway departments to keep evacuation routes clear and/or to establish alternative routes. The Brattleboro EOC plan contains updated lists of mobility-impaired citizens and lists of transportation companies that are to be contacted.

Adequate radiological exposure control procedures were not demonstrated in a consistent manner at the Brattleboro EOC during this exercise. Supplies of dosimeters and radiological survey meters were more than adequate for EOC staff and for other emergency workers that would be sent out. Dosimeters were issued to people occupying the corners of the EOC, but those having them apparently did not record levels on a regular basis. KI was not available, and personnel did not seem knowledgeable on the procedure for obtaining it from the health department and/or levels at which KI should be administered. No film badges or other permanent recorders were available. These are past deficiencies that have not been corrected (#26 and 94).

The exercise scenario was generally adequate to test the capabilities of the Brattleboro EOC.

Deficiencies and Recommendations

1. **Description:** Emergency personnel at the Brattleboro EOC generally were unable to properly assess accident assessment information (FEMA-REP-1, REV. 1, II, I.8, O.1).

   Recommendation: Additional training should be provided for Brattleboro EOC staff to enhance their ability to assess accident assessment information.

2. **Description:** The simulated EBS messages on sheltering and evacuation did not provide sufficiently detailed information on who specifically should shelter and evacuate (FEMA-REP-1, REV. 1, II, E.5, E.7).

   Recommendation: EBS message formulation should be improved so that it is clearly understood by the public who is to shelter and/or who is to evacuate.

3. **Description:** Radiological exposure control was weak at the Brattleboro EOC. The direct-read dosimeters were not read and recorded on a regular basis, and permanent record devices were not available (FEMA-REP-1, Rev.1, II, K.3.a., K.3.b., O.1).

   Recommendation: The Brattleboro EOC staff should receive additional training in radiological exposure control procedures and permanent record dosimetry should be provided.

Areas for Improvement and Recommendations

1. **Description:** The Brattleboro EOC became very warm during the exercise because of poor air circulation (FEMA-REP-1, REV. 1, II, H.3).

   Recommendation: Fans or other air-circulation equipment should be provided in the EOC.

2. **Description:** The IFO did not contact the Brattleboro EOC dispatcher every hour as required to ensure that the radio-telephone was working (FEMA-REP-1, REV. 1, II, F.1.b, F.3).

   Recommendation: Coordination with the IFO should be improved to ensure that radio-telephone contact is maintained each hour to test the system.

2.1.6.2 Dummerston

The Dummerston EOC is on the second floor of the town's Municipal Building. It is a large well-lighted room with sufficient furniture and equipment. A status board was clearly visible and kept up-to-date on significant events. The appropriate maps were displayed and clearly identified. Backup power is not available, nor is the EOC capable of extended operations, because there are no facilities for kitchen, bunks, or showers. However, the local Grange and church, which are directly across the street, could be used for these activities. Also, staff members live near by. The Emergency Director has requested cots from the Vermont Civil Defense Agency.

The Dummerston EOC was quickly activated and promptly staffed. The call initiating the activation of the EOC was received at 8:40 a.m. from the Southeast Mutual Aid. The EOC was operational at 8:55 a.m., although staffing was not completed until 10:05 a.m. Dummerston has a new Emergency Director, who assumed this office in July when the former director retired. The EOC staff members all knew their roles and performed their EOC functions smoothly and efficiently. Despite the fact this was a working day for the volunteer staff, only one member, the RADEF officer, was not present. He was on duty at the Vermont Yankee Nuclear Power Plant. His duties were carried out by the Assistant Civil Defense Chairman.

The town is capable of 24-hour staffing; this was demonstrated by presentation of a roster, which also was posted. The list was up-to-date and the numbers were correct.

The overall management of the Dummerston EOC by the new Emergency Director was very good. He was effectively in charge and utilized the functional capabilities of his staff efficiently. The staff promptly performed their assignments in accordance with the plan, to which they referred from time to time. Message handling was efficient, and logs were maintained by both the Director and Assistant Civil Defense Director. Periodic briefings were held to update the staff, and when appropriate the staff were involved in the decision making. Access to the EOC was controlled by the police.

The communication system of the EOC generally is adequate. The primary system is the radio-telephone. Commercial telephone is the backup system. The radio-telephone Civil Defense system network is linked with the local EOCs, State, utility, and other government offices. This system provides for conference calling when needed. However, the Emergency Director had problems with the radio-telephone receiver during the exercise and stated a technician had been out twice for repairs. This continues a previous deficiency (#95). The backup commercial telephone rings primarily downstairs in the Municipal Offices and is ignored by EOC workers as a result; the EOC needs its own line. All staff members have radio-pagers. The utility has provided isolated families (unable to hear the fire-house siren) with NOAA tone-alert weather radios. The EOC has a list of these persons. All the firefighters and police have pagers. The acquisition and use of these radio-pagers corrects an earlier deficiency (#21).

Dummerston EOC was not involved in Public Alerting and Instructions. These actions were initiated by the State EOC and the Southwest Mutual Aid.

Protective actions were not initiated at Dummerston as part of the exercise. However, the EOC staff and resources were available, should this have been necessary.

There are no nursing homes or institutionalized individuals in Dummerston. However, the Emergency Director and staff are aware of the few individuals who are handicapped and are prepared to provide them special consideration.

Although the Dummerston EOC has initiated a radiological exposure control program, the activities associated with radiological exposure control were not demonstrated at this exercise by the EOC. Therefore, a previous deficiency (#96) remains uncorrected. The RADEF officer, who is responsible for this program, was on duty at the Vermont Yankee Nuclear Power Plant and unavailable to participate. These duties were carried out by the Assistant Civil Defense Chairman. The EOC has a supply of high-range dosimeters, survey meters, and a dosimeter charger. The EOC Director is currently planning to provide additional radiological training for one staff member as backup to the RADEF officer.

The scenario involved the Dummerston EOC more fully in this exercise, thus correcting a previous deficiency (#27).

Deficiencies and Recommendations

1. **Description:** Periodic problems again were encountered with the radio-telephone communication system at the Dummerston EOC (FEMA-REP-1, Rev. 1, II, F.1.b; F.1.d).

   Recommendation: The radio-telephone equipment at the Dummerston EOC should be evaluated and either repaired or replaced with more dependable equipment.

2. **Description:** The Dummerston EOC did not fully demonstrate its capabilities to implement a radiological exposure control program (FEMA-REP-1, Rev. 1, II, K.3; K.4).

   Recommendation: The capabilities of Dummerston EOC relative to radiological exposure control should be fully tested in a future exercise.

Areas for Improvement and Recommendations

1. **Description:** The backup communication system (commercial telephone) for the EOC is primarily for the Municipal Offices, although it also rings in the EOC. However, EOC workers tend to ignore it when it rings because it is assumed it is for the Municipal Office (FEMA-REP-1, Rev. 1, II, F.1.b; F.1.d).

Recommendation: It is suggested that a new, separate telephone line be installed in the EOC.

2.1.6.3 Guilford

The Guilford EOC is located in the Volunteer Fire Department's station house. The facilities were more than adequate: ample space, furniture, and lighting; a large kitchen; and a large open area for cots or bunks. There was, however, only one commercial telephone. A second line would be useful. The status board was kept up to date and included posting of the emergency classification levels. Maps of the EPZ and town were clearly posted and included access control points, roads, houses, and locations of people requiring special assistance. Maps showing evacuation routes and relocation centers were not posted but were readily available. This corrected part of a previous deficiency (#29). However, since a copy of the plan was not available at the EOC, it could not be verified if decontamination centers are described in the plan, and this part of the previous deficiency (#29) remains uncorrected.

Activation and staffing of the Guilford EOC were performed in a timely manner. The call initiating the activation of the EOC was received from the Tri-State Mutual Aid at 8:44 a.m. after the declaration of "Alert." Commercial telephone was used to notify the EOC staff, with pagers also available for 10 members of the staff. The Fire Chief, who was notified by pager at the "Unusual Event" stage, was the first to arrive at the EOC. The Guilford Civil Defense Director was unable to participate due to job requirements, but his responsibilities were assumed by the Chairman of the Board of Selectmen. The entire staff performed smoothly and acted quickly and efficiently.

The EOC was managed quite effectively with all of the participants well informed and active in the decision making process. Messages were logged in and available to all participants. A copy of the town plan was not available at the EOC. (It was explained by the staff that the Civil Defense Director, who was not able to participate in the exercise, had an updated copy in his possession.)

The primary communication system at the Guilford EOC was a radio-telephone. This device worked poorly much of the exercise; thus, the commercial telephone was used as a backup, and all messages from the state were verified via commercial telephone. There were several other backup means of communication, including the town radio and fire department radio. Guilford has requested two mobile radios from the State, but they have not yet been procured. The malfunctioning of the radio-telephone primary communication system leaves previous deficiencies (#6, #28, and #97) uncorrected.

The Guilford EOC demonstrated its ability to play a role in alerting the public. This occurred at the time of the decision to shelter dairy animals. There are 10 dairy farms in the Guilford area, and it was decided to alert them by dispatching representatives in two automobiles. While this action was only simulated, the decision was timely, and it was estimated that it would take each automobile 15-20 minutes to complete the process. A previous deficiency (#98) regarding the clarification in the Guilford plan of the responsibility for public alerting via EBS messages could not be checked due to the lack of a copy of the plan at the EOC. In regard to the need for other special protective actions, the EOC staff indicated that there were adequate personnel and vehicles to control traffic in the area. The homes of those needing special assistance were clearly marked on a map, and their special problems were known to the EOC staff.

Dosimetry equipment was not available at the EOC, but according to the EOC staff the equipment was stored at the town office. The EOC staff had some knowledge of the use of dosimeters but need further training. According to EOC staff, there were no permanent record dosimeters available. The lack of dosimeters at the EOC and the lack of suitable training continues two previous deficiencies (#30 and #99).

Deficiencies and Recommendations

1. **Description:** A copy of the Guilford emergency plan was not available for reference at the EOC (FEMA-REP-1, Rev. 1, II, P.5).

   Recommendation: An up-to-date copy of the Guilford plan should be kept at the EOC for reference by EOC staff.

2. **Description:** At the Guilford EOC, the radio-telephone, which is the primary communication system, worked poorly during much of the exercise (FEMA-REP-1, Rev. 1, II, F.1.b; F.1.d).

   Recommendation: The radio-telephone equipment at the Guilford EOC should be evaluated and either repaired or replaced with more dependable equipment.

3. **Description:** The Guilford EOC did not fully demonstrate its capabilities to implement a radiological exposure control program. Dosimeters were not observed at the EOC, permanent record dosimeters were known by the staff not to be available, and EOC staff was not suitably trained in the use of dosimeters (FEMA-REP-1, Rev. 1, II, K.3, K.4, O.1).

   Recommendation: Dosimeters should be stored at the EOC facility, permanent record dosimeters should be procured, and emergency staff should be trained in radiological exposure control procedures.

Area for Improvement

Description: Only one commercial telephone line was available in the Guilford EOC.

Recommendation: Provide another telephone line to the EOC.

2.1.6.4 Vernon

The Vernon EOC is located in the basement of the town fire station. The EOC consists of two rooms, an operations room and a communications room. The facilities at the EOC are considered adequate. The EOC has sufficient space, furniture, heat, and lighting. A propane generator is available at the facility to provide backup power for the EOC. Bunks, showers, and a complete kitchen were all located in the firehouse building in which the EOC was located, making it suitable for extended around-the-clock operations.

The Vernon EOC staff members were prepositioned at the EOC; therefore, activation and staffing procedures could not be evaluated. The call formally initiating the activation of the EOC was received from Southwest Mutual Aid at the "Alert" ECL at 8:39 a.m. The EOC was fully staffed and considered operational at 8:50 a.m. Representatives from the following groups or organizations were present at the EOC: Selectmen, fire department, civil defense, radiological defense, police department, and public works. A communications officer and public information officer were also present. Round-the-clock staffing capabilities were demonstrated both by the presentation of a roster and by double-staffing at many positions. The EOC staff demonstrated adequate training and knowledge.

The Civil Defense Director was effectively in charge of operations at the Vernon EOC. He managed the activities and discussed situations with his staff before decision making. He also held briefings frequently during the exercise. However, some problems with emergency operations management at the Vernon EOC were observed. It was observed that the Director was personally involved with the incoming radio transmissions and preparation of message logs. Because he became so busy, it was difficult for the Director to handle his primary responsibility of decision making. Responsibility for receiving incoming radio messages and logging them in should be delegated to other staff members.

Another management problem observed was that there was some question by the EOC staff as to which decisions were to be made by the State and which were to be made locally. Additional training of the Vernon EOC management staff is needed relative to division of responsibilities between the State and local jurisdictions.

The radio-telephone communications system at the Vernon EOC worked well during the exercise, and no problems related to the communications equipment were observed. Commercial telephone was the backup system.

Dose assessment is not the responsibility of the Vernon EOC, and no dose assessments were performed there. The only involvement by the EOC staff in protective action decision making was the decision not to evacuate the Vernon EOC when the state recommended evacuation of the town.

There was some confusion regarding public alerting at the EOC. The sirens were not sounded as directed in the plan. The Director indicated at 10:02 a.m. that he would call EBS to have a message released. He later called the State EOC to determine if the sirens should be sounded. The state confirmed that the sirens should be sounded. Vernon

then simulated the sounding of the sirens, but this did not occur until 10:30 a.m., which was not timed properly with the EBS message. During the evacuation protective action the Vernon EOC played a role in public alerting by placing telephone calls to the nursing home and school and notifying them of the need for evacuation.

The EOC staff indicated that the Town of Vernon does not have sufficient police to control access immediately if an evacuation is ordered. The two police officers and cars on duty would not be able to man the four access control points. Assistance would have to be requested to man these posts. However, during the exercise the EOC staff were not observed to request this additional assistance.

Even though the State recommended that evacuees be sent to Bellows Falls, it was the opinion of the Vernon EOC staff that evacuees should be relocated to Greenfield, Massachusetts. The directions given to the school by the EOC called for evacuation to Greenfield rather than to Bellows Falls.

Radiological exposure control procedures at the Vernon EOC were somewhat weak. Dosimeters, a dosimeter charger, and record keeping cards were available, but these supplies were not issued and used. Permanent record dosimeters were not available, thereby continuing a previous deficiency (#100). The EOC staff were not knowledgeable about the proper procedures for the use of KI.

There was no media contact during the exercise at the EOC. The PIO knew that she was to refer anything other than local operations questions to the media center.

The scenario generally was adequate to test the emergency response capabilities of the Vernon EOC.

Deficiencies and Recommendations

1. **Description:** The Vernon EOC Director became too personally involved with the routine tasks of monitoring incoming radio transmissions and preparing message logs (FEMA-REP-1, Rev. 1, II, A.1.d).

   Recommendation: Routine tasks should be delegated to other EOC staff members in order to free the Director for the primary responsibility of decision making.

2. **Description:** The Vernon EOC staff were observed to be unsure of the division of responsibility in decision making between the State and the local EOC (FEMA-REP-1, Rev. 1, II, A.1.b).

   Recommendation: Additional training of the Vernon EOC decision making staff is needed in order to ensure that staff members are aware of which emergency decisions are to be made locally.

3. **Description:** The sounding of the sirens in Vernon was not coordinated with the EBS message (FEMA-REP-1, Rev. 1, II, E.5).

Recommendation: Procedures should be reviewed and expanded, if necessary, to ensure that sounding of the sirens and the EBS message are properly coordinated.

4. **Description:** The Vernon EOC staff indicated that Vernon resources were not sufficient to staff all traffic control points; however, no staff members were observed to contact the State to request assistance (FEMA-REP-1, Rev. 1, II, A.1.b; J.10.j).

   Recommendation: Improve coordination between the State and the Town of Vernon to ensure that all traffic control points are manned in a timely manner.

5. **Description:** During the evacuation the Vernon EOC recommended to the school that relocation be to Greenfield, Massachusetts, rather than to Bellows Falls, Vermont, as has been recommended by the State (FEMA-REP-1, Rev. 1, II, J.10.a; J.10.h).

   Recommendation: Procedures on relocation should be reviewed to ensure that evacuees are directed to the proper relocation center.

6. **Description:** Permanent record dosimeters were not available at the Vernon EOC (FEMA-REP-1, Rev. 1, II, K.3.a).

   Recommendation: A sufficient number of permanent record dosimeters should be procured for distribution to emergency workers at the Vernon EOC.

7. **Description:** The Vernon EOC staff were not knowledgeable about proper procedures for the use of KI (FEMA-REP-1, Rev. 1, II, J.10.e; J.10.f).

   Recommendation: The Vernon EOC staff should be trained in procedures for the proper use of KI.

Areas for Improvement and Recommendations

Description: Vernon EOC staff members were prepositioned at the EOC; therefore, the activation and staffing procedures could not be evaluated (FEMA-REP-1, Rev. 1, II, E.2).

Recommendation: Activation and staffing capabilities of the Vernon EOC should be tested in a future exercise.

2.2 NEW HAMPSHIRE STATE OPERATIONS

The State of New Hampshire activated and tested the State EOC in Concord, the Incident Field Office in Keene, three field-monitoring teams, the relocation center at the Keene State College, and five local EOCs for the towns of Chesterfield, Hinsdale, Richmond, Swanzey, and Winchester.

2.2.1 New Hampshire State EOC

The State's new EOC facility, located in the New Hampshire Civil Defense Agency Headquarters, State Office Park South, Concord, is much improved over the last one in several important respects.

There was substantially more room in the operations room, where most EOC staff worked. Each agency representative and civil defense functional area had a separate telephone. The communications room is adequate in size and equipment and is located physically near the operations room. This allows for quick message handling and noise control.

There were separate areas (rooms) for use by the Governor's representative and Civil Defense Director, DPH Accident Assessment, NRC and FEMA, and Public Information. There was a large meeting-room facility located on the floor above the EOC operational area for use by the press at media briefings.

All appropriate maps were either posted or available. The emergency classification levels were posted, and three status boards were available. One status board dealt with transportation needs, a second with evacuation and shelter-related matters, and the third with logging the status of key events during an emergency. This last status board was not kept current with key information. For instance, it was never noted that a release had occurred during the exercise. This problem relates to internal communications problems, which will be discussed later. It should be noted that $500,000 worth of major renovations to the State EOC are slated to begin this June. This should add significantly to the utility of the new State EOC.

The procedures for notifying and mobilizing State emergency response personnel were well demonstrated. The New Hampshire warning point received notification of the "Unusual Event" (declared at 6:11 a.m.) at approximately 6:20 a.m. The State EOC was activated and staffed by key response personnel prior to the arrival of the federal observers at approximately 8:00 a.m.

Notification of the "Alert" emergency classification level (ECL) was received via the Nuclear Alert System (NAS) telephone at approximately 8:40 a.m., about seven (7) minutes after it was declared by the utility. The notification of response agencies was begun promptly and was completed within 30 minutes. The State EOC was fully operational for communications, dose assessment, and decision making functions by approximately 8:55 a.m.

Notification of the "Site Area Emergency" ECL was received via the NAS telephone at approximately 9:25 a.m. All response agencies were notified, and the EOC was completely staffed by all agencies by approximately 9:45 a.m.

The New Hampshire State EOC liaison staff to the EOF was, as agreed to prior to the exercise, prepositioned in the vicinity of the facility in Vernon, Vermont. Emergency Operations management worked well. The Director of Civil Defense exercised a good command of his staff's activities and those of EOC personnel from other State agencies. Checklists and plans were extensively used. The Governor's representative maintained a frequent schedule of briefing the Governor, over the telephone, of the status on off-site activities. The Governor's representative also played a very active part in the incident management and decision making processes at the EOC. His knowledge of New Hampshire's off-site planning was impressive.

Message handling was much improved over that of the previous exercise. The Operations Officer, who is responsible for coordinating incoming and outgoing message flow, had an operations liaison who managed hard-copy message distribution.

Emergency communications at the New Hampshire State EOC were adequate. Notification of the "Unusual Event" was received at the warning point prior to activation of the State EOC. After notification of the "Site Area Emergency," the NAS telephone was transferred from the EOC operations room to the command and control center. Notification of the "General Emergency" was received at approximately 10:05 a.m. via dedicated telephone in the dose assessment room. However, this information never reached operations management. This information was later received via the NAS telephone in the command center at 10:17 a.m. The NAS telephone was operational throughout the exercise and was effectively utilized by the New Hampshire Civil Defense Director to coordinate actions with the Vermont and Massachusetts Directors.

The New Hampshire Civil Defense radio was operational throughout the exercise, but according to the communications coordinator, reception from Keene was "very poor." The CD radio system is used to maintain communications with the field-monitoring teams, and these communications were monitored by the operator in the communications center. It was evident that some difficulties were encountered with field-team communications with the IFO in Keene.

In addition to the NAS telephone and the New Hampshire CD radio system, there are a number of alternate links that can be relied upon for external communications with the State EOC. These systems are redundant and include State Police high band and low band (not operational for this exercise), Southwest Fire Mutual Aid radio, amateur 2-meter radio, NAWAS, and commercial telephone. As specified in the State plan, a direct telephone line links the accident-assessment function in the EOC with the New Hampshire representative at the EOF. This link was operational after the "Site Area Emergency" declaration for the receipt of technical (i.e., plant status and meteorological) data and integrated dose assessment information from the EOF.

Each agency representative at the EOC had a telephone for communicating with agency personnel outside the EOC. A centrex telephone system with six (6) 2-way lines and one (1) 800 line for incoming calls was used to serve approximately twenty-five (25)

telephones within the EOC. Although the available lines became intermittently overloaded at peak times, additional lines could be used in an actual emergency. This capability to open additional telephone capacity corrects a previous deficiency.

The mechanics of internal communications within the State EOC have been improved since the last exercise. Standardized message forms have been introduced, and agency representatives were familiar with the general use of these forms. The New Hampshire Civil Defense Agency is currently considering design of a standard State form, which is expected to further improve the coordination of information. In addition, internal communications within the EOC were aided by public-address-system briefings of the operations room staff. Emergency-classification information was prominently displayed in the operations room. In practice, however, internal communications still needs to be significantly improved at the EOC. Information flow between the DPH accident-assessment team and the emergency operations management and staff was a major problem in this exercise. Important information from the plant, relayed directly to DPH was not conveyed in a timely fashion to decision makers. Information about the starting and stopping of the release was relayed by DPH to the decision makers approximately 20 and 40 minutes respectively, after they knew about it. Similarly, DPH knew about the utility's declaration of a "General Emergency" about 15 minutes before conveying this information to EOC management. Furthermore, information flow between the CD Director/Governor's representative, who shared an office, and the main operations room was not good. Much important information was relayed directly from the DPH accident-assessment team to the CD Director/Governor's representative. However, much of this information never reached the operations room. The operations room staff were never told that there was a release, or that the release had been terminated. Consequently, this information was never reflected on the main status board, nor contained in any briefing to operations room personnel. A detailed discussion of the consequences of this follows in the protective action section.

The initial alerting of the public was accomplished via siren system and tone-alert radios (NOAA) at 10:00 a.m., followed by an EBS broadcast at 10:05 a.m. through Station WKNE. This radio station was alerted to remain on standby at 8:52 a.m., after the "Alert" was declared. The initial EBS message was drafted by the PIO, in consultation with the CD Director and Governor's representative. Before sounding the sirens and releasing an EBS message, the CD Director had the PIO inform the Media Center, and the CD Director informed his counterparts in Vermont and Massachusetts over the NAS telephone. One reason for the apparent delay, from 9:25 a.m. to 10:00 a.m., between "Site Area Emergency" and initial alerting of the public was that the control station in Vermont, which also activates tone-alert radios in New Hampshire, did not transmit its signal until 10:00 a.m.

Based on observer inquiries regarding siren verification and provisions to monitor EBS transmissions, a radio message was dispatched to the IFO at approximately 10:01 a.m. The reply received at approximately 10:20 a.m. confirmed siren activation at 10:08 a.m. The means of monitoring EBS messages at the State EOC was described as being via radio patch and commercial telephone to the EBS broadcast station. However, this was not demonstrated during the exercise.

Public alerting was simulated for a 10:45 a.m. siren tone-alert radio sounding and EBS message for the evacuation of Hinsdale and Chesterfield. As was done previously, this was fully coordinated in advance with the other two states' media centers and with the utility at 10:30 a.m.

New Hampshire's protective action decision to evacuate Hinsdale and Chesterfield was made with insufficient information. Between the time that the CD Director and Governor's representative, in consultation with DPH, had formulated its protective action decision (10:24 a.m.) and the time that the evacuation was to go into effect (10:45 a.m.), the basic factor generating the decision to evacuate changed. The release had stopped at 10:30 a.m., yet this was not told to the decision makers or the senior DPH representative briefing them until 10:48 a.m., three minutes after the evacuation order went into effect. The NRC representative relayed this information, not the DPH accident-assessment staff. It is very important to note, at this point, that the information flow from the DPH liaison at the EOF to the State EOC accident-assessment staff in Concord was timely, so there is no question that the information was in-house.

At a DPH briefing held for decision makers around 12:00 noon, it was learned for the first time that it had been raining off and on during the release and subsequent plume travel. The fact that two lightning strikes on the plant were reported by the utility, the second strike helping to generate the release, should have alerted DPH that rain and unstable weather conditions usually associated with a lightning storm were prevalent in the EPZ. At no time during the critical period when the release was occurring, and shortly after it terminated, was a weather forecast pertaining to the scenario requested. It should be noted, however, that this aspect of the exercise scenario was very poorly controlled by the utility. The utility had no control data developed for an accurate weather forecast, should one have been requested.

The reason for the lapse in rapid communication between the New Hampshire Department of Public Health and the decision makers in the State EOC (the Governor and the CD Director in this instance) is the method of communication involving several significant delays in transmitting information from one individual to another. Reporting of accident-assessment information to the command and control units must be expedited in order for them to make informed decisions about actions to protect the public health and safety.

In an attempt to resolve the previously recognized problem of slow transmission of accident data to the decision makers, the State Office of Civil Defense stationed its own personnel at the EOF. These individuals apparently were charged wtih keeping Civil Defense informed of all pertinent information originating at the EOF, however, no information flow from them to the EOC could be observed. It is clear that there is a great need to strengthen the link between Civil Defense and DPH in the protective action decisionmaking process.

At 11:43 a.m., NRC recommended a 2-mile general evacuation, 5 miles for children and pregnant women. This was precautionary regarding the consequences of a potential large release from a suspected hydrogen buildup. Based on this, New Hampshire decided to recommend that Winchester evacuate at 12:00 p.m. At 11:50 a.m., the NRC liaison indicated that he had mistakenly reported the previous recommendation,

and that it should have read just a 2-mile evacuation. Subsequently, the decision to evacuate Winchester was rescinded.

Evacuation of Hinsdale and Chesterfield was reported as completed around 12:30 p.m. The State EOC staff tracked the simulated evacuation of schools and nursing homes, and their transportation needs, throughout the evacuation. Also tracked was a troop of six boy scouts and a scout master in the Pisgah State Forest.

As part of New Hampshire's protective action decision to evacuate, two access control points were physically activated for this exercise, and three were simulated. The FEMA observer was able to physically observe one location; the other was not manned when he arrived. The state trooper observed was well aware of the duties of his assignment and had written procedures. However, he had no dosimetry equipment and was not familiar with the location of the reception center. At the State EOC, the state police liaison demonstrated his knowledge and ability to man numerous access and traffic control points.

Although media relations are to be handled primarily at the Joint Media Center, the State EOC has a facility to handle media inquiries concerning State activities.

Throughout this exercise, the State's PIO representative at the Media Center was not kept well informed of utility-generated press releases; consequently, neither was the State. It has been reported that, in several instances, the utility merely showed State (all three) representatives a copy of a news release right before releasing it. This is not in the spirit of sharing information before release. For example, a serious case involved an 11:50 a.m. hard-copy news release from the media center, received near 12:30 p.m., which mentioned that Vermont Yankee personnel had been evacuated from the site. This release occurred at a time when the State thought that all releases were finished and plant operations were being restored to stability. When the CD Director called the Media Center to clarify this information, it was learned that the news release should have read "...non-essential personnel...." In a real situation, an uncoordinated release of this sort could have been devastating to public confidence in the State.

The space assigned in the new State EOC for radiological health functions was somewhat crowded, but it was adequate for the players. Maps had been prepared for the Rad Health Assessment Operations and Governor's Consultation Rooms that showed the location of predesignated monitoring points, highways, population centers, dairy farms, water supplies, parks, etc. The direction of the plume could be changed and shown as an overlay of both the EPZ and ingestion pathway maps. A smaller version (8" x 11") of these maps was available for recording location of teams and readings for use in keeping the Governor's office advised. These smaller maps could be used for sketching the plume as it developed, progressed, or terminated from the New Hampshire areas of concern.

The State Radiological Health staff has made many improvements in its operational procedures for dose assessment and protective action recommendations. For example, standardized data sheets had been developed for recording data from the EOF and the DPH staff member(s) assigned to the EOF; these sheets had improved their ability to obtain and transmit essential data needed for dose assessment. In addition, the

form for recording and transmitting data to the IFO was standardized. However, accident assessment was slow after the data were received, because it was done using hand calculations.

Use of a computer terminal at the EOC to depict the shape and size of a plume as well as its movement would greatly improve the performance of the dose-assessment protective action function. Specifically, it would assist in the deployment of off-site monitoring teams. Such a terminal is planned for installation before the next exercise, and its use for developing control data was demonstrated during this exercise at the EOF.

The DPH coordinators at the IFO followed instructions for the deployment of the monitoring teams and relayed data to the State EOC regarding their location and the radiological situation by radio. Most of the time their reports could be monitored by the State EOC radio room, showing that the relay system was working successfully.

Communication with the EOF and the State Department of Health monitoring teams through the IFO was improved over the last exercise. However, it seems that the control data were released too late or not at all. For example, the EOF did not determine that iodine was released in the plume until after 11:00 a.m. Therefore, DPH briefed the decision makers at 10:30 a.m. that there was no iodine in the release. They further informed their IFO staff of the same. However, the data in the scenario indicated detectable levels of iodine in New Hampshire. Again, poor design of control data for field-monitoring teams by the utility contributed to this problem.

State officials had a one-hour discussion of reentry considerations to be put into effect following the de-escalation of the exercise accident. The DPH accident-assessment staff discussed what they understood to be the radiological consequences of the accident, and the State Veterinarian and agriculture representative discussed the need to put animals on stored feed in the affected area. Similarly, milk production was discussed for the affected area, with the recommendation being to cease milk production for at least 48 hours in the area to allow for State testing. An EBS message dealing with this, along with maintaining access control during reentry (only residents allowed in) was prepared at 2:30 p.m. However, due to the fact that the exercise was terminated shortly thereafter, around 2:50 p.m., the EBS message was never used.

The scenario was substantially flawed because important meteorological information in the form of a weather forecast regarding the expected shift in winds was not promptly provided to the participants. This, in combination with the quick-moving nature of the accident, put State decision makers at a considerable disadvantage.

Deficiencies and Recommendations

1. **Description:** There were significant lapses in internal communications between upper-level operations management and EOC operations staff. The most significant example of this is that the operations room staff was never informed that a release was in process, or that it had subsequently been terminated. This was also reflected in the status boards in the operations room, where

the release data were never recorded (FEMA-REP-1, Rev. 1, A.2.a; F.1.d).

Recommendation: Operations management should take positive steps to remedy the situation by stationing itself in the operations room and conducting most of its business there. By operating out of the office of the Governor's representative and moving the NAS phone into that office, operations management moved the most valuable communications link in this exercise away from the EOC staff. All information received in the EOC should be transferred to the Operations Officer as a matter of course, regardless of where it is initially received. Critical information should be immediately broadcast over the PA system to ensure its dispersal, thus cutting through possible administrative delays in hard-copy message handling. (In this case, however, hard-copy message handling was not the problem; it was hard-copy message generation.)

2. **Description:** Exchange of information among the Department of Public Health accident assessment staff and between representatives of the DPH management and Civil Defense operations management, did not result in rapid enough communication of accident assessment data from the plant and the field for the Governor to make appropriate protective action decisions. [FEMA-REP-1, Rev. 1, Planning Standard A (Organizational Control), Planning Standard F (Prompt Communications among Principle Response Organizations)]. (CATEGORY A DEFICIENCY).

   Recommendation: The Department of Public Health and Civil Defense management teams must be informed immediately of all changes in plant status, meteorological conditions, field monitoring data, and the implications of the data for protective action recommendations. Therefore, the plan procedures should be reviewed and changed, as necessary, so that the information flow will become more rapid and comprehensive. All staff connected with the emergency operations should then be trained to recognize the implications of key data, and in the new reporting procedures.

3. **Description:** Accident assessment was done with hand calculations and, therefore, was slow (FEMA-REP-1, Rev. 1, I.8).

   Recommendation: Provide the Department of Public Health with a computer terminal that can link up with the EOF's computer system to speed up accident assessment.

4. **Description:** The State has not yet procured a supply of KI to be stockpiled in Concord for use by emergency workers. (FEMA-REP-1, Rev. 1, II, J.10.e).

Recommendation: Purchase sufficient quantity of KI to meet the State's needs for its emergency workers.

Areas for Improvement and Recommendations

1. **Description:** Although the Civil Defense radio system remained operational and functioned better than in the last exercise, the State EOC experienced poor reception from Keene.

   Recommendation: Additional technical upgrading is still needed to improve the utility of this primary radio channel.

2. **Description:** Although the means of monitoring EBS messages at the State EOC was described, these provisions were not demonstrated during the exercise.

   Recommendation: The means for monitoring EBS messages by decision makers at the New Hampshire State EOC should be demonstrated at future exercises.

2.2.2 New Hampshire State Laboratory

The State Laboratory's capacity for analyzing and processing samples of food, water, crops, and milk would have been overwhelmed if substantial contamination had resulted from the plume. There is no spare equipment to backup the laboratory's capability in case of equipment failure. The laboratory has a capability to perform qualitative tests on environmental samples, but as yet it cannot obtain quantitative results. Additional training in this area is called for.

The laboratory has a Ge(Li) detector but no NaI(TI) system. The shield for the Ge(Li) needs a cover to reduce the background. This would improve the counting statistics considerably, and it would also improve the Minimum Detectable Activity (MDA) value. Laboratory personnel do not count samples overnight because of concern over operating the Ge(Li) after a power failure. This could be overcome if they became familiar with equipment available for resolving this problem. The laboratory director is starting a write-up of an SOP for an entire environmental surveillance program. He has written some things on the Ge(Li) and MCA; however, he does not have the background at this time on problems associated with the electronics of the system and the calculations involved in establishing a Minimum Detectable Activity. This MDA is further complicated because the Ge(Li) detector does not have an adequate shield to reduce the background count rate. State Laboratory staff should arrange to spend time at the Winchester Engineering and Analytical Center (WEAC) in Winchester, Massachusetts with the environmental surveillance group and the electronics section. This would assist the New Hampshire program to work towards establishing an SOP for a complete environmental surveillance program, including quantitative results and evaluation of electronics problems.

Deficiencies and Recommendations

1. **Description:** Laboratory staff need additional training in order to develop an SOP for a complete environmental surveillance program, which includes the ability to obtain quantitative results from sample analysis and proper techniques for dealing with equipment operation characteristics (FEMA-REP-1, Rev. 1, I.8).

   Recommendation: Arrange to have laboratory staff receive training at the Winchester Analytical and Engineering Center of the U.S. Food and Drug Administration (FDA) Laboratory in Winchester, Mass.

2. **Description:** The laboratory does not have an adequate shield for its Ge(Li) detector (i.e., one with a cover) to reduce the background count rate and enable lab staff to make quantitative calculations (FEMA-REP-1, Rev. 1, I.8).

   Recommendation: Procure this piece of equipment and obtain suitable training in its use at the Winchester FDA facility.

2.2.3 Keene IFO

The facility at the fire station in Keene is equipped adequately to support operations. The status board was utilized and maintained with current information that was available. While most necessary maps were posted, there were no maps showing evacuation routes, access control points, and radiological monitoring points. This information was available in the plans, however.

Initial notification and alerting of the Keene IFO occurs through the State Police at the "Unusual Event" state, with follow-up notification at the "Alert" ECL. State Police are notified by the utility, and in turn they radio the Southwestern Mutual Aid Radio located in the Keene fire department's dispatch center. Keene fire-department personnel verify the incoming message by a telephone call to the State EOC in Concord, then proceed to alert the local EOCs, as designated in the plan. Activation of the IFO occurs at the "Alert" ECL, with the notification of the staff coming from each parent agency represented at the IFO. In general, the alerting of staff originates from offices in Concord.

Complete set-up and mobilization of the IFO was demonstrated, with the exception of some prepositioning of personnel from Concord. The set-up of the facility was rapid and efficient, and the facility was fully staffed at 11:00 a.m. (including two-hour driving time from Concord).

The first-shift staff demonstrated adequate training and knowledge in their functions at the IFO. Twenty-four hour staffing at the IFO was demonstrated by the presentation of a duty roster; the three field teams demonstrated a full shift change.

Emergency Operations at the Keene IFO are twofold, in that overall management and direction is handled by the IFO Civil Defense Director and the direction and control of the field-monitoring teams is the responsibility of the representative from the DPH. These two groups functioned separately within the IFO facility. Improvements in interactions between these two operations would be beneficial.

The CD director, the individual in charge of the IFO operations, displayed the knowledge and training required of his position. Periodic briefings were held during the exercise; however, they were not as informationally complete nor as effective as possible. This was due in part to the level of information transfer between the State EOC and the IFO.

Agencies were interacting and relaying information to the CD director, but pertinent data were not always being given to the appropriate departments. This situation is similar to that of the State EOC. Messages were recorded on a multiple copy "Speed Letter" form but were not effectively logged in (i.e., a running sequential log of incoming/outgoing messages was not maintained). Messages were not reproduced and distributed among the agencies, excluding the verbal discussions. Therefore, message handling was not as efficient as possible. Numerous times the CD director hand-carried messages to the communication room, in the process vacating his desk. This did not produce a problem during the exercise, but it could potentially cause some confusion and possible loss of information. Security of the IFO room was maintained throughout the exercise.

The primary means of communication between the IFO, State EOC, local EOCs, and field-monitoring teams is via the Civil Defense radio, with commercial telephone lines used as backup. Although the radio system functioned better than last time, radio dead spots in the 10-mile EPZ hindered communications with field teams. Telephone backup for field teams is not suitable. The Southwest Fire Mutual Aid radio net is available to supplement the other communications systems.

Communications with the reception center were inadequate. The single telephone was busy during the limited exercise activity; if 3500 people were to move through the reception center (as predicted), the single telephone would be insufficient. There is no backup system.

EBS was not monitored at the IFO. In the area of protective actions, the IFO generally backs up local responsibilities or State responsibilities. IFO staff were knowledgeable regarding their responsibilities in this area. There was a sufficient supply of dosimeters (0-200 mR, 0-20 R) available at the IFO for emergency personnel required to go into the field. Dosimeters were charged and issued, along with record cards and instructions, to field workers prior to their departure. Permanent record dosimeters (TLDs) were also provided.

KI was available in all field operation kits. Proper instructions on its use were passed along to the emergency staff.

Decontamination procedures were demonstrated at the Keene High School Gymnasium. Field activity personnel were instructed on decontamination procedures and the location of the decontamination center.

The Department of Public Health arrived at the IFO at 9:00 a.m., and DPH staff were set up for operation by 9:15 a.m. The three field-monitoring teams arrived at 9:10 a.m. and were issued TLDs by the Department of Civil Defense, which maintains the records. Pocket (self-reading) dosimeters were checked and logs maintained by DPH. The teams departed at 9:30 a.m. to prescheduled monitoring points at the Hinsdale EOC (teams A and B) and the Chesterfield EOC (team C). The teams were well briefed on procedure by DPH before leaving.

Radio communication remains a problem at the IFO. While the expected "blind spots" were encountered by the field teams, adequate procedures have not been developed to have communications reestablished in a timely manner. In an attempt to contact the field monitoring teams, DPH telephoned the Chesterfield and Hinsdale EOCs, which did not result in timely communication and so as a result, the teams were not dispatched to proper monitoring locations.

Dose assessment was not done at the IFO, nor were reasons for dose assessment or reasons for using KI communicated to the field teams. The topographical map was not kept up-to-date, however, the DPH has small maps available. It is suggested that the larger map, which is available, be used and the plume be plotted as it moves. This would require additional training on the part of the radiological health staff at the IFO.

Projected meteorological data were not available in a timely manner, partly because of poor communications between the EOC and IFO, and between the IFO and the teams. As a result, the teams were not dispatched to proper locations for monitoring. Therefore, it is recommended that the IFO be eliminated so that deployment of the teams will occur closer to the "action" (i.e., at the EOF or state EOC).

Deficiencies and Recommendations

1. **Description:** The Civil Defense communication system did not function adequately between the IFO and field-monitoring teams. Also, there was no backup radio system; commercial telephones were used if they were available (FEMA-REP-1, Rev.1, II, F.1.d).

   Recommendation: Problems with the communications system should be identified and remedied. An appropriate backup communication system also needs to be identified and tested.

2. **Description:** The communications problems were instrumental in keeping meteorological information from reaching the teams in a timely manner, and as a result the teams were not dispatched to proper monitoring locations (FEMA-REP-1, Rev. 1, II, I.8; I.11).

   Recommendations: Adequate procedures for communicating with the field teams should be developed.

3. **Description:** There were insufficient telephone lines (1) and no backup communications system to the Relocation Center.

   Recommendations: Additional telephone lines and backup communication system to the reception center should be addressed.

4. **Description:** EBS messages broadcast were not monitored.

   Recommendation: All EBS broadcasts should be routinely monitored, along with checking with local communities as to the functioning of the public-alert system.

Areas for Improvement and Recommendations

1. **Description:** Messages were not logged, and the IFO CD director was still directly involved in message distribution.

   Recommendation: A logging system should be implemented, with an individual specifically assigned to this function. An individual other than the IFO director should be responsible for message distribution.

2. **Description:** There were no maps posted showing evacuation routes, access control points, and monitoring locations.

   Recommendation: One or more maps covering this information should be prepared for use by IFO staff.

3. **Description:** The IFO N.H.C.D.A. functions parallel actions assigned either at the local level or State level.

   Recommendation: Abolish the IFO in its entirety and transfer its civil defense functions back to the State EOC. The only function that is really necessary to maintain at Keene is that of communications.

2.2.4 New Hampshire Field Monitoring

Off-site field-team mobilization was not demonstrated. Instead, three field teams were prepositioned at the Keene IFO at the "Alert" ECL. The standard procedure for mobilization involves the Division of Public Health Services (DPHS) Emergency Planning Coordinator notifying monitoring-team personnel using Appendix B to the New Hampshire Emergency Response Procedures. This is a call list that identifies home addresses and telephone numbers of field-team members and also allows staff to be notified on a 24-hour basis. Initial notifications are made via commercial telephone.

In general, field-team equipment was adequate. The emergency procedures include an inventory list of equipment and supplies contained in radiation-monitoring kits and contamination-clothing kits. Since teams were prepositioned, equipment was inventoried prior to the exercise. Vehicles are State-owned station wagons, which are adequate in size to accommodate team members and equipment. Radiation-detection instruments used were a portable ion chamber (PIC-6A) and a radiation monitor (RM-14). Air sampling equipment included a portable air sampler that operated on power supplied from the vehicle. Filter cartridges and charcoal cartridges were available; silver zeolite and silica gel were not. Calibration of radiation- and air-monitoring equipment was current. Equipment for sampling ingestion pathway exposures (i.e., soil, vegetation, water, and milk) are not part of the kit makeup. Additional equipment includes an anemometer and barometer for confirming meteorological conditions.

Although emergency procedures are established for setting up and carrying out field operations, observation of personnel indicated that additional training is needed in the use of SOPs. When instruments were turned on, battery checks were made, but instrument response was not checked with a radioactive source. Team members operated portable survey instruments only at designated control points and not while en route to each location. Despite the radioactive release at 10:00 a.m., an air sample was not taken until 2:00 p.m. At this time the wind had already shifted, and radiation levels were at background level. The procedure checklist for set-up and obtaining an air sample was not used. It is also unclear how the 10^{-7} μCi/cc criterion is met for detecting field iodine concentrations in the presence of noble gas. Teams were familiar with the area geography and designated monitoring points and made efficient use of travel time; this is an improvement from the previous exercise.

Protective equipment for controlling radiation exposure was adequate and included full anti-contamination clothing (hood, gloves, shoe covers), respirators and filter cartridges, remote handling devices, and KI. Procedures and criteria for authorizing use of KI need clarification at all levels of the emergency organization. Pocket dosimeters of 0-200 mR and 0-20 R, and TLDs were used for maintaining exposures. Team members did not check and record readings of dosimetry at regular intervals, nor were they requested to do so by the IFO. Information was not requested by team members nor provided by the IFO in regard to special safety considerations, where radioactive releases were projected, expected radionuclides contained in the plume, and what to do after reporting results. Direction and control given to team members on how to track the plume was poor, since (a) it was never found, and (b) twice teams were sent to the same monitoring location for extended periods of time although the exact plume location was several miles away.

The unusual and dramatic wind shifts presented in the scenario made offsite field monitoring very difficult in New Hampshire and Vermont. Future scenarios should provide realistic meteorological conditions and additional time in each state for plume tracking by offsite teams.

Deficiencies and Recommendations

1. **Description:** SOPs were not followed by field teams during offsite radiological monitoring (FEMA-REP-1, Rev. 1, II, I.7; I.11).

   Recommendation: Train the offsite field teams to use and follow New Hampshire SOPs during radiological surveillance.

2. **Description:** The teams did not understand when to administer KI (FEMA-REP-1, Rev. 1, II, J.10.e).

   Recommendation: Provide training to all organizational levels on criteria for authorizing KI administration to emergency workers.

3. **Description:** Information provided to offsite teams from the IFO was cursory (FEMA-REP-1, Rev. 1, II, F.1.d).

   Recommendation: Improve direction and control given to offsite monitoring teams so that they are kept apprised of any changes which could affect radiological monitoring.

2.2.5 Keene State College Relocation Center

Keene Junior High School Mass Care Center

The Relocation Center at Keene State College was activated at 10:30 a.m., when school employees arrived and started to establish the center. At 10:45 a.m., welfare workers arrived. The center was set up in about 15 minutes, since the staff had an established floor plan and a "kit" that contains supplies and signs tailored for this type of emergency. This was good preparedness.

The Relocation Center team members were professional and knew their major roles. There were a few new players for this exercise, and they were adequately briefed by their more experienced fellow workers.

There was a need for more direct communications ability at the Relocation Center. There was only one telephone available. Although the Red Cross liaison staff had a radio with them, which was used to help support the staff from the school and welfare office, the real purpose of that radio was for Red Cross communications with its people in mass care centers. A mobile CD radio for communications with the IFO would be good backup to the telephone. It should be noted that the FEMA observer was informed later in the exercise by school officials that additional telephones could be made available, but the exercise players were not aware of this at the time.

As in the previous exercise, no medical or first aid staff were available at the Relocation Center. A controller from Civil Defense pointed out that in an emergency, an ambulance would be nearby. The Relocation Center manager/staff should have a written procedure on how to obtain predesignated medical help. Also, workers on the scene who have first aid/ CPR training should be identified.

Relocation Center staff need an SOP, or additional information in their plan, giving details on the specific kinds of help to evacuees they can provide. For instance, their plan authorizes the Relocation Center to provide financial help, but no one knew how that would be done.

As recommended from the last exercise, the State has developed a registration form for use in the relocation centers.

Although 24-hour staffing was not physically demonstrated, a staffing roster indicated a full second-shift capability.

The relocation center staff was not aware of any form, stamp, or tag that would be issued to evacuees to indicate that they had been cleared by the radiological monitoring teams.

A Mass Care Center was activated in the Keene Junior High School. A Red Cross shelter manager and a nurse were at this location. Although it was planned to have relocatees pass through this center, this did not occur. Thus, the volunteers did not get an opportunity to test their abilities.

A disaster team from the Nashua, New Hampshire Red Cross arrived at the center to assist. This allowed them to "talk through" the procedures specific to nuclear accidents.

The Red Cross had both a HAM radio operator and a Red Cross band radio. Communications capability was good. All backup help and supplies would be obtained in the same manner as they would for a natural disaster.

Deficiencies and Recommendations

(None)

Areas for Improvement and Recommendations

1. **Description:** Existing communications equipment was minimal (FEMA-REP-1, Rev. 1, II, Planning Standard F).

   Recommendation: A mobile CB radio would provide excellent backup communications capability for the Relocation Center in case of tied-up or inadequate commercial telephone availability.

2. **Description:** Staff was not informed of how to deliver the full scope of services they are being tested to provide (i.e., financial services) (FEMA-REP-1, Rev. 1, II, A.3).

   Recommendation: Identify specific agency responsibility and source of funds for providing this service.

3. **Description:** No trained medical staff were available on the Relocation Center staff for this exercise.

   Recommendation: All staff trained in first aid and CPR should be identified during actual operations.

2.2.6 New Hampshire Local EOCs

2.2.6.1 Chesterfield

The EOC located in the Town Office Building was comfortable and well lighted with sufficient space, furnishings, and telephones. Kitchen facilities exist, but there are no provisions for bringing in cots and a portable generator for supporting extended operations. The status board was kept up to date, and maps showing the EPZ, evacuation routes, and access control points were prominently displayed. Population data, while available in the plan, were not marked on the map.

Activation of the EOC began promptly after receipt of verified "Alert" messages at 9:34 a.m. from the Southwest Mutual Fire Aid warning point and the IFO in Keene. The EOC was, except for the Radiation Safety Officer, fully staffed by 9:50 a.m. Thereafter, full participation was limited, because some of the volunteer staff were called away from time to time to fulfill their regular job responsibilities. Elected officials actively participated. Round-the-clock staffing capability was not demonstrated.

The Civil Defense Director was in charge of operations under the authority of the First Selectman. He held frequent informal briefings and consulted the staff when decisions had to be made. A copy of the plan and written checklists and procedures were conveniently available for reference as needed.

The Civil Defense radio was the primary system for communicating with the State EOC and the IFO, with other radio and commercial telephone for backup. Commercial telephone was used for communicating with others, with radio as backup. All systems worked well. However, although they were affected by the plume, Chesterfield did not get any information about the release or the plume movement. They were not notified of the "General Emergency" until almost 30 minutes after it was declared.

Dose assessme[illegible]nd protective action recommendations were generated by the State and are not local responsibilities.

Public alerting and instruction was accomplished by siren and tone-alert radio activation. These activities and an EBS broadcast were originated by the State in coordination with Vermont and Massachusetts. Calls were placed to schools, nursing homes, and other public institutions. Route alerting also was simulated.

A message recommending evacuation was received at 10:45 a.m., and procedures were promptly instituted. All activities were simulated and included activation of traffic control, provisions for maintaining open evacuation routes, and provisions for transporting the mobility-impaired school children, the alcohol rehabilitation facility residents, and other residents with special needs. The EOC also was evacuated. These were very sketchy demonstrations, and actually obtaining bus transportation may be difficult during an incident.

Proper dosimetry equipment — including TLDs, survey meters, and permanent exposure record cards — were on hand. However, there were not enough of these, they were not distributed, and no instructions were given. The Radiation Safety Officer, who participated in the last exercise, did not participate in this one. On the whole, the staff appeared to be knowledgeable about exposure control.

Deficiency and Recommendation

Description: There was not enough dosimetry equipment (FEMA-REP-1, Rev. 1, II, K.3.a).

Recommendation: The state should provide additional radiological monitoring equipment.

Area for Improvement

Description: Population data were not posted on maps in the EOC. This was noted as an area for improvement in the last exercise (FEMA-REP-1, REV. 1, II, J.10.b).

Recommendation: Population data are available, and should be put on the map display for ready reference.

2.2.6.2 Hinsdale

The Hinsdale EOC located in the fire station had adequate space, furniture, and lighting, and emergency power was used for 45 minutes to operate the EOC. An EPZ map with plume sectors, evacuation routes, relocation centers, and access control points was posted, and an ingestion pathway map showing locations of farms and water supplies was displayed. A population distribution map is part of the local plan. Status boards were prominently displayed and updated frequently, and emergency classification levels were posted. Two telephone lines were available, but additional lines would enhance communications with local citizens. Physical resources were sufficient for sustaining extended operations. Cots could be brought in if necessary.

The Fire Chief was notified of an "Unusual Event" at 6:15 a.m. and activated the EOC shortly thereafter. The remaining staff were summoned as deemed necessary. Complete staffing by selectmen, Fire Chief, Police Chief, Civil Defense Director, CD Communicator, RADEF Officer, and Road Superintendent was accomplished prior to receipt of the "Site Area Emergency" notification at 9:30 a.m.

Twenty-four-hour operation of the EOC is not possible unless staffing assistance is received from the State. Activation of the EOC is possible under any weather conditions, since most of the staff live nearby.

Emergency operations were efficiently and competently managed by the Civil Defense Director. Procedures and checklists were effectively used, and message handling was fast and efficient. Information exchange among the staff members was excellent. Access control was achieved by recognition, or identification of those not recognized, and each person was logged into the EOC on a sign-in sheet.

Communications capability at the EOC was fair. The Civil Defense radio used for communicating with the IFO in Keene did not work properly, but alternate means worked well. The Southwest Mutual Aid Radio with one frequency and the telephones worked well. Although radio-pagers worked well, additional units would improve the system. Twelve pagers were distributed as follows: Fire-10, Civil Defense-1, and selectman-1. Amateur radio operators both inside and outside the EOC location added to communications ability and performance. Information flow to the EOC was infrequent, although the EOC was in the plume and was evacuated to Keene. Communications would be improved if additional strategically placed repeaters were added to the Civil Defense radio.

Public alerting was accomplished by using sirens, tone-alert radios, EBS messages, and, in some instances, route alerting. A vehicle was dispatched to a business establishment to alert them, and schools were alerted by telephone.

Seven traffic control points were established promptly and effectively by volunteer firemen. A fire would leave these traffic control points unmanned, in which case assistance would be requested from the State for their relief. The Highway Department personnel were dispatched to assist with traffic control at the school. A detailed, written list of the locations and needs of the mobility-impaired and others requiring assistance was available. Some of the persons having special needs were

notified of the simulated radiological emergency by dispatching a person in a vehicle to their homes for personal contact.

TLDs, 0-200 mR, 0-20 R dosimeters, survey meters, exposure and record cards were properly calibrated and distributed with instructions to emergency workers. The RADEF Officer and several other persons were well-trained and knowledgeable in radiological exposure control. Persons were to be sent to Keene, New Hampshire for decontamination.

Recovery and reentry procedures were not exercised.

Deficiencies and Recommendations

Description: The Civil Defense radio used as the primary means of communicating with the IFO in Keene did not work properly (FEMA-REP-1, Rev. 1, II, F.1.b).

Recommendation: Find and rectify the cause of malfunction. See that radio checks are made before placing equipment in service.

2.2.6.3 Richmond

The EOC was located in the fire station. It was well lighted and had sufficient space, furnishings, telephones, and emergency power. A clearly visible status board and an EPZ map with sectors marked off were displayed. Information on evacuation routes, access control points, monitoring points, and populations was available close at hand but was not posted on maps. No kitchen or sleeping facilities are available, but extended operations could be sustained by having food and cots brought in.

Activation of the EOC was accomplished promptly after receiving and verifying an "Alert" message at 9:32 a.m. from the Southwestern Mutual Aid warning point. Staff call-up was then done by the Fire Chief, who placed calls to key officials. Full staffing was completed 20 minutes later. Participation was excellent. Elected officials were present throughout the exercise.

Operations were well managed by the Civil Defense Director, who kept the staff informed and involved in making decisions. Plans, checklists, and written procedures were readily available, and messages were properly logged and distributed.

Communications worked well. The Civil Defense radio was the primary means of communicating with the State and local EOCs. Commercial telephones provided backup and communication with others.

Dose assessments and protective action recommendations are State Department of Health and Civil Defense responsibilities. Richmond was never in or threatened by the plume and, therefore, received no protective action recommendations or instructions for alerting the public.

Although Richmond was not evacuated, possible traffic volumes from other potential evacuation areas, a possibility of assisting other communities, access control, and protection of the mobility-impaired were discussed at length. School-bus drivers were contacted and prepared to assist with evacuation if called upon.

All necessary dosimetry equipment was on hand, properly calibrated, and distributed with instructions. The staff was aware of exposure limits and procedures for using KI if its use had been ordered by the Department of Public Health. Record keeping and decontamination procedures were also thoroughly discussed.

Deficiencies and Recommendations

None.

2.2.6.4 Swanzey

The EOC located in the fire station had adequate space, furnishings, kitchen facilities, and backup power. However, only one telephone shared with the fire department was used. The status board was kept up to date, and map displays were excellent. All necessary information, including population densities and ingestion pathway data, was posted.

Activation was accomplished after an "Alert" was declared at 9:27 a.m. The message was received from the Southwestern Mutual Fire Aid warning point. The EOC was operational at about 10:00 a.m. However, full staffing was never accomplished, nor was continuous staffing capability demonstrated.

The Civil Defense Director was in charge of operations and was supported by the First Selectman, who was in command. Copies of the plans and written checklists were used. However, no briefings were held, and messages were not logged.

Communications were not well handled. Enough radio equipment was available -- Civil Defense radio, Fire Radio Network, and spare equipment in the police department -- but only one commercial telephone shared with the fire department is not enough. No one was assigned to radio monitoring, and no message log was kept. As a result, two separate announcements of the "General Emergency" and a message from the IFO were missed. These were not equipment faults, but were caused by understaffing and they did not occur during the last exercise.

Dose assessments and protective action recommendations are handled by the State and are not local responsibility. The scenario required no protective actions for Swanzey.

Public alerting and instruction were simulated by siren and tone-alert radio activation at 10:07 a.m. and by EBS messages. These activities originated with the State and were coordinated with Massachusetts and Vermont. Route alerting and calls to schools were simulated. No EBS messages or other instructions were generated in the EOC.

Swanzey was never in the plume-exposure pathway. No protective actions were recommended for them, and no protective action procedures were demonstrated.

Proper dosimetry equipment, including TLDs and survey meters, was available. Dosimeters were charged, calibrated, and distributed with instructions. Periodic readings and exposure record keeping were simulated.

Deficiencies and Recommendations

Deficiency: Full staffing was never achieved. The radio was not monitored and several important transmissions were missed (FEMA-REP-1, REV. 1, II, I.e).

Recommendation: The town should see that capability exists for 24 hour per day staffing of communication links. If necessary, assistance from the State should be requested.

2.2.6.5 Winchester

The EOC in the Police/Civil Defense building is roomy and equipped with adequate furnishings, emergency power, and the physical resources necessary for sustaining extended operations. However, provisions should be made for installation of additional phones; only one was available. Good displays showing all necessary information were posted, and the status board was kept updated. The staff did not, however, know how to plot the plume and wind direction.

Activation of the EOC occurred at 7:30 a.m., after the 6:15 a.m. "Unusual Event" and before the 8:40 a.m. "Alert" messages were received from the Southwestern Mutual Aid warning points. A "Site Area Emergency" message from Southwestern Mutual Aid at 9:22 a.m. was followed by another from the Keene IFO at 9:31 a.m. The EOC was operational and fully staffed by 9:40 a.m. Participation and interest by the participants, including elected officials, was excellent. Staff members were clearly well qualified and trained. Continuous staffing capability was demonstrated by presentation of a roster.

Operations were managed well by the Civil Defense Director under the authority of the First Selectman. The staff was frequently briefed and consulted. Plans, checklists, and written procedures were readily available, and messages were logged properly. Handling of a simulated traffic accident was videotaped and played back. This activity was an impressive demonstration of the ability to handle an emergency without disrupting EOC operations.

The Civil Defense radio was the primary means of communicating with the State and local EOCs and the IFO. Additional radio nets, including one for ambulance services, and commercial telephones provide backup communications. However, drops should be installed so that more telephones could be quickly installed. There was a problem with the Civil Defense radio; on numerous occasions the EOC unsuccessfully tried to contact the IFO. The field teams came to the Winchester EOC to transmit information to the IFO). The field teams also experienced difficulty with radio communications and finally resorted to the telephone to communicate with the IFO.

Local EOCs play no part in making dose assessments and protective action recommendations. This is a State responsibility. Winchester was not in the plume path.

Public alerting and instruction were accomplished by siren activation coordinated with EBS broadcasts originated by the State, activation of tone-alert radios, route alerting, and calls placed to the schools and a factory. No instructions were drafted in the EOC.

Evacuation was inappropriate and not ordered for Winchester. However, there were thorough discussions of traffic volume, possible impediments to transportation, traffic control, protection and transportation for the mobility-impaired, and procedures for evacuating the schools.

The staff was well versed in radiological exposure control procedures. The supply of dosimeters, including TLDs, was adequate, and they were distributed along with exposure record forms and instructions to emergency workers. The staff was well aware of decontamination procedures and of the decontamination-center location in Keene.

Media reporters, had any appeared, would have been briefed on the local situation only by the First Selectman.

Deficiency and Recommendation

1. **Description:** The Civil Defense radio did not work well in all instances. The EOC and field teams could not reach the IFO (FEMA-REP-1, Rev. 1, II, F.1.b).

   Recommendation: The cause of malfunctions should be determined and periodic tests made to ensure that Civil Defense radio is reliable.

Area for Improvement

1. **Description:** The staff did not understand how to plot the plume configuration or wind directions (FEMA-REP-1, Rev. 1, II, O.1.b).

   Recommendation: The Civil Defense Director should apply to the State for training.

2.3 MASSACHUSETTS STATE OPERATIONS

2.3.1 Massachusetts State EOC

The EOC, located in the hardened underground Civil Defense Headquarters in Framingham, was well arranged and had all the necessary facilities for sustaining continuous operations. All necessary displays were of excellent quality and were prominently posted. A special map with an overlay was used for keeping track of the plume movement and meteorological data.

Officials from all agencies comprising the staff were present and actively participated. The EOC was activated immediately upon receipt of an "Alert" notification from the State Police warning point at 8:41 a.m. and was operational and fully staffed by 9:00 a.m. Staff call-up was done by using mobile car radios, by radio-pagers, and by personal contact. Many of the staff are fulltime paid employees normally stationed at the Civil Defense Headquarters. Continuous staffing capability was demonstrated by presentation of an organization chart and roster and by double staffing of some positions. The Civil Defense Director was clearly in charge, held frequent briefings, and involved the staff in decision making. Check lists and written procedures were used and messages were logged and distributed. Security was good; admittance to the EOC was controlled by State Police troopers, who required positive identification. The scenario limited activity for Massachusetts and required only sheltering as a protective action. The Civil Defense Director frequently contacted the EOF, the Vermont and New Hampshire Directors, and the Area IV EOC. Demonstration of interstate cooperation and coordination was excellent.

The communication system continues to improve. The Civil Defense radio had capability for direct contact with the Vermont and New Hampshire EOCs, the Area IV EOC, all Massachusetts local EOCs, the EOF, and the licensee. Extensive use was also made of dedicated land lines, and commercial telephones and RACES were available for backup. An open line to the EOF was continuously maintained and monitored. The Director of Radiation Control, who was at the EOF, used this line for frequent contacts with his NIAT representative and the Civil Defense Director at the EOC.

Dose and accident assessment and protective action recommendations were made at the EOF. The rationales for their decisions were discussed with the NIAT representative, who in turn discussed them with the Civil Defense Director. The CD Director made decisions and consulted with the other State Directors.

Public alerting and instruction were accomplished by the use of sirens, radio-pagers, and the EBS. Activation of sirens and pagers was directed through Area IV and properly coordinated with EBS broadcasts. The EOC received notification of the "Alert" and of the escalation to a "Site Area Emergency" from the EOF . Notification of escalation to "General Emergency" was, however, by a telephone call from the Media Center State representative, stating that Vermont Yankee had declared a "General Emergency" at 10:07 a.m. The Massachusetts Civil Defense Director then spent several minutes trying to verify the escalation with the EOF. This was unsuccessful, and was followed by a call from the New Hampshire Civil Defense Director, which confirmed the

escalation. The local EOCs did not receive the information until after 10:30 a.m. (some as late as 10:45 a.m.). No protective actions were recommended, although Area IV advised all residents to shelter as a precautionary measure.

After expected traffic volume had been discussed, Area IV was directed to establish access and traffic control at the appropriate places in accordance with written procedures, which were at hand. Other selected access and traffic control points were also manned by local police officers, some of whom were not provided with protective clothing or radiological instruments. Neither did they appear to be trained in protective measures.

Deficiencies and Recommendations

Description: Although the General Emergency message notification was received by the State, it did not come through NAWAS and the State Police in accordance with the communication channel shown in the plan. There was no explanation available for this incident. It could have been an EOF, EOC, State Police, or utility lapse (FEMA-REP-1, Rev. 1, II, E.1.).

Recommendation: The cause of the deviation from the warning point system should be found, if possible, and steps taken to ensure the integrity of the warning point system.

2.3.2 Area IV EOC

The Area IV EOC is housed in the Area IV MCDA Headquarters in Belchertown and is well adapted for sustaining protracted continuous operations. All displays needed for supporting the State and local EOCs were prominently posted and effectively used. Doors to the EOC were kept locked, and admittance could be gained only by presenting acceptable identification. This EOC functions primarily in coordinating logistical support for the local EOCs and as a communication link between the State and local EOCs.

Operations were managed well by the Area Civil Defense Director, who fully involved his staff and made good use of written check lists and operating procedures.

Most of the staff's daily place of employment was at the Area IV Headquarters, so the EOC was quickly activated and fully staffed. The activating call came from the Massachusetts State Police over the NAWAS, which is operational 24 hours per day. An escalation to a "Site Area Emergency" also came over NAWAS, but for some reason the escalation to a "General Emergency" came instead from the State EOC. However, this did not cause problems with the Massachusetts response. The last local EOC was notified at 10:47 a.m. that the plant was at a "General Emergency" declared at 10:03 a.m. Forty-four minutes is too long for notification of a change in emergency action level (see page 85, Deficiency 1, EOF write-up).

Communications generally worked well, and the capability of communicating with other states, the State EOC, the EOF, the Massachusetts local EOCs, and other local EOCs and communities was demonstrated. Two excellent radio systems were used: the only recently operable Civil Defense microwave system, and the Civil Defense RERP system, installed by the licensee, which used a repeater. The problems with the latter system that had surfaced as a deficiency in the previous exercise have been corrected. Local Civil Defense radio, dedicated land lines, commercial telephone, and RACES were also available. There were some isolated problems at local EOCs because of inexperience at these locations. At one local EOC the microphone was left open on the CD radio, so they could not receive and alternate means of communication had to be used initially.

The radiological officer demonstrated good training and competence in using radiological instruments, exposure record keeping, and controlling inventory. It was clear that he was capable of supporting or assisting local EOCs with exposure control if needed.

Access and traffic control were directed from Area IV and involved the use of both local and State police. These points were activated even though there was no evacuation.

Deficiencies and Recommendations

Description: There were some problems (see Leyden and Warwick) early in the exercise with communications at some of the local EOCs.

These were traced to inexperienced operators. Although backup systems worked, the primary means did not work in every location 100% of the time (FEMA-REP-1, Rev. 1, II, F.1.b.).

Recommendation: In an emergency situation, especially one involving wide participation of local communities, Area IV (or the State EOC) should see that a radio check is made to be sure that all parties are in communication.

2.3.3 Massachusetts Local EOCs

Overview

With the exception of Greenfield (population of about 18,000) which serves as a reception center, the local communities are rural, with limited resources and populations varying from 498 in Leyden to 2,386 in Warwick. The EOCs in all of these towns are staffed by volunteers with varying degrees of training. The State Plan provides for assisting the local staffs when necessary with State personnel and also provides for on-going training.

2.3.3.1 Bernardston

The EOC, located in the rear of the fire station, was minimal in terms of space and resources needed for sustaining protracted operations. Only one telephone was available. Necessary displays were posted, but sectors, populations, and access control points were not marked on the evacuation map. None of the public-information brochures said to have recently been reissued could be found.

Activation occurred at 8:50 a.m. after the Civil Defense Director received and verified an "Alert" notification from the Tri-State Warning Point. The EOC was operational at 9:00 a.m. and fully staffed at 9:30 a.m.

The Civil Defense Director kept the staff briefed, involved them in making decisions, and otherwise managed operations well. Good use was made of written checklists and procedures, and a message log was kept. A message from Area IV stating that the utility had declared a "General Emergency" at 10:07 a.m. was received by Bernardston at 10:38 a.m. Instructions for the public and sheltering activities were simulated. The staff appeared to have no understanding of the significance of the Governor's declaration of a "State of Emergency," but this was explained well by the State exercise controller. Introduction of free play by the controller added interest for the participants.

The primary means of communication was the new Civil Defense radio microwave system, which worked well. This system was supplemented by the RERP Civil Defense radio and repeater. Problems with the RERP radio at previous exercises have been corrected. RACES and a commercial telephone were also available for backup.

Dose assessments and protective action recommendations are not made locally. A local decision to shelter in-place was consistent with the developing situation. There was a good discussion about this.

Public alerting and instructions were accomplished by simulated sounding of the siren, activating of tone-alert radios, and route alerting upon notification from Area IV. Also, a call was placed to the school superintendent, and an EBS message originated by the State was broadcast over radio stations WHAT, WPOE, and WRSI at 10:05 - 10:15 a.m. Additional EBS messages were simulated later.

All protective actions, assistance with access and traffic control, and requests for assistance from Area IV were simulated. The staff were aware of individuals needing special assistance and of their special needs.

Except for permanent record exposure devices, which were not available, dosimeters in sufficient quantity were on hand, properly charged and zeroed, and distributed. However, no one present was aware of the maximum allowable exposure or of procedures to be used if the need for exceeding it occurred.

Deficiencies and Recommendations

1. **Description:** Updated public information brochures are said to have been distributed. However, none could be produced. This has been noted as a deficiency in previous exercises (FEMA-REP-1, Rev. 1, II, G.2.).

   Recommendation: Samples of public information brochures should be sent to FEMA Region I for evaluation.

2. **Description:** Although evacuation maps showing population by areas, access control points, and sector designation are in the plan, they were not shown on posted displays. This is a previous uncorrected deficiency (FEMA-REP-1, Rev. 1, II, J.10.a; II, J.10,h; II, J.10.j).

   Recommendation: On at least one of the display maps in the EOC, show sector markings, populations, and access control points.

3. **Description:** Permanent record exposure devices were not available (FEMA-REP-1, Rev. 1, II, K.3.a.).

   Recommendation: Ask the State to see that permanent record exposure devices are provided.

4. **Description:** No one present was aware of the maximum allowable dose or of procedures for authorizing emergency workers to incur exposures exceeding the EPA PAGs (FEMA-REP-1, Rev. 1, II, K.4).

   Recommendation: Provide additional training for all of the EOC staff.

2.3.3.2 Gill

Space and furnishings at the EOC were sufficient, and protracted operations could be sustained. Noise control was improved by construction of a room for communications equipment separate from the operations area. Evacuation routes and relocation center locations were available, but were not posted for ready reference. Access control points and populations also were not posted, and a status board with classification levels was still not available.

Activation of the EOC was initiated by an "Alert" notification by Tri-State Fire radio at 8:41 a.m., and full staffing was completed at 10:00 a.m. Some key staff persons were alerted by radio-pagers activated by Tri-State Fire. Other personnel were called up by telephone, using an automatic dialing system. Staffing for continuous operations was demonstrated by presentation of a roster. Reliefs for each EOC staff position were identified by name, except for the dispatcher, who is a key person. Someone should be trained as a relief for the dispatcher and included on the roster.

The Selectpersons were in charge, and operations were directed by the Civil Defense Director under his authority. The staff worked well together, and activities were coordinated. However, some changes in management procedures would have improved emergency response capabilities. A status board should have been provided and used to post emergency classification and key events, and periodic briefings should have been held to keep the EOC staff updated on all activities. The plume pathway should have been drawn on a map. During the exercise, there was a period of confusion over wind direction which might have been avoided if the plume had been continuously plotted. Also, if well-organized check lists and written procedures had been available for ready reference, traffic and access control could have been implemented more promptly.

Several radio channels were available for local and regional communication, including the Tri-State Mutual Aid Fire network, the new Civil Defense microwave frequencies, the RERP Civil Defense network with repeater capability, the Highway Department radio, and amateur radio on the 2-meter band. Two telephone lines were used as backup. The equipment worked well and the local operators were competent, but communications were sometimes slowed by procedural problems; specifically, transmission of messages from Area IV was hampered by frequent break-up of the transmission in the morning, apparently caused by an inexperienced operator at Area IV. Transmissions significantly improved in the afternoon. Also, messages were laboriously copied by the communication officers. A preprinted message multi-form with checkoff boxes for times, emergency action level, wind direction, and other data would have improved message handling, transcription accuracy, and information distribution.

Public alerting and instruction were accomplished by tone-alert radios, EBS broadcasts, and route alerting using fire trucks equipped with PA systems. The fire department also uses a boat equipped with a hailer for alerting river traffic.

The EOC makes no dose assessments or protective action recommendations but is responsible for implementation of the recommendations passed to it from the State. Sheltering was the only protective action recommended and was properly handled. Except for permanent record dosimeters, which were not available, appropriate

dosimeters in sufficient quantity were on hand and were properly zeroed, charged, and distributed with instructions for their use. Proper use of a GM counter for checking field personnel for contamination was demonstrated. The figure quoted for maximum allowable exposure was wrong, indicating a need for some refresher training.

Deficiencies and Recommendations

1. **Description:** No permanent exposure record devices or record keeping forms were available. Little knowledge of exposure record keeping procedures, allowable exposure level, or procedures for getting permission to exceed PAGs was evident (FEMA-REP-1, Rev. 1, II, K.3.a.; II, K.4.).

   Recommendation: The State should take whatever action is necessary to provide permanent exposure record devices, record keeping forms, and additional training in allowable exposure limits.

2. **Description:** Displays did not contain all required information, such as population, and access and traffic control points. No status board was available (FEMA-REP-1, Rev. 1, II, J.10.a.; II, J.10.b.).

   Recommendation: Ask for State assistance, if necessary, in upgrading displays and instructions for their use.

3. **Description:** No one is named as a relief for the dispatcher (FEMA-REP-1, Rev. 1, II, A.2.a.).

   Recommendation: Include the name of the person who will provide relief for the dispatcher and provide this person with adequate training.

2.3.3.3 Greenfield

The EOC had sufficient well-lighted space in the fire station, complete with backup power and other resources needed for sustaining protracted operations. A status board (missing in previous exercises) with classification levels posted and maps showing all required information were prominently posted and effectively used. Greenfield is designated as a Reception Center, and only a small portion is within the 10-mile EPZ. The Reception Center located in the Greenfield Community College outside the 10-mile EPZ was not activated for this exercise.

Activation of the EOC was initiated by a verified notification of an "Alert" message from Tri-State Mutual Fire at 8:38 a.m. Staff call-up was from written telephone lists. The EOC was operational at 9:00 a.m. and fully staffed at 9:45 a.m. A roster showing the names of all relief personnel was presented as evidence of continuous staffing capability. The staff appeared to be competent and well trained.

The Civil Defense Director was in charge of operations, used his staff effectively, and kept them briefed. Checklists and written procedures were used, and messages were logged, reproduced, and distributed. Notification of a "Site Area Emergency" was received from Greenfield Mutual Fire at 9:23 a.m. and of a "General Emergency" at 10:32 a.m. from Area IV.

Communications were excellent, having been improved by the fully implemented new Civil Defense microwave radio system. Operators were obviously better trained than they were for the previous exercise. Besides the new microwave radio system, the Civil Defense RERP radio, the Tri-State Fire Net, a dedicated land line, RACES, teletype, and commercial telephones were available. Communication with ambulances was provided by the Franklin County Ambulance Network.

Dose assessments and protective action recommendations were made at the EOF and provided to the local communities through the State and Area IV EOCs. No protective action recommendations were necessary or made for Greenfield. The scenario did not require Greenfield to implement public alerting and instruction.

All required dosimetry equipment was on hand in sufficient quantity, properly calibrated, and distributed with instructions. Procedures for decontamination were well known, but no one present was aware of the allowable exposure limit or of procedures for obtaining permission to exceed the EPA PAGs if necessary.

Deficiencies and Recommendations

None.

2.3.3.4 Leyden

Leyden has a population of only 498 people, and all of the EOC staff are volunteers. They also are town officials. This made it difficult for them to participate fully in an exercise held on a working day, when they had to take time away from their government responsibilities. The Town and State are aware that in a real emergency the Town would have to rely on the State for support. A State Controller was assigned to Leyden for this exercise.

The EOC, located in the basement of the town hall, was small but suitable for the small staff. There is room for expansion if needed. A portable generator was available for backup power. Resources, except for sleeping quarters, are adequate for extended operations. Cots could be brought in, but most people would simply go home. With such a small population, continuous staffing would be more of a problem. Displays were minimal. An EPZ map was posted. A status board was available, but not fully utilized. Although all necessary information was available, it should be put on maps for ready reference during an emergency.

The EOC was activated by a message from Tri-State Fire stating that an "Alert" had been declared at the utility. The message was received at the fire station by the Deputy Fire Chief at 8:50 a.m. He in turn notified the Selectmen, one of whom is the Civil Defense Director. From this point on, staff call-up took place with minimal participation. Some town officials appeared periodically but stayed briefly. EOC operations were handled most of the day with only three people — the Civil Defense Director, Road Superintendent, and the Deputy Fire Chief. The EOC was never fully staffed.

The First Selectman, who was the official in charge according to the plan, was unable to participate. The Civil Defense Director did not seem to have management well in hand and was not very familiar with the plan. Written checklists were available, but there was no activity for Leyden. The few messages directed to Leyden were not logged.

Communications capability was good. The primary system was the Civil Defense radio network, which was supplemented by RACES, and commercial telephone. The staff was not familiar with the radio equipment but was properly instructed by the Area IV communicator; and communications worked well thereafter. The staff said the officials who normally would have participated were entirely familiar with the equipment. The State Controller used the exercise as a training opportunity for those present and actually injected himself into response activities. He suggested keeping a message log, gave instructions on radio operation and the preparation and use of dosimeters, and explained the importance of maintaining a status board and posting information on maps. He also gave an informative lecture on radiation, radiation safety, protective actions, and nuclear power plants.

Leyden was never in the plume-exposure pathway, and no protective actions were recommended for them by the State. The staff did, however, check the dose-rate information they had received and were satisfied that no need for protective actions or public alerting was indicated. They were aware of sheltering and evacuation as protective actions and had a thorough discussion about them.

Public alerting and instruction would have been done by using the NOAA tone-alert radios, route alerting, EBS broadcasts, and the fire station siren.

The siren is not effective in itself as a warning to all of the population. It cannot be differentiated from a fire alarm.

Deficiencies and Recommendations

1. **Description:** Displays, such as a status board and maps, while available, were not used. This deficiency was also noted in previous exercises (FEMA-REP-1, Rev. 1, J.10.1; II, J.10.b.).

   Recommendation: Improve the quality of displays and include such things as populations, access control points, relocation centers, and evacuation routes on them, and train the EOC workers in their use.

2. **Description:** Because of the inadequate training of the EOC staff, the controller performed emergency response functions (FEMA-REP-1, Rev. 1, II, N.1).

   Recommendation: Controllers should be instructed not to assist or prompt players. The State should follow its own procedures to provide assistance to communities that are not adequately staffed.

2.3.3.5 Northfield

The space in the EOC was somewhat limited. It was set up at the fire station instead of at its normal location in the Town Hall. This caused some problems with using the new Civil Defense microwave equipment, which was left installed in the Town Hall. Resources for extended operations were available. A status board was available but was not kept current, and displays did not show evacuation routes, relocation centers, or populations by evacuation areas. However, they did plot the plume.

Activation of the EOC occurred at 8:40 a.m. with receipt of an "Alert" message from the Tri-State Fire warning point in Greenfield. The EOC was fully staffed by 8:50 a.m. Continuous staffing capability was demonstrated by presentation of a roster. Participation by this small community of only 2,386 persons was outstanding. Up to 15 volunteers were present on a normal working day throughout the exercise.

The Civil Defense Director is also an elected selectman and was clearly in charge. He delegated authority and coordinated activities. However, his job would have been easier and handled better if the status board had been kept up to date and if more informative displays had been used. Message logs were kept but not distributed. However, periodic briefings were held to keep the staff informed. Location of the new Civil Defense radio system away from the EOC and lack of message forms hampered message handling.

Communication capabilities — consisting of two Civil Defense radio networks, Tri-State Fire network, RACES, dedicated land line, and commercial telephone — were excellent. However, the effectiveness of the new Civil Defense radio was diminished because it was not located in the EOC used for this exercise.

Dose assessments and protective action recommendations are responsibilities of the utility, EOF, and State EOC. Sheltering in-place was instituted after the wind shifted and blew to the south.

Public alerting and instruction were initiated by a call from Area IV at 12:40 p.m. Calls were placed to schools at 12:45 p.m., and siren activation and route alerting began at 12:48 p.m. Simulated EBS broadcasts were originated by the State EOC. These messages included guidance for the public in taking shelter. No instructions for the public were generated in the Northfield EOC, and none were required (because of the State EBS messages). Evacuation was not recommended as a protective action, but the staff was aware of the identity of and the locations and special needs of the mobility-impaired, and agreements are in place for transportation of school children. Access and traffic control would have been maintained by local police. It was not clear as to who or what agency is responsible for halting rail traffic.

A sufficient supply of dosimeters was on hand. They were properly calibrated, charged, and distributed, and readings were recorded. A good knowledge of dosimetry was demonstrated.

There was no media activity. Had media persons appeared, they would have been briefed on only the local situation by the selectman and directed to the Media Center for other inquiries.

Deficiencies and Recommendations

1. **Description:** The status board was not kept up to date, and displays lacked complete information (FEMA-REP-1, Rev. 1, II, J.10.a.; II, J.10.b).

   Recommendation: The status board should be used in future exercises and the information on displays improved.

2. **Description:** Effectiveness of the new Civil Defense radio microwave system was diminished because of its location away from the EOC (FEMA-REP-1, Rev. 1, II, F.1.b.).

   Recommendation: A permanent location for the EOC should be established so that communications equipment can be permanently installed therein.

2.3.3.6 Warwick

The EOC was located on the second floor of the fire station. Space, furnishings, and lighting were ample. Back-up power capability was demonstrated by putting the EOC on emergency power during the exercise. Noise, attributable to RACES operations in the EOC operating area, was a problem that will be resolved by relocating the equipment and/or equipping the operator with a headset. Although no kitchen or sleeping facilities exist, other resources appear sufficient to support extended operations. The status board was kept up to date and was used effectively, but it could have been more conveniently located. Information about evacuation routes, relocation centers, and population was available but was not displayed for ready reference. However, an EPZ map with clearly labeled sectors and access control points was displayed.

Activation of the EOC occurred when the Civil Defense Director was notified by Tri-State Fire at 8:42 a.m. that an "Alert" had been declared by the utility at 8:30 a.m. The call was verified, and the EOC was fully staffed by 9:30 a.m. Round-the-clock staffing capability was demonstrated by presenting a roster and by discussions with the staff.

Warwick was not in the plume exposure pathway and was required to take no protective actions, so activity at this EOC was minimal. The staff was, however, able to demonstrate a capability in response activities and familiarity with the plans. The Civil Defense Director, who was also the radiation safety officer, was in charge and saw that the staff was kept informed.

Communicating capability is excellent. The EOC is equipped with the new Civil Defense microwave radio and has the older Civil Defense RERP system. RACES was also in place and operating. Commercial telephones were used for other alternate and backup communications. Communications worked well. However, early in the exercise the Civil Defense radio was not set up properly, the result being that the EOC could transmit but could not receive. The problem was rectified when brought to the EOC Director's attention.

Dose assessments and protective action recommendations are State and utility responsibilities. No protective action recommendations were made for Warwick, which was never in the plume.

Public alerting and instruction were not required in this exercise. However, the Civil Defense Director explained that the public would be alerted by tone-alert radios and route alerting. Instruction would be given by personal contact, radio and telephone messages, and EBS broadcasts. There are only 32 families in the 10-mile EPZ.

No protective actions were required for Warwick. However, the one mobility-impaired individual is known, and the town has the resources to provide for this person's transportation and other needs.

Deficiencies and Recommendations

1. **Description:** Displays did not include all necessary information for ready reference (FEMA-REP-1, Rev. 1, II, J.10.a; II, J.10.b.; II).

   Recommendation: Although the total population of Warwick is only 603, the maps containing population distribution, relocation centers, and evacuation routes should be clearly posted. Space should be provided in the EOC for this purpose.

Area for Improvement

1. **Description:** The primary Civil Defense radio system was inoperative during part of the exercise because of improper set up caused by confusing instructions accompanying new equipment. (FEMA-REP-1, Rev. 1, II, F.1.b.).

   Recommendation: The State should provide means of handling a radio check when going into an area-wide emergency operation.

2.4 UTILITY AND STATE COORDINATION

2.4.1 Emergency Operating Facility

The Emergency Operating Facility (EOF) is currently located on-site in the Governor Hunt House. As noted in previous exercise reports, this location does not offer enough protection for the emergency workers in the event of a release of radioactive materials. The utility is currently constructing a new EOF approximately eight miles away from the plant, which should solve this problem.

The state representatives at the EOF were professional and conferred with each other during the exercise. The recovery manager and/or his assistant briefed the state representative frequently, but meteorological data and plume-movement projections did not reach the recovery manager in a timely manner, which delayed the receipt of this information by the state representatives. The state representatives promptly transmitted information about the status of the plant and other data to the State EOCs. The Civil Defense representatives from Hampshire did not appear to have any clearly defined duties, and therefore their communications with the State EOC in Concord appeared to be sporadic.

Utility dose estimates and protective action recommendations were evaluated for reasonableness by the state representatives at the EOF. After they concurred in the information, they transmitted it to their respective EOCs. The utility utilizes a computer model that uses a video display to project the plume path as an overlay on a map of the area.

The plume projection had to be translated by the state representative at the EOF before this information could be passed over the telephone to the State EOC; this complication caused some delays.

The States of Vermont, New Hampshire, and Massachusetts were not officially notified by the utility of the change in status from a "Site Area Emergency" to a "General Emergency." This procedural failure caused serious delays in the notification of state and local governments. Massachusetts spent approximately 15 minutes trying to verify the change in status, which in turn caused delays of from half an hour to almost an hour for notification of local officials. Similar, although not as severe, problems occurred in New Hampshire.

Deficiencies and Recommendations

1. **Description:** Communication procedures between the states and utility as given in their respective plans were not followed for the General Emergency Classification, which caused serious delays in official notification of state and local governments (FEMA-REP-1, Rev. 1, II, E.1).
   (CATEGORY A DEFICIENCY).

Recommendation: Review, revise, and coordinate plans among all parties to develop a better system for notification of state decision makers of changes in emergency classification levels.

2. **Description:** The utility did not provide states with meteorological data and plume-movement projections in a timely manner (FEMA-REP-1, Rev. 1, II, I.8).

   Recommendation: Revise procedures so that meteorological and other pertinent data are provided to the states in a timely manner. Consider installing terminals in all state EOCs so that they can receive the computer-generated output.

- **Area for Improvement**

  Description: State of New Hampshire Civil Defense representatives did not have clearly defined duties.

  Recommendation: Revise procedures to more clearly define the duties of New Hampshire Civil Defense representatives at the EOF.

2.4.2 Media Center

The Media Center for the Vermont Yankee Nuclear Power Plant is at Dalem's Chalet in Brattleboro, Vermont. Facilities were adequate, with obvious improvements made since the last exercise, including a backup power generator and an increased number of telephone lines for media use. Supplies and facilities for PIOs were excellent, but those for media were minimal. There is a need for additional lighting in the media working area, since the location is in a rather poorly lighted dining area and could present a problem during non-daylight hours. Also lacking was the availability of charts and displays for demonstration purposes.

Activation and staffing were generally good. Pre-exercise positioning of staff and supplies at the Media Center was kept to a minimum. Staff members began to arrive with equipment around 8:30 am, setting up the Media Center and installing telephone lines for reporters. This was a much more realistic approach than that taken in past years. Organizations represented included: Vermont Yankee, the Governor of Vermont, the Governor of New Hampshire, New Hampshire Civil Defense, and Massachusetts Civil Defense. The NRC had two player responders in the center. All participants appeared knowledgeable and can be notified and mobilized on a 24-hour basis.

While the utility had sufficient clerical support staff, the State PIOs did not.

A variety of communication links were available and demonstrated, including commercial phone lines, ring-down phones, computers, radios, walkie-talkies, and telecopiers. As a result, there was sufficient communication backup when the utility and the NRC computers went down; one telecopier malfunctioned; and one state PIO telephone line went dead.

Information functions at the Media Center were disturbingly uneven. This year's performance contrasted markedly with the outstanding one during the 1983 exercise. The number of briefings (4) was adequate, but they were not nearly as thorough or complete as they should have been. State PIOs were not kept well-informed about the status of the plant or the nature of the release. Only two small charts were available, and only one (the EPZ chart) was referred to by the utility spokesperson. State PIOs conferred continually. However, formal written news releases from the utility, while available promptly, were written and approved at the EOF and shown by the utility PIO to State PIOs with no opportunity for them to review or make possible changes. As a result, several news releases were issued containing factual errors or discrepancies:

(1) At a 9:35 a.m. briefing, while the plant was in a "Site Area Emergency" status, the first utility news release of the exercise stated that the reactor had been operating at 47% power just prior to the incident, went to 0% power immediately following the incident and was now at 0% power. However, at the 10:23 a.m. briefing, when the plant status went to "General Emergency," a second utility news release stated that the reactor had been at 0% power prior to the incident.

(2) The second utility news release issued at the 10:23 a.m. briefing contained a shelter recommendation for residents of North Hinsdale, New Hampshire. In fact, however, that recommendation should have been made to New Hampshire State Authorities, not directly to the residents of North Hinsdale. When confronted by the State PIOs on this matter, the utility spokesperson simply stated that it is the prerogative of the utility to make public its protective action recommendations. This raises a serious issue as to whether a utility should make public it's protective action recommendations before the states have had the opportunity to consider the recommendations and take appropriate action. Had this been an actual accident, the confused and conflicting protective action information conveyed to the public could have had serious consequences.

(3) The same utility news release also stated that the Vermont Yankee Nuclear Power Plant had been evacuated. This factual error was corrected during the question and answer period of a subsequent media briefing when the utility PIO stated that only non-essential personnel had been evacuated from the plant. However, the news release itself was never retracted and corrected in written form, and it was still available for distribution.

Furthermore, the misinformation that the plant was completely evacuated was perpetuated in the 11:50 a.m. utility media release, which again stated that Vermont Yankee personnel had been evacuated from the site. This allowed the erroneous impression of a completely abandoned plant to be conveyed to the public. Moreover this media release was sent by telefacsimile to the New Hampshire State EOC, which created additional confusion for State decision makers.

The utility spokesperson did not keep State PIOs adequately informed on a timely basis of changes in plant status and other relevant information. For example, the Massachusetts PIO questioned the utility PIO on the nature of the radioactive release during the question and answer period of the first media briefing. This was the only opportunity he had at that point in the exercise to get the information from the utility PIO.

In a past exercise, the fact that the Media Center is located within the 10-mile EPZ was listed as a deficiency. All three states have since responded that it is the responsibility of the utility to designate the location of the Media Center. The Media Center is still within the EPZ.

The subject of the media center location was raised by a participating reporter during a media briefing and resulted in a misleading response. In answer to a question on whether the Media Center was safe, the utility PIO said the location was approximately

10 miles from the plant and that those inside were safe. The Media Center is actually 7 1/4 miles from the plant and would have to have been evacuated if the plume had headed in its direction. In a post-exercise debriefing, the utility PIO indicated that the backup Media Center is the Quality Inn in Brattleboro. This is also inside the 10-mile EPZ.

Deficiencies and Recommendations

1. **Description:** The utility disseminated misleading and inaccurate public information, including protective action recommendations that could have conflicted with those recommended by State authorities. In a real incident, this would have confused the public (FEMA-REP-1, Rev. 1, G.4) (**CATEGORY A DEFICIENCY**).

   Recommendation: The utility should revise its method of developing and issuing news releases to ensure accuracy of content. It should reconsider its policy of making public its protective action recommendations before the States have been notified and have had the opportunity to consider the recommendations and take appropriate action.

2. **Description:** There was a lack of genuine coordination and cooperation between the utility and State PIOs. Utility news releases were issued without giving State PIOs the opportunity to review them for possible changes and comments. The utility PIO failed to keep State PIOs sufficiently briefed on a timely basis regarding plant status and the changing situation.

   Recommendation: The utility spokesperson should coordinate information flow with State PIOs, allowing them to review news releases for possible changes. The utility spokesperson should also brief State PIOs on a timely basis.

3. **Description:** The Media Center is still located in the EPZ, as is the designated backup Media Center.

   Recommendation: The Media Center and backup should be located outside of the EPZ.

Areas for Improvement and Recommendations

1. **Description:** Inadequate availability of charts, maps, and other visual displays.

   Recommendation: The Utility should increase the use and improve the quality of charts, maps, and other visual displays to serve as illustrations during briefings.

2. **Description:** Lighting in the media working area was dim. This could present a problem during non-daylight hours.

   Recommendation: The utility should see that adequate lighting is provided in the media working area.

3. **Description:** Clerical support staff was available for the utility, but not for State PIOs.

   Recommendation: The utility should provide clerical backup for State PIOs.

3 SUMMARY LISTING OF DEFICIENCIES

Section 2 of this report lists deficiencies with recommendations noted by the federal evaluators of this exercise. These evaluations are based on the applicable planning standards and evalulation criteria set forth in Section II of NUREG-0654-FEMA-1, Rev. 1 (November, 1980), exercise objectives, and the evaluation criteria provided in Sec. 1.5 of this report.

The Regional Director of FEMA is responsible for certifying to the FEMA Associate Director, State and Local Programs and Support, Washington, D.C., that any deficiencies noted in the exercise have been corrected and that such corrections have been incorporated into the plan.

FEMA requests that the states and local jurisdictions submit the measures they have taken or intend to take to correct deficiencies. FEMA recommends that a detailed plan, including projected and actual dates of completion for implementing corrective actions, be provided if corrective actions cannot be instituted immediately.

Deficiencies fall into two categories:

A. Deficiencies that cause a finding that off-site emergency preparedness was not adequate to provide assurance that appropriate measures can and will be taken to protect the health and safety of the public.

B. Deficiencies were identified where demonstrated (and observed) performance during the exercise was considered faulty. Corrective actions are considered necessary, but other factors indicate that reasonable assurance could be given that, in the event of a real radiological emergency, appropriate measures can be taken to protect the health and safety of the public.

Three deficiencies in category A were identified in this exercise. Both category A and category B deficiencies identified in this exercise are summarized in Table 2.

Table 3 is a compilation of the current status of deficiencies identified in the February 1982, September 1983, and April 1985 exercises. Table 4 lists the status of each of the 35 FEMA Core Objectives for each state and local jurisdiction by exercise year.

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Vermont State EOC					
1. Description: Decision making at the EOC was sometimes delayed due to the relative inexperience of some EOC staff members in radiological emergency preparedness exercises. Because of this, the complex interaction of staff members required for decision making was not always efficient. Recommendation: EOC staff and decision makers should participate in future training drills and exercises to improve the efficiency of decision making.	0.1,0.5				
2. Description: Some difficulty was observed in formulating protective action messages, which resulted in delays in getting these messages to the local EOCs. Recommendation: Prescripted messages should be used whenever possible to eliminate delays caused by deciding on wording of messages.	E.7				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
3. Description: Even though the field monitoring teams adequately performed their duties prescribed in the Vermont State plan, the low dose limits precluded the identification of the plume boundary and field verification of dose projections. Furthermore, the RAC believes that the low allowable-dose limits render the Vermont field-monitoring teams incapable of providing accurate field verification. Thus, Vermont would be dependent on utility field-monitoring data and would not be able to verify the dose projections independently. Recommendation: It is suggested that Vermont make better arrangements to locate and track the airborne radioactive plume. This may include changing state guidelines and field procedures to allow for the entry of field-monitoring teams into areas suspected to be in the plume. This could be done without exceeding EPA exposure limits and would allow the state to obtain radiation measurements.	I.9,I.11				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Vermont State Laboratory					
1. Description: The State Laboratory is not adequately equipped to handle the number of samples and radioactive waste resulting from a significant incident at the Vermont Yankee Nuclear Power Station. Recommendation: Upgrade the facilities at the State Laboratory, including: (1) additional hood capacity, and (2) improved waste handling.	H.12,I.8				
2. Description: The laboratory personnel were not adequately prepared to handle the kind and number of samples resulting from a significant incident at the Vermont Yankee Nuclear Power Station. Recommendation: Provide additional training and new record keeping procedures for the State Laboratory personnel.	O.4.c				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Incident Field Office (IFO)					
1. Description: No effective centralized management and integrated control of the operations and activities at the Vermont IFO (Brattleboro) were evident during the exercise. Recommendation: The organizational responsibilities and staff assignments at the IFO should be reviewed and modifications implemented, if necessary, in order to ensure the effectiveness of integrated management and control at the facility.	A.1.b, A.1.d				
2. Description: The Vermont IFO in Brattleboro is inadequate to handle actual emergency operations, since the facility is within the 10-mile EPZ and is presently unhardened. This would require evacuation in the event that protective actions became necessary. Recommendation: The IFO should either be relocated at a greater distance from the plant or hardened to provide habitability in the event of an actual radiological emergency.	H.3				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

	Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
3.	Description: One of the Vermont Agency of Transportation employees was unaware of procedures for radiological exposure control and had not been issued any radiological measuring instruments. Recommendation: All emergency workers assigned to duties in the EPZ should be trained in proper radiological exposure-control techniques and should be issued proper dosimetry devices as appropriate.	K.3.a, K.3.b				
4.	Description: Although Vermont IFO staff arranged for evacuation buses and a staging area for the buses, staff members were unclear on bus route assignments and the identity of the agency contact for ordering the commencement of bus evacuation. Recommendation: Additional training of IFO staff involved in the coordination of bus evacuation is required to ensure that they are familiar with bus route assignments and can identify the individual who authorizes the dispatching of the buses for evacuation.	A.1.b, J.10.g, O.1				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
5. Description: Radiological exposure control for Vermont IPO workers and emergency workers dispatched from the IPO was inadequate with regard to knowledge of proper procedures and issuance and use of dosimeters. Recommendation: Additional training of IPO emergency personnel in radiological exposure-control equipment and procedures is required.	K.3.a, K.3.b, O.1				
Vermont Field Monitoring					
1. Description: The field teams lacked familiarity with the instrumentation. Recommendation: Provide the field teams with more training in how to use their equipment and a better understanding of what they will be looking for in the field (i.e., noble gases and iodine, not alpha radiation).	I.8				
2. Description: The monitoring surveys were incomplete; only closed-window readings were done.	I.8				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Recommendation: Surveys should include open- and closed-window readings and measurements at ground and waist levels.					
3. Description: Teams did not have the capability for measuring radioiodine in the field. Recommendation: Verify if air-sample pumps and current procedure will allow detection of 10^{-7} microcuries per cubic centimeter, or consider using a higher-volume pump, silver zeolite cartridges (in an actual emergency only), and counting using a pancake probe. In addition, the procedure must be modified to instruct teams to leave the plume to count the samples.	H.7,I.9				
4. Description: Not all team members had permanent record dosimeters. Recommendation: Provide all field-monitoring team members with permanent record dosimeters.	K.3.a				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
5. Description: Vermont does not have a numbering system for its field-monitoring points. Recommendation: Develop a numbering system for the field-monitoring points.	J.10.a				
6. Description: Radio communications were from the field teams to the State EOC instead of to the IFO, a procedure not in accordance with the plan. Recommendation: Because this worked well, it is recommended that the plan be modified to bypass the IFO.	F.1.d				
Brattleboro					
1. Description: Emergency personnel at the Brattleboro EOC generally were unable to properly assess accident-assessment information. Recommendation: Additional training should be provided for Brattleboro EOC staff to enhance their ability to assess accident-assessment information.	I.8,O.1				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

	Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
2.	Description: The simulated EBS messages on sheltering and evacuation did not provide sufficiently detailed information on who specifically should shelter and evacuate. Recommendation: EBS message formulation should be improved so that it is clearly understood by the public who is to shelter and evacuate.	E.5,E.7				
3.	Description: Radiological exposure control was weak at the Brattleboro EOC. The direct-read dosimeters were not read and recorded on a regular basis, and permanent record devices were not available. Recommendation: The Brattleboro EOC staff should receive additional training in radiological exposure control procedures and permanent record dosimetry should be provided.	K.3.a, K.3.b, O.1				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Dummerston					
1. Description: Periodic problems again were encountered with the radio-telephone communication system at the Dummerston EOC. Recommendation: The radio-telephone equipment at the Dummerston EOC should be evaluated and either repaired or replaced with more dependable equipment.	F.1.b, F.1.d				
2. Description: The Dummerston EOC did not fully demonstrate its capabilities to implement a radiological exposure control program. Recommendation: The capabilities of Dummerston EOC relative to radiological exposure control should be fully tested in a future exercise.	K.3,K.4				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Guilford					
1. Description: A copy of the Guilford emergency plan was not available for reference at the EOC. Recommendation: An up-to-date copy of the Guilford plan should be kept at the EOC for reference by EOC staff.					
2. Description: At the Guilford EOC, the radio-telephone, which is the primary communication system, worked poorly during much of the exercise. Recommendation: The radio-telephone equipment at the Guilford EOC should be evaluated and either repaired or replaced with more dependable equipment.	F.1.b, F.1.d				
3. Description: The Guilford EOC did not fully demonstrate its capabilities to implement a radiological exposure control program. Dosimeters were not observed at the EOC, permanent record dosimeters were known by the staff not to be available, and EOC staff were not suitably trained in the use of dosimeters.	K.3,K.4, O.1				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Recommendation: Dosimeters should be stored at the EOC facility, permanent record dosimeters should be procured, and emergency staff should be trained in radiological exposure-control procedures.					
Vernon					
1. Description: The Vernon EOC Director became too personally involved with the routine tasks of monitoring incoming radio transmissions and preparing message logs. Recommendation: Routine tasks should be delegated to other EOC staff members in order to free the Director for the primary responsibility of decision making.	A.1.d				
2. Description: The Vernon EOC staff were observed to be unsure of the division of responsibility in decision making between the State and the local EOC.	A.1.b				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Recommendation: Additional training of the Vernon EOC decision-making staff is needed in order to ensure that staff members are aware of which emergency decisions are to be made locally.					
3. Description: The sounding of the sirens in Vernon was not coordinated with the EBS message. Recommendation: Procedures should be revieved and expanded, if necessary, to ensure that sounding of the sirens and the EBS message are properly coordinated.	E.5				
4. Description: The Vernon EOC staff indicated that Vernon resources were not sufficient tp staff all traffic control points; however, no staff members were observed to contact the State to request assistance. Recommendation: Improve coordination between the State and the Town of Vernon to ensure that all traffic control points are manned in a timely manner.	A.1.b, J.10.j				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
5. Description: During the evacuation the Vernon EOC recommended to the school that relocation be to Greenfield, Massachusetts, rather than to Bellows Falls, Vermont, as recommended by the State. Recommendation: Procedures on relocation should be reviewed to ensure that evacuees are directed to the proper relocation center.	J.10.a, J.10.h				
6. Description: Permanent record dosimeters were not available at the Vernon EOC. Recommendation: A sufficient number of permanent record dosimeters should be procured for distribution to emergency workers at the Vernon EOC.	K.3.a				
7. Description: The Vernon EOC staff were not knowledgeable about proper procedures for the use of KI. Recommendation: The Vernon EOC staff should be trained in procedures for the proper use of KI.	J.10.e, J.10.f				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
New Hampshire State EOC					
1. Description: There were significant lapses in internal communications between upper-level operations management and EOC operations staff. The most significant example of this is that the operations room staff was never informed that a release was in process, or that it had subsequently been terminated. This was also reflected in the status boards in the operations room, where the release data were never recorded. Recommendation: Operations management should take positive steps to remedy the situation by stationing itself in the operations room and conducting most of its business there. By operating out of the office of the Governor's representative, and moving the NAS phone into that office, operations management moved the most valuable communications link in this exercise away from the EOC staff. All information received in the EOC should be transferred to the Operations Officer as a matter of course,	A.2.a, F.1.d				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
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Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
regardless of where it is initially received. Critical information should be immediately broadcast over the PA system to ensure its dispersal, thus cutting through possible administrative delays in hard-copy message handling. (In this case, however, hard-copy message handling was not the problem; it was hard-copy message generation.)					
2. Description: Exchange of information among the Department of Public Health accident assessment staff and between representatives of DPH management and Civil Defense operations management, did not result in rapid enough communication of accident assessment data from the plant and field for the Governor to make appropriate protective action decisions. (CATEGORY A DEFICIENCY) Recommendation: The Department of Public Health and Civil Defense management teams must be informed immediately of all changes in plant status, meteorological conditions, field monitoring data, and the implications of the data for protective action recommendations. Therefore, the plan	Planning Standards A and F				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
procedures should be reviewed and changed, as necessary, so that the information flow will become more rapid and comprehensive. All staff connected with the emergency operations should then be trained to recognize the implications of key data, and in the new reporting procedures.					
3. Description: Accident assessment was done with hand calculations and, therefore, was slow. Recommendation: Provide the Department of Public Health with a computer terminal that can link up with the EOF's computer system to speed up accident assessment.	I.8				
4. Description: The State has not yet procured a supply of KI to be stockpiled in Concord for use by emergency workers. Recommendation: Purchase sufficient quantity of KI to meet state's needs for its emergency workers.	J.10.e				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
New Hampshire State Laboratory					
1. Description: Laboratory staff need additional training in order to develop an SOP for a complete environmental surveillance program, which includes the ability to obtain quantitative results from sample analysis and proper techniques for dealing with equipment operation characteristics. Recommendation: Arrange to have laboratory staff receive training at the Winchester Analytical and Engineering Center of the U.S. Food and Drug Administration (FDA) Laboratory in Winchester, Mass.	I.8				
2. Description: The laboratory does not have an adequate shield for its Ge(Li) detector (i.e., one with a cover) to reduce the background count rate and enable lab staff to make quantitative calculations. Recommendation: Procure this piece of equipment and obtain suitable training in its use at the Winchester FDA facility.	I.8				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Keene IFO					
1. Description: The Civil Defense communication system did not function adequately between the IFO and field-monitoring teams. Also, there was no backup radio system; commercial telephones were used if they were available. Recommendation: Problems with the communications system should be identified and remedied. An appropriate backup communication system also needs to be identified and tested.	F.1.d				
2. Description: The communications problems were instrumental in keeping meteorological information from reaching the teams in a timely manner, and the teams were not dispatched to proper monitoring locations as a result. Recommendations: Adequate procedures for communicating with the field teams should be developed.	I.8,I.11				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
3. Description: There were insufficient telephone lines (1) and no backup communications system to the Reception Center. Recommendations: Additional telephone lines and backup communication system to the Reception Center should be addressed.	P.1.d				
4. Description: EBS messages broadcast were not monitored. Recommendation: All EBS broadcasts should be routinely monitored, along with checking with local communities as to the functioning of the public-alert system.	E.5				
New Hampshire Field Monitoring					
1. Description: SOPs were not followed by field teams during offsite radiological monitoring. Recommendation: Train the offsite field teams to use and follow New Hampshire SOPs during radiological surveillance.	I.7,I.11				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
2. Description: The teams did not understand when to administer KI. Recommendation: Provide training to all organizational levels on criteria for authorizing KI administration to emergency workers.	J.10.e				
3. Description: Information provided to offsite teams from the IPO was cursory. Recommendation: Improve direction and control given to offsite monitoring teams so that they are kept apprised of any changes which could affect radiological monitoring.	F.1.d				
Chesterfield					
1. Description: There was not enough dosimetry equipment. Recommendation: The state should provide additional radiological monitoring equipment.	K.3.a				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Hinsdale					
1. Description: The Civil Defense radio used as the primary means of communicating with the IFO in Keene did not work properly. Recommendation: Find and rectify the cause of malfunction. See that radio checks are made before placing equipment in service.	F.1.b				
Swanzey					
1. Deficiency: Full staffing was never achieved; notably, radio was not monitored and several important transmissions were missed. Recommendation: The town should see that capability exists for 24 hour per day staffing of communication links. If necessary, assistance from the State should be requested.	I.e				

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Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Winchester					
1. Description: The Civil Defense radio did not work well in all instances. The EOC and field teams could not reach the IFO. Recommendation: The cause of malfunctions should be determined and periodic tests made to ensure that Civil Defense radio is reliable.	F.1.b				
Massachusetts State EOC					
1. Description: Although the "General Emergency" message notification was received by the State, it did not come through NAWAS and the State Police in accordance with the communication channel shown in the plan. There was no explanation available for this incident. It could have been an EOF, EOC, State Police, or utility lapse. Recommendation: The cause of the deviation from the warning-point system should be found, if possible, and steps taken to ensure the integrity of the warning-point system.	E.1				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
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Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Area IV EOC					
1. Description: [illegible] some problems (see Leyden [illegible]) early in the exercise with communications at some of the local EOCs. These were traced to inexperienced operators. Although backup systems worked, the primary means did not do so in every location 100% of the time. Recommendation: In an emergency situation, especially one involving wide participation of local communities, Area IV (or the State EOC) should see that a radio check is made to be sure that all parties are in communication.	P.1.b				
Bernardston					
1. Description: Updated public information brochures are said to have been distributed. However, none could be produced. This has been noted as a deficiency in previous exercises. Recommendation: Samples of public information brochures should be sent to FEMA Region I for evaluation.	G.2				

TABLE 2 Remedial Actions for Vermont Yankee Nuclear Power Plant
(April 17, 1985)

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2. Description: Although evacuation maps showing population by areas, access control points, and sector designation are in the plan, they were not shown on posted displays. This is a previous uncorrected deficiency. Recommendation: On at least one of the display maps in the EOC, show sector markings, populations, and access control points.	J.10.a, J.10.h, J.10.j				
3. Description: Permanent record exposure devices were not available. Recommendation: Ask the State to see that permanent record exposure devices are provided.	K.3.a				
4. Description: No one present was aware of the maximum allowable dose or of procedures for authorizing emergency workers to incur exposures exceeding the EPA PAGs. Recommendation: Provide additional training for all of the EOC staff.	K.4				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Cill					
1. Description: No permanent exposure record devices or record keeping forms were available. Little knowledge of exposure record keeping procedures, allowable exposure level, or procedures for getting permission to exceed PAGs was evident. Recommendation: The State should take whatever action is necessary to provide permanent exposure record devices, record keeping forms, and additional training in allowable exposure limits.	K.3.a, K.4				
2. Description: Displays did not contain all required information, such as population, access and traffic control points. No status board was available. Recommendation: Ask for State assistance, if necessary, in upgrading displays and instructions for their use.	J.10.a, J.10.b				

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(April 17, 1985)

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3. Description: No one is named as a relief for the dispatcher. Recommendation: Include the name of the person who will provide relief for the dispatcher and provide this person with adequate training.	A.2.a				
Leyden					
1. Description: Displays, such as a status board and maps while available, were not used. This deficiency was also noted in previous exercises. Recommendation: Improve the quality of displays and include such things as populations, access control points, relocation centers, and evacuation routes on them, and train the EOC workers in their use.	J.10.a, J.10.b				
2. Description: Because of the inadequate training of the EOC staff, the controller performed emergency response functions.	N.1				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Recommendation: Controllers should be instructed not to assist or prompt players. The State should follow its own procedures to provide assistance to communities that are not adequately staffed.					
Northfield					
1. Description: The status board was not kept up-dated, and displays lacked complete information. Recommendation: The status board should be used in future exercises and the information on displays improved.	J.10.a, J.10.b				
2. Description: Effectiveness of the new Civil Defense radio microwave system was diminished because of its location away from the EOC. Recommendation: A permanent location for the EOC should be established so that communications equipment can be permanently installed therein.	F.1.b				

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Warwick					
1. Description: Displays did not include all necessary information for ready reference. Recommendation: Although the total population of Warwick is only 603, the maps containing population distribution, relocation centers, and evacuation routes should be clearly posted. Space should be provided in the EOC for this purpose.	J.10.a, J.10.b,				
Emergency Operating Facility (EOF)					
1. Description: Communication procedures between the states and utility as given in their respective plans were not followed for the General Emergency Classification, which caused serious delays in official notification of state and local governments. (CATEGORY A DEFICIENCY).	E.1				

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Recommendation: Review, revise, and coordinate plans among all parties to develop a better system for notification of state decision makers of changes in emergency classification levels.					
2. Description: The utility did not provide states with meteorological data and plume-movement projections in a timely manner. Recommendation: Revise procedures so that meteorological and other pertinent data are provided to the states in a timely manner. Consider installing terminals in all state EOCs so that they can receive the computer-generated output.	I.8				
Media Center					
1. Description: The utility disseminated misleading and inaccurate public information, including protective action recommendations that could have conflicted with those recommended by State authorities. In a real incident, this would have confused the public.	C.4				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
Recommendation: The utility should revise its method of developing and issuing news releases to ensure accuracy of content. It should reconsider its policy of making public its protective action recommendations before the states have been notified and have had the opportunity to consider the recommendations and take appropriate action.					
2. Description: There was a lack of genuine coordination and cooperation between the utility and State PIOs. Utility news releases were issued without giving State PIOs the opportunity to review them for possible changes and comments. The utility PIO failed to keep State PIOs sufficiently briefed on a timely basis regarding plant status and the changing situation. Recommendation: The utility spokesperson should coordinate information flow with State PIOs, allowing them to review news releases for possible changes. The utility spokesperson should also brief State PIOs on a timely basis.	A.1.b, E.6,E.7, C.4				

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(April 17, 1985)

Deficiencies and RAC Recommendation for Corrective Action	FEMA-REP-1, Rev. 1, Element	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Response	Actual Completion Date
3. Description: The Media Center is still located in the EPZ, as is the designated backup Media Center. Recommendation: The Media Center and backup should be located outside of the EPZ.	G.3.a				

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
1.	The working space for command and control operations at the State EOC is inadequate and also requires a better physical layout to facilitate internal communications. (3.1.1.5)	2/18/82	N/A	4	-	H.3	Vermont	Relocation of State EOC from Mountpelier to Waterbury. Letter from Vermont (10/18/82) stating that the plans to relocate EOC are fine and state should provide a floor plan to FEMA.	Yes 9/21/83	Relocation of EOC facility was effective in improving emergency response activities.	C
2.	It is suggested that additional radio pagers or other comparable equipment be obtained to accelerate the alerting and the mobilization of state officials and EOC staff. (4.2.1.3)	2/18/82	N/A	1	1	F.1.e	Vermont		Yes 9/21/83 4/17/85	Additional radio pagers were obtained and used to alert EOC staff for the 1985 exercise. Using this system, the alerting was performed in a timely manner.	C
3.	Dedicated telephones with backup systems are needed to improve the flow of information from the state to the local EOCs and enhance the management of emergency operations. (4.2.1.4)	2/18/82	N/A		2	F.1.d	Vermont	Radio telephones installed to communicate with local EOC.	Yes 9/21/83 4/17/85	Radio telephone worked inconsistently. The radio telephone operation at the state EOC was improved during the 1985 exercise and is considered adequate.	C
4.	Dedicated telephones with backup systems are needed to improve the flow of information from the state to the local EOCs and enhance the management of emergency operations. (4.2.1.4)	2/18/82	N/A	5	2	F.1.d	Brattleboro	Radio telephones installed to communicate with State EOC.	Yes 9/21/83 4/17/85	Radio telephone did not work, backup system was used. The radio telephone operation was improved during the 1985 exercise. During one temporary malfunction, corrective action was taken.	C

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5. Dedicated telephones with backup systems are needed to improve the flow of information from the state to the local EOCs and enhance the management of emergency operations. (4.2.1.4)	2/18/82	N/A	5	2	F.1.d	Dummerston	Radio telephones installed to communicate with State EOC.	Yes 9/21/83	Radio telephones worked well.	C
6. Dedicated telephones with backup systems are needed to improve the flow of information from the state to the local EOCs and enhance the management of emergency operations. (4.2.1.4)	2/18/82	N/A	5	2	F.1.d	Guilford	Radio telephones installed to communicate with State EOC.	Yes 9/21/83 4/17/85	How system malfunctioned, backup via commercial phone line. During the 1985 exercise the radio telephone only worked occasionally. The back up commercial phone line was used when necessary.	I
7. Dedicated telephones with backup systems are needed to improve the flow of information from the state to the local EOCs and enhance the management of emergency operations. (4.2.1.4)	2/18/82	N/A	5	2	F.1.d	Vernon	Radio telephones installed to communicate with State EOC.	Yes 9/21/83	Radio telephone worked well.	C
8. Training and/or plan changes are suggested to improve the difficulties with the measurement of a zero detectable level of radiological contamination of human and animal foods. (4.2.1.9)	2/18/82	N/A	9,11	5	J.9	Vermont		4/17/85	Not an exercise objective and not demonstrated.	I

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9. Portable iodine samplers should be considered for the improvement of the state's radiological field monitoring capability. (4.2.1.12)	2/18/82	N/A	8	5	I.9	Vermont		Yes 9/21/83 4/17/85	 Only one of the two field monitoring teams for the 1985 exercise had instrumentation for detection of radioiodine.	I
10. Consideration should be given to relocating the state EOC to a facility with at least one large room, where the incident director's office could be located in a side room isolated from the EOC entrance and the noise of the radio network system. (4.2.1.6)	2/18/82	N/A	4	-	H.3	Vermont	Relocation of State EOC to a more adequate facility.	Yes 9/21/83	Effective in improving EOC operations.	C
11. A standby generator is advised to provide backup power supply for the communications equipment in use at the Windham County Sheriff's Office. (4.2.1.10)	2/18/82	N/A	5	2	F.2	Vermont	Two back-up diesel generators are on standby at the EOC.	No -- The use of the generators was not demonstrated. 9/21/83 4/17/85	It is apparent that the back-up generators would be sufficient in the event of a power blackout. The Windham County Sheriff's office did not participate in the 1985 exercise.	I
12. Map displays showing evacuation routes, relocation centers, and shelter areas should be developed for use at the Middlesex and Rockingham State Police Headquarters. (4.2.1.11)	2/18/82	N/A	4	-	J.10.a	Vermont		No 9/21/83 4/17/85	 The Middlesex and Rockingham State Police Headquarters did not participate in the 1985 exercise.	I

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13.	It is suggested that uncertainty factors be applied in the radiochemical analyses to improve the state's exposure control capabilities. (4.2.1.14)	2/18/82	N/A	7,20	-	I.8	Vermont		Yes 4/17/85	The laboratory report form for samples contains a notation for the calculation of the uncertainty of the measurement.	C
14.	Training of the EOC staff is suggested to ensure that decisions made at the state level are timely, accurate, and based on reliable data and advice from radiological health advisors at the EOF and the IFO. (4.2.1.13)	2/18/82	N/A	11,10	3	D.4	Vermont	Training was not observed.	Yes 9/21/83	Decisions were made accurately, effectively, and in a timely manner.	C
15.	It is suggested that future scenarios should allow for a more adequate exercise of recovery and reentry, and application of evacuation and decontamination procedures to a token or practice group of residents. (4.2.1.15)	2/18/82	N/A	29,35	-	N.3, N.5	Vermont	Scenario was written to provide more function for emergency personnel.	Yes 9/21/83	Two evacuations were ordered, access control was employed and there was generally more action for emergency personnel. Recovery and reentry and decontamination procedures were not demonstrated.	I
									4/17/85	Recovery/reentry and decontamination were not objectives of the 1985 exercise and were not demonstrated.	

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16.	The Incident Field Office (IFO) in Brattleboro is inadequate to handle actual emergency operations. This facility is presently located within the 10-mile EPZ and needs to be relocated at a greater distance from the plant or hardened to provide habitability, and eliminate the need for evacuation in the event that protective actions become necessary, or provisions need to be made for an alternate IFO. (3.1.1.6)	2/18/82	N/A	4	-	H.2	Vermont	No action has been taken. From a letter from Vermont (10/18/82): Provision for an alternate IFO is already a part of Vermont's Plan. They are examining the feasibility of relocating the primary IFO. From a letter to Vermont (12/21/82): FEMA is pleased to learn that there are plans to relocate the IFO outside the 10-mile EPZ.	Yes 9/21/83 4/17/85	IFO is still located in Brattleboro within the 10-mile EPZ. IFO is still located in Brattleboro within the 10-mile EPZ.	I
17.	A direct telephone line is needed to improve the timeliness and flow of information between the IFO and the EOF. (4.2.1.5)	2/18/82	N/A	5	2	F.1.d	Vermont		Yes 9/21/83	The addition of a dedicated telephone line was not observed, however communications with the State EOC were effective.	C
18.	Training, equipment (in the form of dedicated vehicles), and modifications to the Brattleboro local emergency response plan are needed to improve methods for protecting mobility-impaired persons. (4.2.2.1)	2/18/82	N/A	16	7	J.10.d	Brattleboro	Brattleboro plan updated.	Yes 9/21/83	Updated plan includes list of mobility-impaired persons and specific vehicles to assist in an evacuation.	C

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Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
19. Additional personnel are needed at the Dummerston EOC to insure the capability for 24-hour continuous emergency operations, including 24-hour staffing of communications links. (3.1.2.8)	2/18/82	N/A	2	3	A.1.e	Dummerston	List of staff roster to continue a 24-hour response was posted in the EOC. From a Vermont letter (10/18/82): the capability for 24-hour staffing of the communication's link during an emergency operation is available.	Yes 9/21/83	From a letter to Vermont from FEMA (12/21/82): the capability to provide a 24-hour operation is now a corrected deficiency. There are no provisions for 24-hour operations available. The use of the back-up emergency staff was not demonstrated.	C
20. Maps showing evacuation routes, relocation centers, and population distribution need to be developed for use in the Dummerston EOC. (4.2.2.10)	2/18/82	N/A	4	-	J.10.e, J.10.h	Dummerston	Maps showing evacuation routes and population distribution centers were available at the EOC.	Yes 9/21/83	Evacuation routes and population distribution data were available for quick referral.	C
21. Additional radio pagers or other equipment are needed at the Dummerston EOC to back up the land-line telephones, which are presently the only means of initially alerting the emergency response personnel and to communicate with mobile medical support facilities. (4.2.2.4)	2/[illegible]/82	N/A	1	1	F.1.e, F.2	Dummerston	No action has been taken. Radio pagers or other communication systems are not available to assist the primary telephone lines.	Yes 9/21/83 4/17/P[illegible]	Communications used for alerting and mobilization of emergency personnel and mobile medical support facilities is without a back-up system. Radio pagers have been supplied to all EOC personnel and to volunteer firemen. These were used for the 1985 exercise.	C

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
22.	Training, additional personnel, and plan modifications are needed at Marlboro to provide acceptable means for alerting the transient population and persons outside or away from tone alert radios. (3.1.2.8)	2/18/82	N/A	13,14	4	J.10.c	Marlboro	Town of Marlboro has been relieved of emergency reponse requirements. State will cover Marlboro in event of accident. Town does not participate.	No 9/21/83 4/17/85		I
23.	Actions to protect the public are not included as part of the Marlboro local plan. Such a program should be developed, and staff need to be trained in the various aspects of public protection. (3.1.2.9)	2/18/82	N/A	12,15 17,18 19	6	J.2, J.9, J.10, J.12	Marlboro	Town of Marlboro has been relieved of emergency response requirements. State will cover Marlboro in event of accident. Town does not participate.	No 9/21/83 4/17/85		I
24.	Relocation Centers need to be identified in the Marlboro emergency response plan. (4.2.2.10)	2/18/82	N/A	27,28	7	J.10.a J.10.b	Marlboro	Town of Marlboro has been relieved of emergency response requirements. State will cover Marlboro in event of accident. Town does not participate.	No 9/21/83 4/17/85		I
25.	Training in the technical evaluation of accident assessment information at the Brattleboro EOC is advised to insure rapid assessment of the magnitude and location of radiological hazards to the public. (4.2.2.2)	2/18/82	N/A	7,8,9	5	I.8	Brattleboro		Yes 9/21/83 4/17/85	Emergency personnel are not sufficiently trained to accurately evaluate accident assessment information. Observations at 1985 exercise indicate emergency personnel are still insufficiently trained to evaluate accident assessment information.	I

TABLE 1: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
26.	Training in the use of KI for emergency workers and in personnel decontamination is advise for the Brattleboro EOC. (4.2.2.3)	2/18/82	N/A	21	6	J.10.e K.5.b	Brattleboro	Potassium iodide is available to EOC emergency personnel.	No 9/21/83	Potassium iodide is available but was not authorized for use during this exercise.	I
									4/17/85	Potassium iodide was not available during 1985 exercise and emergency workers were not knowledgeable about its use.	
27.	Future exercise scenarios should be devised to more adequately test emergency response capabilities at the Dummerston EOC. (4.2.2.5)	2/18/82	N/A	-	-	N.1.a	Vermont/ Dummerston	There was little improvement in the scenario.	Yes 9/21/83	The exercise scenario was still ineffective at adequately testing the emergency capabilities of the EOC.	C
									4/17/85	The EOC was more involved in the 1985 exercise than in previous exercises.	
28.	Backup radio communications equipment is suggested to complement the land-line telephones, which are currently the only means of notifying the Guilford EOC staff.	2/18/82	N/A	1,5	1,2	F.1.e	Guilford	Installation of radio telephone to provide primary communication.	Yes 9/21/83	Malfunctioning radio telephones were backed up by commercial phone lines.	I
									4/17/85	The primary radio system again did not function well for the 1985 exercise. Back-up system was used.	
29.	Maps showing evacuation routes and relocation centers should be developed for use in the Guilford EOC. Decontamination centers also need to be identified in the Guilford emergency response plan. (4.2.2.8 and 4.2.2.10)	2/18/82	N/A	4	-	J.10.a J.10.h	Guilford	Evacuation routes and access control points were added to town map.	Yes 9/21/83	Evacuation routes and access control points are available for quick referral. Maps showing relocation centers were not posted. Traffic congestion and decontamination centers are still unaddressed in plan.	I

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
									4/17/85	Maps showing relocation centers were available for the 1985 exercise. However, the Guilford plan was not available at the EOC and it could not be determined if the plan presently addresses traffic congestion and decontamination centers.	
30.	On-the-job training in the care and use of dosimeters is advised to improve the 24-hour capability to determine the doses received by emergency personnel at the Guilford EOC. (4.2.2.8)	2/18/82	N/A	20	6	K.3.a	Guilford		Yes 9/21/83	EOC staff were not properly trained in the use of dosimetry equipment and lacked knowledge of maximum doses.	I
									4/17/85	Observations made during the 1985 exercise indicate EOC staff still lacks sufficient training.	
31.	Provisions for accident assessment are not included in the Marlboro plan. Training and plan review are suggested. (4.2.2.9)	2/18/82	N/A	7,8	5	H.7	Marlboro	Town of Marlboro has been relieved of emergency response requirements. State will cover Marlboro in event of accident. Town does not participate.	No 9/21/83 4/17/85		C
32.	Maps showing evacuation routes and relocation centers need to be developed for use in the Marlboro EOC. Relocation centers also need to be identified in the Marlboro emergency response plan. (4.2.2.10)	2/18/82	N/A	4	-	J.10.a, J.10.h	Marlboro	Town of Marlboro has been relieved of emergency response requirements. State will cover Marlboro in event of accident. Town does not participate.	Yes 9/21/83 4/17/85		C

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
33. Training is suggested to improve the notification and prompt instruction of the public regarding protective actions that are to be taken in Vernon. (4.2.2.11)	2/18/82	N/A	13,14	1,4	E.6	Vernon		Yes 9/21/83	It is not apparent if any remedial actions were taken to improve notification and instruction to the public. However, there were no difficulties noted in this area.	C
34. The state capability for accident assessment is lacking in New Hampshire. Offsite radiological monitoring equipment is needed at the state EOC. A central point for the collection and evaluation of field team samples, including radioiodine concentrations in the plume EPZ, needs to be developed. Training, planning, and resources are needed to improve the New Hampshire accident assessment capabilities. (3.2.1.10)	2/18/82	N/A	7,8,9 10,11	5	H.7 H.12 I.7-I.11	New Hampshire	Upgrading of the accident assessment capabilities includes: obtaining monitoring equipment, increasing the number of people available, providing training programs, and expanding the use of available laboratory facilities. (Letter from N.H. 9/28/82.)	Yes 9/21/83	Emergency workers at the EOC were better prepared to handle accident assessment. Field monitoring teams are still in need of additional equipment. No reference was made to location of a central point for collection of field team samples.	I
								4/17/85	No reference was made to a central location point for collection of field samples.	
35. Health, medical and exposure control capabilities need to be improved at the state EOC. Training and planning are needed to improve what appear to be seriously deficient capabilities to determine emergency worker exposures on a 24-hour basis, and to periodically estimate total population exposure. (3.2.1.11)	2/18/82	N/A	20,30 34	7	J.10.f, K.3.a, K.3.b M.4	New Hampshire	Upgrading of capabilities is being accomplished through joint efforts of three agencies: Civil Defense Agency, Division of Emergency Medical Services and the Division of Public Health Services. Dosimetry is being upgraded, record keeping is being improved and plans for providing emergency medical services are being improved. Improvements	Yes 9/21/83	Additional supplies of KI are still needed. Dosimetry equipment is needed for emergency personnel. Provisions for mobile medical teams to transport radiological accident victims were not observed.	I

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
							will be reflected in the RERP and in the emergency response procedures for each agency. Changes in plans and procedures will be accompanied by related training. (Letter from N.H. 9/28/82.)	4/17/85	Dosimetry equipment and supplies of KI were available to emergency workers at the IPO during the 1985 exercise. Mobile medical support teams were not observed during this exercise.	
36. Map displays in the operations room at the state EOC need to be improved and more prominently displayed for use in briefing the Governor about the direction and control of emergency response functions. (4.3.1.2)	2/18/82	N/A	4	-	H.3 J.10.a	New Hampshire	Appropriate maps and displays have been posted.	Yes 9/21/83	The efficiency in briefing the Governor has been improved.	C
37. Training is suggested to improve the verification of messages received by and sent from the New Hampshire State EOC. (4.3.1.3)	2/18/82	N/A	3,5	2	E.1	New Hampshire		Yes 9/21/83 4/17/85	Verification procedures were adequate during the 1985 exercise. All outside calls received on non-secure channels were verified.	C
38. Training is advised to insure that decisions for taking emergency action are based directly on communications received from the IPO and radiological monitoring teams. (4.3.1.4)	2/18/82	N/A	3	3	F.1.d	New Hampshire		Yes 9/21/83 4/17/85	Good communications capabilities with the IPO and with monitoring teams were demonstrated during the 1985 exercise.	C

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
39. Consideration should be given to stockpiling potassium iodide (KI) to minimize the potential need to borrow from the inventories of neighboring states. (4.3.1.6)	2/18/82	N/A	21	6	J.10.e	New Hampshire		Yes 9/21/83 4/17/85	Additional supplies of KI are needed. During the 1985 exercise, it was learned that although the state now plans to stockpile 2000 doses of KI in Concord, it still has no definite schedule for obtaining its own supply of KI.	I
40. Health, medical, and exposure control measures were weak at the Chesterfield EOC. Formal and on-the-job training, along with a review of plan content, would improve control of access to evacuated areas, adequacy and frequency of emergency worker dosimeter readings, and maintenance of exposure records. A review and/or modification of the emergency response plans would improve the capabilities for exposure control and to determine if decontamination is needed for emergency workers. (3.2.2.12)	2/18/82	N/A	17,20 29	6,7	J.10.j K.3.b K.4 K.5.a K.5.b	Chesterfield	Dosimetry and related record-keeping for emergency workers from each of the towns within the EPZ are being upgraded. Local emergency workers will be offered training in exposure control measures. (Letter from H.H. 9/28/82.)	Yes 9/21/83	Radiological exposure control procedures were adequately demonstrated. RADEF Officer was very knowledgeable. Verbal and written instructions were issued to emergency workers when they received dosimeters and records were kept.	C

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
41.	Emergency operations facilities and resources at the Richmond EOC were considered weak. Working space, amenities, and internal communications need to be improved. Communications needs to be improved with radio scanners and formal and on-the-job training of EOC personnel to operate radios. (3.2.2.13)	2/18/82	N/A	4,5	2	F.1.b F.1.d H.3 J.10.a J.10.b	Richmond	Maps and displays are posted as required. A new Civil Defense radio was installed at the EOC. Physical facilities, internal communications and security remained unchanged. "No plans have been made to upgrade the Richmond EOC itself. The town has no alternate facility it can consider." (Letter from M.M. 9/28/82.)	Yes 9/21/83	Pertinent maps and displays are available for easy reference. Communications were a problem throughout the exercise because the Civil Defense radio did not function properly.	C
									4/17/85	Facilities, maps, displays, and communications were all observed to be adequate during the 1985 exercise. A new CD radio had been installed and appropriate training provided to several fire and rescue squad personnel.	
42.	Emergency operations facilities and resources at Swanzey EOC were weak. Working space, amenities, internal communications, and security need to be improved. A map showing the distribution of population by evacuation area sectors also needs to be displayed. (3.2.2.14)	2/18/82	N/A	4	-	H.3 J.10.a J.10.b	Swanzey	Maps and displays are posted as required. A new Civil Defense radio was installed at the EOC. Physical facilities, internal communications and security remained unchanged.	Yes 9/21/83	Pertinent maps and displays are available for easy reference. A population distribution map is still missing. Communications were a problem throughout the exercise because the Civil Defense radio did not function properly.	C
									4/17/85	The emergency facilities were improved for the 1985 exercise. A population map was available and the Civil Defense radio functioned adequately.	

TABLE 3: DEFICIENCY-TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
43.	Emergency operations management at the Swanzey EOC needs improvement. A specific individual needs to be in charge of the EOC; the use and function of the emergency classification system was not well known; and adequate written procedures that provide for emergency actions to be taken which are consistent with actions recommended by the state need to be implemented. (3.2.2.15)	2/18/82	N/A	3,4	3	A.1.d D.3 D.4	Swanzey	No actions were observed. However, there had obviously been some training of the EOC personnel. From a letter from N.H. (9/28/82): The State REPP is being revised, the town plans and the emergency response procedures are being reviewed and revised as necessary.	Yes 9/21/83	The Civil Defense director was effectively in charge of the EOC operation and received adequate support from a knowledgeable staff.	C
44.	Emergency operations facilities and resources at the Chesterfield EOC need improvement in security, communications, working space, and maps showing population distribution and evacuation routes. (4.3.2.1)	2/18/82	N/A	4	-	A.2.a H.3 J.10.a J.10.b F.1 F.1.b	Chesterfield	Addition of maps and displays. A Civil Defense radio system was installed. EOC locations were changed in Chesterfield.	Yes 9/21/83	Chesterfield had all displays and maps except population distribution. The Civil Defense radio was inoperative. Facilities at Chesterfield are adequate. Security measures remained as in the previous exercise.	C
									4/17/85 -	Facilities and resources were improved for the 1985 exercise and are considered adequate. Several redundant radio systems were available and provided continuous radio communications.	

TABLE 3. DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
45. Emergency operations facilities and resources at the Hinsdale EOC need improvement in security, communications, working space, and maps showing population distribution and evacuation routes. (4.3.2.1)	2/18/82	N/A	4	-	A.2.a H.3 J.10.a J.10.b F.1 F.1.b	Hinsdale	Addition of maps and displays. A Civil Defense radio system was installed.	Yes 9/21/83	Hinsdale had all displays and maps except population distribution. The Civil Defense radio was inoperative. EOC facilities remained unchanged. Security measures remained as in previous exercise.	C
								4/17/85	Security and working space were adequate for the 1985 exercise. Population distribution map is part of the Hinsdale plan and was available in the EOC. Radio communication is described in Issue Description #114 (2.2.5.2.1).	
46. Emergency operations facilities and resources at the Winchester EOC need improvement in security, communications, working space, and maps showing population distribution and evacuation routes. (4.3.2.1)	2/18/82	N/A	4	-	A.2.a H.3 J.10.a J.10.b F.1 F.1.b	Winchester	Addition of maps and displays. A Civil Defense radio system was installed.	Yes 9/21/83	Winchester had all required displays and maps. The Civil Defense radio was inoperative. The Winchester EOC facilities remained unchanged. Security measures remained as in the previous exercise.	I
								4/17/85	The facilities and security at the EOC were considered adequate for the 1985 exercise. However, the Civil Defense radio continued to be an unreliable means of communication.	

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
47.	Capability for 24-hour initial and continuous emergency response for alerting and mobilization of officials and staff at the Richmond EOC would be improved with additional on-the-job training and equipment. (4.3.2.2)	2/18/82	N/A	1,2	1	A.1.a A.4	Richmond		Yes 9/21/83	There was no change observed for a 24-hour initial or continual response at the Richmond EOC.	C
									4/17/85	At the 1985 exercise the staff adequately described how extended 24-hour operations would be implemented.	
48.	Communication equipment would improve prompt activation of the Hinsdale EOC. The ability to communicate with fixed and mobile medical support facilities would be improved at the Hinsdale EOC with establishment of procedures in the local plan. (4.3.2.2)	2/18/82	N/A	5	2	F.1.a F.1.e F.2	Hinsdale		Yes 9/21/83	Observers noted that communication procedures were adequate for the initial response for activation. Emergency personnel live relatively close to EOC so notification was no problem. It was not observed if the ability to communicate with medical support facilities has been added to the plan.	C
									4/17/85	During the 1985 exercise it was established that the EOC can communicate with fixed and mobile medical support facilities including the local ambulance service, the Brattleboro, Vermont Hospital, and the Bureau of Emergency Medical Services at the State EPO. (See pp. 2-4 of Hinsdale plans; 12/15/84 revision).	

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

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49.	Additional personnel would improve timely and efficient activation of the Swanzey EOC. (4.3.2.2)	2/18/82	N/A	1	1	E.1 E.2	Swanzey		Yes 9/21/83	There was no observation noted concerning additional personnel at the Swanzey EOC.	C
									4/17/85	During the 1985 exercise the Swanzey EOC demonstrated the ability to promptly activate the EOC in an efficient manner.	
50.	At the Winchester EOC, an individual needs to be placed in charge of emergency response operations. A review of the emergency classification system at the Winchester EOC is suggested. (4.3.2.3)	2/18/82	N/A	3	3	A.1.d F.1	Winchester	It was not officially observed, but apparently training of the EOC director occurred.	Yes 9/21/83	The EOC was effectively managed by the Civil Defense director and the Police Chief. A review of the emergency classification system was not observed.	C
									4/17/85	During the 1985 exercise the EOC was observed to be very effectively managed.	
51.	Coordination of the EOC staff at Chesterfield would be improved through briefings and staff meetings. (4.3.2.3)	2/18/82	N/A	3	3	A.1.d F.1	Chesterfield	The director held briefings and discussed proposed actions with the staff.	Yes 9/21/83	The operation at Chesterfield was effective and efficient with the addition of staff meetings and briefings.	C
52.	New dosimeters and formal and on-the-job training are needed at the Hinsdale EOC to determine dosages received by emergency workers. (4.3.2.4)	2/18/82	N/A	20	6	K.3.a K.3.b	Hinsdale	Addition of permanent-record, low-, mid- and high-range dosimeters, instruction and log sheets.	Yes 9/21/83	Sufficient dosimeters are available along with instruction to use and understand them.	C
53.	According to Hinsdale and Chesterfield participants, the exercise did not allow those EOCs to demonstrate evacuation capabilities. (4.3.2.5)	2/18/82	N/A	-	-	N.1.a	Hinsdale Chesterfield	Scenario written to include evacuation of Chesterfield and Hinsdale.	Yes 9/21/83	Both EOCs were active during the exercise demonstrating evacuation procedures.	C

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
54.	Winchester participants were not tested on all parts of the plan. (4.3.2.5)	2/18/82	N/A	-	-	N.1.a	Winchester		Yes 9/21/83 4/17/85	Participants in Winchester were not tested on all parts of the plan.	I
55.	The Bernardston plan needs to be modified to include a PAG table so that dose rates communicated from the state have more meaning to the local officials. (4.4.2.4)	2/18/82	N/A	11	6	K.5.a	Bernardston		Yes 9/21/83 4/17/85	During the 1985 exercise it was observed that the PAG table has not yet been added to the Bernardston plan.	I
56.	The Gill plan, which was in preparation at the time of the exercise, apparently does not provide for any means of alerting the Mount Hermon Private School other than through the volunteer schools representative at the EOC. Additional equipment in the form of NOAA tone-alert radios are needed to complement the present system, which may not be satisfactory to alert the resident population at the school. (3.3.2.16)	2/18/82	N/A	13,19	1,6	E.6	Gill		Yes 9/21/83 4/17/85	At the 1985 exercise it was established that all schools within Gill's part of the EPZ are equipped with the tone alert radios. The Gill plan does not include measures for Mount Herman; the Mount Herman plan is a separate document.	I
57.	Appropriate documentation of incoming messages from the state EOC would improve transfer of information to the local EOCs. Also, the information should be promptly posted on a status boards. (4.4.1.2)	2/18/82	N/A	3,5 4	2,3	D.4 F	Massachusetts		Yes 9/21/83 4/17/85	Corrective action was implemented by the Area IV EOC at the August 1984 Yankee Rowe exercise.	C

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

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58.	The map showing evacuation routes and population distribution at the Bernardston EOC could be improved by including the state's alphabetical sector designations on this display. This modification would facilitate the interpretation and location of radiological hazards information provided by the state. (4.4.2.1)	2/18/82	N/A	4	-	J.10.a	Bernardston	A map showing evacuation routes and population distribution was posted.	Yes 9/21/83 4/17/85	It is unclear if this map included state sector designations. A composite map showing the sector designations was not posted during the 1985 exercise.	I
59.	Public information brochures should be considered to inform residents on differentiation between the fire and radiological alert functions of the Bernardston fire sirens. (4.4.2.2)	2/18/82	N/A	-	4	E.6 G.2	Bernardston		Yes 9/21/83 4/17/85	At the 1985 exercise the EOC Director indicated that public information material had been issued in late 1984. However, since a copy was not available, this could not be verified.	I
60.	Provisions should be made to assure the availability of operable batteries for radiation detection instruments at the Bernardston EOC. (4.4.2.1)	2/18/82	N/A	7	5	K.3.a	Bernardston		Yes 9/21/83 4/17/85	At the 1985 exercise it was observed that rechargeable batteries were now available at the EOC.	C

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61.	Additional radio pagers should be assigned to key EOC staff at Gill as well as to the first and second selectman. (4.4.2.5)	2/18/82	N/A	1	1	E.2	Gill		Yes 9/21/83	Backup notification system is needed to compliment the telephones.	I
									4/17/85	During the 1985 exercise it was observed that additional radio pagers are still needed for the selectmen and for police and highway department staff.	
62.	Additional planning and training at the Gill EOC would improve understanding of the Massachusetts policy regarding the issuance of KI to emergency workers. (4.4.2.6)	2/18/82	N/A	21,22	6	J.10.e	Gill		Yes 9/21/83 4/17/85	During the 1985 exercise the emergency response staff had no KI and no guidelines regarding its use.	I
63.	A status board for briefing police, fire, and other support service organizations is advised to improve the emergency operation management capabilities at the Greenfield EOC. (4.4.2.7)	2/18/82	N/A	4	-	I.8	Greenfield		Yes 9/21/83 4/17/85	A status board was used for the 1985 exercise, and was updated in a timely manner.	C
64.	Additional personnel trained in communications, in EOC operations, and in the local plan are needed to insure continuous 24-hour operations at the Greenfield EOC. (4.4.2.8)	2/18/82	N/A	5	2	A.4	Greenfield		Yes 9/21/83 4/17/85	In addition to the qualified personnel present at the EOC during the 1985 exercise, a written listing of backup personnel was available reflecting the capability for continuous 24-hour operations.	C

TABLE 3: DEFICIENCY TRACKING TABLE
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65.	A public information program should be devised to differentiate the fire and radiological alert functions of the Leyden fire sirens. (4.4.2.9)	2/18/82	N/A	-	-	E.6 G.2	Leyden		No 9/21/83 4/17/85	At the 1985 exercise the EOC staff indicated that the pitch on the available sirens cannot be changed to differentiate between a fire alert and a radiological alert.	I
66.	The Media Center is presently located inside the 10-mile plume exposure EPZ. The facility needs to be relocated to a more remote location or a suitable alternate (backup) facility needs to be provided. (3.1.1.1)	2/18/82	N/A	4	-	G.3.b	Vermont	It is Vermont's understanding that providing for a Media Center is a responsibility of the utility. (From a letter from Vermont 10/18/82.) From a letter from FEMA (12/21/82); FEMA still suggests that Vermont develop an arrangement with its neighboring states and the utility for an alternative media center.	Yes 9/21/83 4/17/85	Media Center is still within the 10-mile EPZ. The Media Center at Dalen's Chalet for the 1985 exercise is still within the 10-mile EPZ.	I
67.	Improved Tri-state coordination is needed to insure that both communications equipment and procedures are in place to facilitate the implementation of emergency response decisions that are compatible among the three states. (3.1.1.4)	2/18/82	N/A	5,3 4	2,3	F.1.b	Vermont	Vermont is satisfied that they can sufficiently coordinate with the other two states. If there is any question regarding coordination it would not involve equipment but the philosophy with the 3 states regarding the timeliness of decisions and resulting actions. (Letter from Vermont 10/18/82.)	Yes 9/21/83 4/17/85	During the 1985 exercise the Tri-State coordination was observed to be adequate, both in terms of communications equipment and procedures.	C

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68.	A state spokesperson who would have access to all necessary information needs to be trained in obtaining and verifying information disseminated by the utility at the Media Center and the release of this information to the local media. (4.2.1.8)	2/18/82	N/A	25	4	G.4.a	Vermont		Yes 9/21/83 4/17/85	The spokesperson representing the Governor at the Media Center during the 1985 exercise was observed to be well informed and capable of obtaining and relaying relevant information.	C
69.	Consideration should be given to the installation of dedicated telephone lines so that the Governor of Vermont could reach the Governors of New Hampshire and Massachusetts without delay. (4.2.1.1)	2/18/82	N/A	5	2	F.1.b	Vermont		Yes 9/21/83 4/17/85	During the 1985 exercise the dedicated microwave phone line (WESCOM) was observed to be installed and operating. This dedicated line links Vermont, New Hampshire, Massachusetts, and the utility.	C
70.	Vermont officials should meet with the utility and officials of New Hampshire and Massachusetts to develop map displays and status boards for the EOF and IPO that are mutually acceptable to all three states. These displays should show evacuation routes, evacuation areas, preselected radiological sampling monitoring points, and relocation centers in host areas and shelter areas. (4.2.1.7)	2/18/82	N/A	4	-	J.10.a	Vermont		Yes 9/21/83 4/17/85	For the 1985 exercise the maps available at the EOF were judged to be adequate for the functions carried out by EOF personnel.	C

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71.	The EOF needs to be moved to a more remote location outside the 10-mile EPZ. Also, additional working space is needed at this facility. (3.1.1.2)	2/18/82	N/A	4	-	H.2 H.3	Vermont	From a letter from Vermont (10/18/82): It is Vermont's understanding that the location of the EOF is a responsibility of the utility. From a FEMA letter to Vermont (12/21/82): FEMA feels that as the EOF is where state radiological health personnel assess radiological information pertinent to the State's protective action decision making, they feel it is incumbent upon the state to assume the safety of their personnel.	Yes 9/21/83 4/17/85	The EOF is still located within the 10-mile EPZ. There is now sufficient area for use by state emergency personnel. The EOF was still located within the 10-mile EPZ at the 1985 exercise. However, it is understood that a new EOF, which will meet NRC requirements, is presently under construction.	I
72.	The capability for continuous 24-hour response of the EOF needs to be improved. (3.1.1.3)	2/18/83	N/A	2	3	A.4	Vermont	Vermont believes that necessary backup people who have appropriate training for 24-hour operation are available at the EOF. (Letter from Vermont 10/18/82.)	Yes 9/21/83 4/17/85	At the 1985 exercise the availability of additional trained personnel was judged adequate to assure capability for continuous 24-hour operations.	C
73.	The Media Center is presently located inside the 10-mile plume exposure EPZ. The facility needs to be relocated to a more remote location or a suitable alternate (backup) facility needs to be provided. (3.2.1.1)	2/18/82	N/A	4	-	G.3.b	New Hampshire	Letter from State: "The choice of location for the media center was made by the utility. The State of New Hampshire feels that it is not appropriate for FEMA to cite that location as a significant deficiency for correction by the State." (Letter from New Hampshire 9/28/82.)	Yes 9/21/83 4/17/85	Media Center is still within the 10-mile EPZ. The Media Center at Dalem's Chalet for the 1985 exercise is still within the 10-mile EPZ.	I

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74.	Improved Tri-state coordination is needed to insure that both communications equipment and procedures are in place to facilitate the implementation of emergency response decisions that are compatible among the three states. (3.2.1.4)	2/18/82	N/A	5 3,4	2,3	F.1.b	New Hampshire	Meeting with 3 states on 9/14/82 to discuss issue. Additional meetings will be held in the future. New Hampshire expects that procedures for improved coordination will result from meetings in time for the 1983 exercise. (Letter from N.H. 9/28/82.)	Yes 9/21/83 4/17/85	During the 1985 exercise the Tri-State coordination was observed to be adequate, both in terms of communications equipment and procedures.	C
75.	A state spokesperson who would have access to all necessary information needs to be trained in obtaining and verifying information disseminated by the utility at the Media Center and the release of this information to the local media. (4.3.1.7)	2/18/82	N/A	25	4	G.4.a	New Hampshire		Yes 9/21/83 4/17/85	During the 1985 exercise New Hampshire was observed to be represented by a qualified, informed, and capable spokesperson.	C
76.	Consideration should be given to the installation of dedicated telephone lines so that the Governor of New Hampshire could reach the Governors of Vermont and Massachusetts without delay. (4.3.1.1)	2/18/82	N/A	5	2	F.1.b	New Hampshire		Yes 9/21/83 4/17/85	During the 1985 exercise the dedicated phone line was observed to be installed and operating. This line links New Hampshire, Vermont, Massachusetts and the utility.	C

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77.	New Hampshire officials should meet with the utility and officials of Vermont and Massachusetts to develop map displays and status boards for the EOF and IFO that are mutually acceptable to all three states. These displays should show evacuation routes, evacuation areas, preselected radiological sampling and monitoring points, and relocation centers in host areas and shelter areas. (4.3.1.5)	2/18/82	N/A	4	-	J.10.a	New Hampshire		Yes 9/21/83 4/17/85	For the 1985 exercise the maps available at the EOF were judged to be adequate for the functions carried out by EOF personnel.	C
78.	The EOF needs to be moved to a more remote location outside the 10-mile EPZ or an alternate EOF needs to be provided. Also, additional working space is needed at this facility. (3.2.1.2)	2/18/82	N/A	4	-	H.2	New Hampshire	No action has been taken to relocate the EOF. The EOF was arranged to provide more working space. "The EOF is a utility responsibility, as indicated in NUREG... Any deficiency that may apply to the location of the EOF should be addressed to Vermont Yankee, not to the State of New Hampshire..." (From letter from New Hampshire 9/28/82.)	Yes 9/21/83 4/17/85	The EOF is still within the 10-mile EPZ. There is now sufficient area for use by state emergency personnel. The EOF was still located within the 10-mile EPZ at the 1985 exercise. However, it is understood that a new EOF, which will meet NRC requirements, is presently under construction.	I
79.	The capability for continuous 24-hour response of the EOF needs to be improved. (3.2.1.3)	2/18/82	N/A	2	3	A.4	New Hampshire	The State's RERP and the emergency response procedures for the Division of Public Health are being revised. (Letter from New Hampshire 9/28/82.)	Yes 9/21/83 4/17/85	At the 1985 exercise the availability of additional trained personnel was judged adequate to ensure capability for continuous 24-hour operations.	C

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80.	The Media Center is presently located inside the 10-mile plume exposure EPZ. The facility needs to be relocated to a more remote location or a suitable alternate (backup) facility needs to be provided.	2/18/82	N/A	4	-	G.3.b	Massachusetts	See comments from #66 (New Hampshire) and #73 (Vermont).	Yes 9/21/83 4/17/85	Media Center is still within the 10-mile EPZ. The Media Center at Dalem's Chalet for the 1985 exercise is still within the 10-mile EPZ.	1
81.	Improved Tri-state coordination is needed to insure that both communications equipment and procedures are in place to facilitate the implementation of emergency response decisions that are compatible among the three states. (3.3.1.4)	2/18/82	N/A	5,3,4	2,3	F.1.b	Massachusetts		Yes 9/21/83 4/17/85	During the 1985 exercise the Tri-State coordination was observed to be adequate, both in terms of communications equipment and procedures.	C
82.	A state spokesperson who would have access to all necessary information needs to be trained in obtaining and verifying information disseminated by the utility at the Media Center and the release of this information to the local media. (4.4.1.4)	2/28/82	N/A	25	4	G.4.a	Massachusetts		Yes 9/21/83 4/17/85	During the 1985 exercise Massachusetts was observed to be represented by a qualified, informed, and capable spokesperson.	C
83.	Consideration should be given to the installation of dedicated telephone lines so that the Governor of Massachusetts could reach the Governors of Vermont and New Hampshire without delay. (4.4.1.1)	2/28/82	N/A	5	2	F.1.b	Massachusetts		Yes 9/21/83 4/17/85	During the 1985 exercise, the dedicated phone line was observed to be installed and operating. This dedicated line links Massachusetts, Vermont, New Hampshire, and the utility.	C

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84.	Massachusetts officials should meet with the utility officials of Vermont and New Hampshire to develop map displays and status boards for the EOF and IFO that are mutually acceptable to all three states. These displays should show evacuation routes, evacuation areas, preselected radiological sampling and monitoring points, relocation centers in host areas and shelter areas. (4.4.1.3)	2/28/82	N/A	4	-	J.10.a	Massachusetts		Yes 9/21/83 4/17/85	For the 1985 exercise the maps available at the EOF were judged to be adequate for the functions carried out by EOF personnel.	C
85.	The EOF needs to be moved to a more remote location outside the 10-mile EPZ. Also, additional working space is needed at this facility. (3.3.1.2)	2/28/82	N/A	4	-	H.2 H.3	Massachusetts	No action has been taken to relocate the EOF. The EOF was arranged to provide more working space.	Yes 9/21/83	The EOF is still within the 10-mile EPZ. There is now sufficient area for use by state emergency personnel.	I
									4/17/85	The EOF was still located within the 10-mile EPZ at the 1985 exercise. However, it is understood that a new EOF, which will meet NRC requirements, is presently under construction.	
86.	The capability for continuous 24-hour response of the EOF needs to be improved. (3.3.1.3)	2/28/82	N/A	2	3	A.4	Massachusetts		Yes 9/21/83 4/17/85	At the 1985 exercise the availability of additional trained personnel was judged adequate to ensure capability for continuous 24-hour operations.	C

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87.	The Brattleboro EOC did not receive notice from the State EOC to evacuate in a timely manner. Thus, Brattleboro's protective response activities could not be implemented because the Brattleboro EOC was notified of the evacuation over EBS at the same time as the public. (2.1.1.1)	9/21/83		13,15,	8	J.9	Vermont	An additional staff member will act as local government and facility coordinator.	Yes 4/17/85	During the 1985 exercise the State EOC notified Brattleboro and other local EOCs prior to the release of EBS messages.	C
88.	Internal communications equipment (intercom) at the Brattleboro IFO was not reliable and hampered accurate information transfer between the Civil Defense and Department of Public Health staffs. (2.1.2.1)	9/21/83		5,3, 4	11	F.1.d	Vermont/IFO (Brattleboro)	State will review internal communications and physical configuration of office.	Yes 4/17/85	The quality of the available communications equipment was considered adequate at the 1985 exercise. All systems functioned effectively.	C
89.	Confusion between participants and unnecessary time delays in plant recovery were caused when the Vermont Public Service Nuclear Engineer became involved in matters which are the domain of the Vermont Department of Public Health. (2.4.1.1)	9/21/83		3,35	3,10, 14	A.2.a	Vermont (EOF)	No response.	Yes 4/17/85	The Vermont Public Service Nuclear Engineer and the representative of the Vermont Department of Public Health worked smoothly together at the 1985 exercise.	C
90.	No backup power was available at the media center; during a power outage, communications with the utility became inoperable, and lighting and media equipment could not be used. (2.4.2)	9/21/83		4,14	VT - 4,14 15,16 MA - 5,8 12	G.3.a	Vermont Massachusetts	No response.	Yes 4/17/85	A backup generator and multiple electrical extension cords were available at the Media Center during the 1985 exercise.	C

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91.	All members of one of the field monitoring teams did not have permanent-record dosimeters. (2.1.3.1)	9/21/83		20	112	K.3.a	Vermont	None: state needs to procure TLD's or film badges.	Yes 4/17/85	Only one member of each team at the 1985 exercise had TLDs.	I
92.	The radio telephone, which is the primary means of communication between the State EOC and Brattleboro, did not work. (2.1.5.1.1)	9/21/83	4.2.1.2 4.2.1.4 (2/18/82)	5	6	F.1.b	Brattleboro	Department of Public Safety has implemented corrective actions.	Yes 4/17/85	The radio telephone operation was improved during the 1985 exercise. During one temporary malfunction, corrective action was taken.	C
93.	Brattleboro did not receive prompt notification from the state to evacuate. (2.1.5.1.1)	9/21/83		15	8	J.9	Brattleboro	Addressed via additional state staff and upgrading radio-telephone system.	Yes 4/17/85	During the 1985 exercise, the Brattleboro EOC requested the State EOC to provide 45 minute lead time prior to evacuation. This was done.	C
94.	Permanent-record dosimeters were not available at the EOC. (2.1.5.1.3)	9/21/83		20	12	K.3.a	Brattleboro	None: state needs to procure TLDs or film badges.	Yes 4/17/85	No film badges or other permanent record dosimeters were available at the EOC during the 1985 exercise.	I
95.	The communication network available to the EOC was not effective. Reception was poor, confusing information was received, and situation updates were too infrequent. (2.1.5.2.1)	9/21/83	4.2.2.4 (2/18/82)	5	6	F.1.d	Dummerston	Department of Public Safety upgrading radio system.	Yes 4/17/85	Problems with the radio telephone receiver were evident during the 1985 exercise. The backup commercial telephone was inconvenient since it is located downstairs of the EOC.	I

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96.	A radiological exposure control program is not in place and dosimeters are not available. (2.1.5.2.2)	9/21/83	4.2.2.3 (2/18/81)	20	12	K.3.a O.1	Dummerston	Will be implemented by next exercise.	Yes 4/17/85	Although Dummerston has initiated a radiological exposure control program and dosimeters are now available, the exposure control activities were not demonstrated and the RADEF officer was not present for the 1985 exercise.	I
97.	The primary communications system did not function properly and only one commercial telephone was available for backup communications. (2.1.5.3.1)	9/21/83	4.2.2.7 (2/18/82)	5	6	F.1.d	Guilford	Department of Public Safety upgrading radio system.	Yes 4/17/85	The primary radio system again did not function well. Backup system was used.	I
98.	The responsibility for public alerting via EBS messages is not clearly defined in the town plan. (2.1.5.3.2)	9/21/83		13,15	8	E.5	Guilford	State planners will rectify town plan by next exercise.	Yes 4/17/85	The Guilford plan was unavailable for inspection in the EOC during the 1985 exercise.	
99.	The EOC staff was not properly trained in the use of dosimetry equipment and lacked knowledge of maximum doses. Also, permanent-record dosimeters were not available. (2.1.5.3.3)	9/21/83	4.2.2.8 (2/18/82)	20	12	K.3.a K.3.b	Guilford	Training will be provided by next exercise. State still needs to procure permanent record dosimeters.	Yes 4/17/85	Observations made during the 1985 exercise indicate EOC staff still lack sufficient training.	I
100.	Permanent-record dosimeters were not available at the EOC. (2.1.5.4.1)	9/21/83		20	12	K.3.a	Vernon	State needs to procure permanent record dosimeters.	Yes 4/17/85	Permanent record dosimeters were still not available at the EOC for the 1985 exercise.	I

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101.	The space and layout of the state EOC was not well suited for efficient operations. Also, backup power was not available to sustain communications.	9/21/83		4	2	H.3	New Hampshire	In August of 1984 state EOC moved to new quarters, which includes back-up power.	Yes 4/17/85	The new state EOC was used for the 1985 exercise. The new EOC was more spacious and the layout was adequate for emergency operations. Backup power was available but not demonstrated. Additional renovation of the EOC operational areas is scheduled for June 1985.	C
102.	Communications over the Civil Defense radio network did not function between the State EOC, the IFO, and the local EOCs. The backup centrex telephone system was overloaded at key times and did not provide back-up capability. (2.2.1.2)	9/21/83		5	2	F.1.d	New Hampshire	CD radio network was completed with modifications since the exercise. A new telephone system was purchased and installed.	Yes 4/17/85	The CD radio worked adequately for the 1985 exercise. The telephone system has 6 two-way lines serving approximately 25 phones. Although the telephone system can still be prone to overloading, additional lines are capable of being opened.	C
103.	Internal message flow between the operations room and the communications center was ineffective because messages were not relayed on standardized, hard-copy forms. Also, the operations officer could not simultaneously answer phones and coordinate internal message flow. (2.2.1.3)	9/21/83		3	3	A.2.a F.1.d	New Hampshire	Same form now being used in EOC and IFO as in the EOF. New EOC layout should address message flow.	Yes 4/17/85	Multiple-copy message forms were used during the 1985 exercise. The operations officer had a backup present for the exercise, and an operations controller, who assisted with message distribution, was also present.	C

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104.	Information from the EOF received at the EOC DPH assessment room was not written down on forms that were used at both locations. A standard form was available at the EOF, but not at the EOC, so accurate and timely reports were not available. Technical updates from the EOF were not periodically (at least every 30 minutes) received at the State EOC. (2.2.1.4)	9/21/83		5	5	F F.1	New Hampshire	See above comment.	Yes 4/17/85	The state EOC used the standard form (EOF form) during the 1985 exercise to record data used for dose assessment. Periodic updates from the EOF were also received at the EOC.	C
105.	The state DPH representative did not arrive at the EOF promptly, thus resulting in insufficient information flow to the State EOC for making protective action decisions based on accident assessment. (2.2.1.5)	9/21/83	EOC	10	5	H.4 F.1.d O.4.b	New Hampshire	Additional EOF liaison staff have been identified and trained for this function in the Dept. of Health. Also, NH C.D.A. has hired a staff member for use as an EOF team member.	Yes 4/17/85	In accordance with prior agreements, the DPH representative at the EOF was prepositioned for the 1985 exercise to assure the timely flow of technical information to the state EOC. In an actual emergency it is expected that sufficient time will be available for the DPH representative to arrive at the EOF.	C

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106.	A request for assistance in analysing the processing ingestion pathway samples did not accurately specify the type of assistance required. It was also not clear as to how the available resources would be integrated in the total response effort. (2.2.1.6)	9/21/83	3.2.1.6 (2/16/82)	32	3	A.2.a A.3	New Hampshire	State will incorporate comment into its procedures.		Not an objective of the 1985 exercise.	1
107.	The new Civil Defense communication system did not function adequately between the IFO and field monitoring teams. Also there was no backup radio system; commercial telephones were used if they were available. (2.2.2.1)	9/21/83		5	2	F.1.d	New Hampshire	See comment for state EOC. Also, additional personnel have been assigned to IFO: 1 communications, 1 clerical.	Yes 4/17/85	Dead spots in the radio net rendered the CD radio system incapable of continuous communications with field teams for the 1985 exercise.	1
108.	The IFO lacked overall management because the state Civil Defense representative in charge was too busy working as a telephone communicator. (2.2.2.2)	9/21/83		3	3	A.2.a	New Hampshire	See above comment and that for state EOC.	Yes 4/17/85	Although the Civil Defense representative was not involved with the communication operations for the 1985 exercise, management of the IFO operations was still a problem since the flow of information was inadequate.	1

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109.	Message logging at the IFO was informal (essential elements of communication were not recorded); important messages (plant status, meteorological conditions, field monitoring data, etc.) were not disseminated among key players, and no periodic briefings were held to update the staff on the status of the emergency. (2.2.2.3)	9/21/83	4.3.1.2 (2/18/82) 4.3.1.5 (2/18/82)	3	3	A.2.a	New Hampshire	See previous comments regarding standard use of EOF forms at EOC and IFO, and additional staffing and communication capability at IFO.	Yes 4/17/85	Message logging and distribution were still problems at the 1985 exercise. Messages were written down but not recorded in a sequential master log. Periodic briefings were informationally incomplete. Information and data were not being relayed to appropriate agencies.	I
110.	Communications used by the monitoring teams were ineffective. (2.2.3.1)	9/21/83		5	2	F.1.d	New Hampshire	Three additional radios have been procured for use by monitoring teams.	Yes 4/17/85	Communications were still observed to be ineffective for the 1985 exercise.	I
111.	Monitoring teams are not equipped with a low level G-M counter. Equipment provided to teams has short battery life and is not adequate for extended field use. (2.2.3.2)	9/21/83		7	5	I.8	New Hampshire	Monitoring teams have 3 mobile chargers. IFO has back-up calibrated CDV 700 instruments.	Yes 4/17/85	Equipment for the monitoring teams for the 1985 exercise was judged to be adequate.	C
112.	Dosimeters were not distributed or read, and IFO personnel were not familiar with radiological exposure control measures. (2.2.3.3)	9/21/83		20	3	K.3.a K.3.b	New Hampshire	IFO and monitoring team personnel will receive training in dosimetry.	Yes 4/17/85	Field monitoring team members had received training prior to the 1985 exercise and had appropriate dosimetry.	C
113.	The new Civil Defense radio did not work effectively. (2.2.5.1.1)	9/21/83		5	2	F.1.d	Chesterfield	Same as state, i.e., CD radio network improved.	Yes 4/17/85	Several independent radio systems were available and operating for the 1985 exercise, providing continuous radio contact and redundancy.	C

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

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114.	Communications between the Hinsdale EOC and all other emergency response organizations and emergency workers in the field were inadequate. The new Civil Defense radio was ineffective (messages were broken and could not be copied); the backup telephone went dead and could not be used most of the day; the Southwest Mutual Fire Aid radio has only one frequency and could not handle the large message load; and the portable amateur radio, dispatched by the state, was ineffective because reception was poor inside the EOC. (2.2.5.2.1)	9/21/83	4.3.2.2 (2/18/82)	5	2	F.1.b F.1.d	Hinsdale	• Same as above. • Additional pagers have been ordered. • Hinsdale Fire Dept. radio system has a new hi-band to low band voice repeater • An extension telephone line from the town's public works dept. installed in town EOC.	Yes 4/17/85	During the 1985 exercise the telephones, the Southwest Mutual Fire radio system, and the amateur radio operators and equipment were adequate. However, the Civil Defense radio continued to work only intermittently, despite some improvements made by the state.	I
115.	The ability to alert and notify emergency response personnel is severely restricted because radio-pagers do not work well in this area. Most personnel had to be notified by telephone, which became a problem when some staff members could not be located. (2.2.5.2.2)	9/21/83		1	1	E.2 F.1.e H.4	Hinsdale	See above.	Yes 4/17/85	The additional pagers were available for the 1985 exercise. These pagers have been used regularly for fires and other emergencies and work well.	C

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116.	Both communication systems, the new Civil Defense radio and the Southwest Mutual Fire Aid telephone, were unreliable. Messages received over the radio were broken and in some cases impossible to understand. Information received over the Fire Aid telephone differed from that from other sources. The EOC has insufficient equipment to communicate with emergency field teams. (2.2.5.3.1)	9/21/83		5	2	F.1.b F.1.d	Richmond	State has improved CD radio.	Yes 4/17/85	During the 1985 exercise the Richmond EOC demonstrated its ability to maintain emergency communications with all appropriate response organizations. The Civil Defense radio and the Southwest Mutual Fire Aid telephone were adequate for communication of messages, even though static sometimes made it difficult to hear the transmissions.	C
117.	EOC staff is notified by commercial telephone and radio pagers. Only one telephone and four radio pagers are available for this purpose. (2.2.5.3.2)	9/21/83		1	1	E.1 E.2 F.1.e	Richmond	An extension line from Selectman's office installed in town EOC.	Yes 4/17/85	An additional telephone line was installed in the EOC. Notification of EOC staff for the 1985 exercise was accomplished in a timely manner.	C
118.	The new Civil Defense radio worked poorly. Also, the EOC had only one telephone line. (2.2.5.4.1)	9/21/83		5	2	F.1.d	Swanzey	CD radio system upgraded by state.	Yes 4/17/85	The Civil Defense radio was observed to function adequately during the 1985 exercise.	C
119.	Failure of the Civil Defense radio resulted in delays in message receipt. No one at the EOC knew how to operate the system. (2.2.5.5.1)	9/21/83		5	2	F.1.b	Winchester	Same as above comment.	Yes 4/17/85	The Civil Defense radio still experienced problems during the 1985 exercise. The EOC had particular problems in trying to communicate with Keene.	I

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120.	The newly installed MCDA microwave radio system had severe equipment problems (static) that rendered it inoperable early in the exercise. This problem was compounded by the Area IV staff's failure to determine the Tri-State Mutual Fire Aid equipment also failed. Telephone calls were made to verify receipt of all emergency classification messages after the Alert status message, but busy signals were often encountered and primary notification became delayed. These problems were identified at Bernardston, Gill, Greenfield, Leyden, Northfield, and Warwick. (2.3.2.1)	9/21/83	3.3.1.4 (2/18/82)	5	6	F.1.b E.6	Massachusetts	New radio system has been revamped and will be the primary means of communication for the next test. Once the state EOC and the EOF are operational by MCDA and MDPH personnel, all notification of changes in emergency status will go to all communities simultaneously via the radio system with telephones used as back up. SOP assigns two (2) communities to one individual who confirms with the local governments the receipt of all radio messages. Completion date, 7/2/84.	Yes 4/17/85	The proposed actions by the State have been implemented and the system is fully operational and is functioning without problems.	C
121.	Permanent-record devices were not available. (2.3.3.2.1)	9/21/83		20	21	K.3.a	Gill	State action contingent upon funding from FEMA, i.e., no action.	Yes 4/17/85	Permanent record dosimeters were still not available for the 1985 exercise.	I
122.	Direct-read dosimeters were not distributed or read, and EOC personnel were not familiar with radiological exposure control measures. Permanent-record dosimeters were not available. (2.3.3.4.1)	9/21/83		20	21	K.3.a K.3.b	Leyden	• Same as above. • RAMONT training has been offered to town and includes instructions on exposure control measures. Town has accepted offer of training. Completion date, October, 1984.	Yes 4/17/85	Direct-read dosimeters were available but not distributed for the 1985 exercise. The EOC personnel were not familiar with the equipment or exposure control measures. The personnel did not know about the state training. No permanent record dosimeters were available.	I

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123.	Interference made messages over the Civil Defense radio inaudible. (2.3.3.6.1)	9/21/83		5	6	F.1.d	Warwick	Same as comment for state, i.e., CD radio system has been improved.	Yes 4/17/85	The radio system worked well for the 1985 exercise, providing clear communications.	C
124.	Permanent-record dosimeters were not available at the EOC. (2.3.3.6.2)	9/21/83				K.3.a	Warwick	Availability of film badges contingent on funding by FEMA; i.e., no action.	Yes 4/17/85	Permanent-record dosimeters were still not available at the EOC for the 1985 exercise.	I
125.	Decision making at the EOC was sometimes delayed due to the relative inexperience of some EOC staff members in radiological emergency preparedness exercises. Because of this the complex interaction of staff members required for decision making was not always efficient. (2.1.1.1)	4/17/85		3	1	G.1 G.5	Vermont				I
126.	Some difficulty was observed in formulating protective action messages which resulted in delays in getting these messages to the local EOCs. (2.1.1.2)	4/17/85		14	1,6	E.7	Vermont				I

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127.	Even though the field monitoring teams adequately performed their duties prescribed in the Vermont State plan, the low dose limits preclude the identification of the plume boundary and field verification of dose projections. Furthermore the RAC believes that the low allowable dose limits renders the Vermont field monitoring teams incapable of providing accurate field verification. Thus, Vermont would be dependent on utility field monitoring data and would not be able to verify the dose projections independently. (2.1.1.3)	4/17/85	2.1.1.2 (9/21/83)	7,8,10	4,3	I.9 I.11	Vermont				I
128.	The State Laboratory is not adequately equipped to handle the number of samples and radioactive waste resulting from a significant incident at the Vermont Yankee Nuclear Power Station. (2.1.2.1)	4/17/85		4,9	1	H.12 I.8	Vermont				I
129.	The laboratory personnel were not adequately prepared to handle the kinds and number of samples resulting from a significant incident at the Vermont Yankee Nuclear Power Station. (2.1.2.2)	4/17/85		9	1	O.4.c	Vermont				I

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130.	No effective centralized management and integrated control of the operations and activities at the Vermont IPO (Brattleboro) were evident during the exercise. (2.1.3.1)	4/17/85		3	1	A.1.b A.1.d	Vermont IPO (Brattleboro)				I
131.	The Vermont IPO in Brattleboro is inadequate to handle actual emergency operations since the facility is within the 10-mile EPZ and is presently unhardened. This would require evacuation in the event that protective actions became necessary. (2.1.3.2)	4/17/85	3.1.1.6 (2/18/82)	4,33	1	H.3	Vermont IPO (Brattleboro)				I
132.	One of the Vermont Agency of Transportation employees was unaware of procedures for radiological exposure control and had not been issued any radiological measuring instruments. (2.1.3.3)	4/17/85		20	8	K.3.a K.3.b	Vermont/IPO (Brattleboro)				I
133.	Although Vermont IPO staff arranged for evacuation buses and a staging area for the buses, staff members were unclear on bus route assignments and an agency contact for ordering the commencement of bus evacuation. (2.1.3.4)	4/17/85		3,15	1,7	A.1.b J.10.g O.1	Vermont/IPO (Brattleboro)				I

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134.	Radiological exposure control for Vermont IPO workers and emergency workers dispatched from the IPO was inadequate, including knowledge of proper procedures, and issuance and use of dosimeters. (2.1.3.5)	4/17/85		20	8	K.3.a K.3.b O.1	Vermont/IPO (Brattleboro)				I
135.	The field teams lacked familiarity with the instrumentation. (2.1.4.1)	4/17/85		7,8,9	3	I.8	Vermont				I
136.	The monitoring surveys were incomplete; only closed window readings were done. (2.1.4.2)	4/17/85		7,8	3	I.8	Vermont				I
137.	The teams did not have the capability for measuring radioiodine in the field. (2.1.4.3)	4/17/85	4.2.1.12 (2/18/82)	8	3	H.7 I.9	Vermont				I
138.	Not all team members had permanent record dosimeters. (2.1.4.4)	4/17/85	2.1.3.1 (9/21/83)	20	8	K.3.a	Vermont				I
139.	Vermont does not have a numbering system for its field monitoring points. (2.1.4.5)	4/17/85		7,8,9	3	J.10.a	Vermont				I
140.	Radio communications were from the field teams to the State EOC instead of the IPO a procedure which is not in accordance with the plan. (2.1.4.6)	4/17/85		5	2	F.1.d	Vermont				I

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141.	Emergency personnel at the Brattleboro EOC generally were unable to properly assess accident assessment information. (2.1.6.1.1)	4/17/85	4.2.2.2 (2/18/82)	3	1	I.8 O.1	Brattleboro				I
142.	The simulated EBS messages on sheltering and evacuation did not provide sufficiently detailed information on who specifically should shelter and evacuate. (2.1.6.1.2)	4/17/85		14	6,9	E.5 E.7	Brattleboro				I
143.	Radiological exposure control was weak at the Brattleboro EOC. The direct-read dosimeters were not read and recorded on a regular basis, and permanent record devices were not available. (2.1.6.1.3)	4/17/85	4.2.2.3 (2/18/82)	20,21 22	8	E.3.a E.3.b O.1	Brattleboro				I
144.	Periodic problems were again encountered with the radio-telephone communication system at the Dummerston EOC. (2.1.6.2.1)	4/17/85	2.1.5.2.1 (9/21/83)	5	1	F.1.b F.1.d	Dummerston				I
145.	The Dummerston EOC did not fully demonstrate its capabilities to implement a radiological exposure control program. (2.1.6.2.2)	4/17/85	2.1.5.2.2 (9/21/83)	20,21 22	8	E.3 E.4	Dummerston				I

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146.	A copy of the Guilford emergency plan was not available for reference at the EOC. (2.1.6.3.1)	4/17/85		4	1	P.5	Guilford				I
147.	At the Guilford EOC, the radio-telephone, which is the primary communication system, worked poorly during much of the exercise. (2.1.6.3.2)	4/17/85	2.1.5.3.1 (9/21/83)	5	1	F.1.b F.1.d	Guilford				I
148.	The Guilford EOC did not fully demonstrate its capabilities to implement a radiological exposure control program. Dosimeters were not observed at the EOC, permanent record dosimeters were known by the staff not to be available, and EOC staff was not suitably trained in the use of dosimeters. (2.1.6.3.3)	4/17/85	4.2.2.8 (2/18/82) 2.1.5.3.3 (9/21/83)	20,21 22	8	E.3 E.4 O.1	Guilford				I
149.	The Vernon EOC Director became too personally involved with the routine tasks of monitoring incoming radio transmissions and preparing message logs (2.1.6.4.1).	4/17/85		2,3	1	A.1.d	Vernon				I
150.	The Vernon EOC staff were observed to be unsure of the division of responsibility in decision making between the state and the local EOC (2.1.6.4.2).	4/17/85		3	1	A.1.b	Vernon				I

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151.	The sounding of the sirens in Vernon was not coordinated with the EBS message (2.1.6.4.3)	4/17/85		13,14	5,6	E.5	Vernon				I
152.	The Vernon EOC staff indicated that Vernon resources were not sufficient to staff all traffic control points; however, no staff members were observed to contact the state to request assistance (2.1.6.4.4).	4/17/85		15,17 3	7	A.1.b J.10.j	Vernon				I
153.	During the evacuation the Vernon EOC recommended to the school that relocation be to Greenfield, Massachusetts, rather than to Bellows Falls, Vermont, as recommended by the State (2.1.6.4.5).	4/17/85		3,19	1,7 10	J.10.e J.10.h	Vernon				I
154.	Permanent record dosimeters were not available at the Vernon EOC. (2.1.6.4.6).	4/17/85	2.1.5.4.1 (9/21/83)	20	8	K.3.a	Vernon				I
155.	The Vernon EOC staff were not knowledgeable about proper procedures for the use of KI. (2.1.6.4.7)	4/17/85		21,22	8	J.10.e J.10.f	Vernon				I

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156.	There were significant lapses in internal communications between upper level operations management and EOC operations staff. The most significant example of this is that the operations room staff was never informed that a release was in progress, or that it had subsequently been terminated. This was also reflected in the status boards in the operations room, where the release data were never recorded. (2.2.1.1)	4/17/85		3,4	3	A.2.a F.1.d	New Hampshire				I
157.	Exchange of information among the Department of Public Health accident assessment staff and between representatives of DPH management and Civil Defense operations management, did not result in rapid enough communication of accident assessment data from the plant and the field for the Governor to make appropriate protective action decisions. (2.2.1.2). (CATEGORY A DEFICIENCY).	4/17/85		3,10	3,5	A,F	New Hampshire				I
158.	Accident assessment was done with hand calculations and, therefore, was slow. (2.2.1.3)	4/17/85		10	5	I.8	New Hampshire				I

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159.	The State has not yet procurred a supply of KI to be stockpiled in Concord for use by emergency workers. (2.3.1.4)	4/17/85	4.3.1.6 (2/18/82)	22	6	J.10.e	New Hampshire				I
160.	Laboratory staff need additional training in order to develop an SOP for a complete environmental surveillance program, which includes the ability to obtain quantitative results from sample analysis and proper techniques for dealing with equipment operation characteristics. (2.2.2.1)	4/17/85		9	5	I.8	New Hampshire (State Laboratory)				I
161.	The laboratory does not have an adequate shield for its Ge(Li) detector (i.e., one with a cover) to reduce the background count rate and enable lab staff to make quantitative calculations. (2.2.2.2)	4/17/85		9	5	I.8	New Hampshire (State Laboratory)				I
162.	The Civil Defense communication system did not function adequately between the IPO and field monitoring teams. Also, there was no backup radio system; commercial telephones were used if they were available. (2.2.3.1)	4/17/85	2.2.2.1 (9/21/83)	5	2	F.1.d	New Hampshire IPO (Keene)				I

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163.	The communications problems were instrumental in keeping meteorological information from reaching the teams in a timely manner, and they were not dispatched to proper monitoring locations as a result. (2.2.3.2).	4/17/85		5	2	I.8, I.11	New Hampshire IPO (Keene)				I
164.	There were insufficient telephone lines (1) and no back-up communications system to the Relocation Center. (2.2.3.3)	4/17/85		5	2	F.1.d	New Hampshire IPO (Keene)				I
165.	EBS messages broadcast were not monitored. (2.2.3.4)	4/17/85		3,14	3,9	E.5	New Hampshire IPO (Keene)				I
166.	SOPs were not followed by field teams during off-site radiological monitoring. (2.2.4.1)	4/17/85		7,8,9	5	I.7, I.11	New Hampshire				I
167.	The teams did not fully understand how, why, and when to administer KI. (2.2.4.2)	4/17/85		21,22	6	J.10.e	New Hampshire				I
168.	Information provided to off-site teams from the IPO was cursory. (2.2.4.3)	4/17/85		5	2	F.1.d	New Hampshire				I
169.	There was not enough dosimetry equipment. (2.2.6.1.1)	4/17/85		20	6	K.3.a	Chesterfield				I

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170.	The Civil Defense radio used as the primary means of communicating with the IFO in Keene did not work properly. (7.2.6.2.1)	4/17/85	2.2.5.2.1 (9/21/83)	5	2	F.1.b	Hinsdale				I
171.	Full staffing was never achieved, notably, radio was not monitored and several important transmissions were missed. (2.2.6.4.1)	4/17/85	4.3.2.2 (2/18/82)	2,3,5	1	I.8	Swanzey				I
172.	The Civil Defense Radio did not work well in all instances. The EOC and field teams could not reach the IFO. (2.2.6.5.1).	4/17/85	2.2.5.5.1 (9/21/83)	5	2	F.1.b	Winchester				I
173.	Although the General Emergency message notification was received by the State it did not come through NAWAS and the State Police in accordance with the communication channel shown in the plan. There was no explanation available for this incident. It could have been an EOF, EOC, State Police or utility lapse. (2.3.1.1)	4/17/85		3,5	A.3 A.4	E.1	Massachusetts				I

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174.	There were some problems (see Leyden and Warwick) early in the exercise with communications at some of the local EOCs. These were traced to inexperienced operators. Although back-up systems worked, the primary means did not in every location 100% of the time. (2.3.2.1)	4/17/85		5,1	A.1 A.4	F.1.b	Massachusetts Area IV EOC				I
175.	Updated public information brochures are said to have been distributed. However, none could be produced. This has been noted as a deficiency in previous exercises. (2.3.3.1.1)	4/17/85	4.4.2.2 (2/18/82)	14	A.6	G.2	Bernardston				I
176.	Although evacuation maps showing population by areas, access control points, and sector designation are in the plan, they were not shown on posted displays. This is a previous uncorrected deficiency. (2.3.3.1.2)	4/17/85	4.4.2.1 (2/18/82)	4	B.2	J.10.a J.10.h J.10.j	Bernardston				I
177.	Permanent record exposure devices were not available. (2.3.3.1.3).	4/17/85		20	B.5	K.3.a	Bernardston				I
178.	No one present was aware of the maximum allowable dose or of procedures for authorizing emergency workers to incur exposures exceeding the EPA PAGs. 2.3.3.1.4)	4/17/85		20	B.5	K.4	Bernardston				I

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179.	No permanent exposure record devices or record keeping forms were available. Little knowledge of exposure record keeping procedures, allowable exposure level, or procedures for getting permission to exceed PAGs was evident. (2.3.3.2.1)	4/17/85	2.3.3.2.1 (9/21/83)	20	B.5	K.3.a K.4	Gill				I
180.	Displays did not contain all required information such as population access and traffic control points. No status board was available. (2.3.3.2.2)	4/17/85		4	B.2	J.10.a J.10.b	Gill				I
181.	No one is named as a relief for the dispatcher. (2.3.3.2.3)	4/17/85		2	A.2	A.2.a	Gill				I
182.	Displays such as a status board and maps, while available, were not used. This deficiency was also noted in previous exercises. (2.3.3.4.1)	4/17/85		4	B.2	J.10.a J.10.b	Leyden				I
183.	Because of the inadequate training of the EOC staff, the controller performed emergency response functions. (2.3.3.4.2)	4/17/85		3	A.3	H.1	Leyden				I
184.	The status board was not kept up-dated and displays lacked complete information. (2.3.3.5.1)	4/17/85		4	B.2	J.10.a J.10.b	Northfield				I

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
185.	Effectiveness of the new Civil Defense radio microwave system was diminished because of its location away from the EOC. (2.3.3.5.2)	4/17/85		4,5	A.4 B.2	F.1.b	Northfield				I
186.	Displays did not include all necessary information for ready reference. (2.3.3.6.1)	4/17/85		4	B.2	J.10.a J.10.b J.10.j	Warwick				I
187.	Communication procedures between the states and utility as given in their respective plans were not followed for the General Emergency Classification, which caused serious delays in official notification of state and local governments. (2.4.1.1). (CATEGORY A DEFICIENCY).	4/17/85		3,5	VT-1 NH-2 MA-A.3 A.4	E.1	(EOF) Vermont New Hampshire Massachusetts				I
188.	The utility did not provide states with meteorological data and plume movement projections in a timely manner. (2.4.1.2)	4/17/85		3,5 10	VT-1,4 NH-2,5 MA-A.3 A.4,B.4	I.8	(EOF) Vermont New Hampshire Massachusetts				I
189.	The Utility disseminated misleading and inaccurate public information, including protective action recommendations that could have conflicted with those recommended by State authorities. In a real incident, this would have confused the public. (2.4.2.1)	4/17/85		3,14 25	VT-1,6 9,12 NH-4,9 MA-A.3 A.6,A.8	G.4	(Media Center) Vermont New Hampshire Massachusetts				I

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 FEMA-REP-1 Rev. 1 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
190.	There was a lack of genuine coordination and cooperation between the utility and State PIOs. Utility news releases were issued without giving State PIOs the opportunity to review them for possible changes and comments. The Utility PIO failed to keep State PIOs sufficiently briefed on a timely basis regarding plant status and the changing situation. (2.4.2.2)	4/17/85		25,3	VT-1,9 12 NH-4 MA-A.3 A.6	A.1.b E.6,E.7 G.4	(Media Center) Vermont New Hampshire Massachusetts				I
191.	The Media Center is still located in the EPZ, as is the designated back-up Media Center. (2.4.2.3)	4/17/85	3.2.1.1 (2/18/82)	4	VT-1 NH-7 MA-B.2	G.3.a	(Media Center) Vermont New Hampshire Massachusetts				I

TABLE 3: DEFICIENCY TRACKING TABLE
VERMONT YANKEE NUCLEAR POWER STATION

NOTES:

Issue Identification Code Numbers: Deficiency identification number which appears in parentheses after the issue description and, where appropriate, in the column for previously identified issues. The first three or four digits refer to the report section number in which the deficiency is presented. The last digit refers to the specific number of the deficiency as listed in the report section.

FEMA Objective: From the list of FEMA's standard 35 core objectives.

Exercise Objective: From the listings of state's exercise objectives as presented in each of the post exercise assessment reports.

Action Taken: The action taken by the state and local jurisdictions in response to the proposed actions.

Objective Subsequently Tested: Indicates whether or not the associated objectives have been tested at a subsequent exercise. Also provides the exercise date.

Corrective Action Verified: Described the results of the corrective actions as observed during the exercise.

Current Status: C = Complete
I = Incomplete

TABLE 4 Status of Objectives, Vermont Yankee Nuclear Power Station

FEMA CORE Objective	Year of Exercise	Vermont: Objective Overall Met for Site	Vermont: State	Vermont: IPO	Vermont: Brattleboro	Vermont: Dummerston	Vermont: Guilford	Vermont: Vernon	Vermont: Field Monitoring	New Hampshire: Objective Overall Met for Site	New Hampshire: State	New Hampshire: IPO	New Hampshire: Chesterfield	New Hampshire: Hinsdale	New Hampshire: Richmond	New Hampshire: Swanzey	New Hampshire: Winchester	New Hampshire: Field Monitoring	Massachusetts: Objective Overall Met for Site	Massachusetts: State	Massachusetts: Area EOC	Massachusetts: Bernardston	Massachusetts: Gill	Massachusetts: Greenfield	Massachusetts: Leyden	Massachusetts: Northfield	Massachusetts: Warwick	Tri State: Objective Overall Met for Site	Tri State: EOF	Tri State: Media Center
1. Demonstrate ability to mobilize staff and activate facilities promptly.	1982		I*	A	A	I*	I*	A	A		A	A	A	A	I*	I*	A	I*		A	A	A	I*	A	A	A	A		A	A
	1983		A	A	A	A	A	A	A		A	I*	A	I*	I*	A	A	A		A	A	A	A	A	A	A			A	A
	1985		A	A	A	A	A	A	A		A	A	A	A	A	A	A	A		A	A	A	A	A	A	A	A		A	A
2. Demonstrate ability to fully staff facilities and maintain staffing around the clock.	1982		I*	A	A	I*	A	A	A		I*	A	A	A	I*	A	A	I*		I*	A	A	A	A	A	A	A		I*	A
	1983		A	A	A	A	A	A	A		M	I*	A	A	A	A	A	A		A	A	A	A	A	A	A	A		A	A
	1985		A	A	A	A	A	A	A		A	A	A	A	A	I*	A	A		A	A	A	I*	A	I*	A	A		A	A
3. Demonstrate ability to make decisions and coordinate emergency activity.	1982		I*	A	A	A	A	A	A		I*	A	I*	A	A	I*	I*	-		I*	A	A	A	A	A	A	A		A	I*
	1983		I*	A	I*	A	A	A	A		I*	I*	A	A	A	A	A	A		A	A	A	A	A	A	A	A		A	A
	1985		A	I*	I*	A	A	I*	-		I	A	A	A	A	A	A	A		A	A	A	A	A	A	A	A		A	I*
4. Demonstrate adequacy of facilities and displays to support emergency operation.	1982		I*	I*	A	I*	I*	A	-		I*	A	I*	I*	I*	I*	I*	-		I*	A	I*	A	I*	A	A	A		I*	I*
	1983		I*	I*	I*	A	A	A	-		I*	A	A	A	A	A	A	-		I*	A	A	A	A	A	A	A		A	I
	1985		A	I*	A	A	I*	A	-		A	A	I*	A	A	A	A	-		A	A	I*	I*	A	I*	I*	I*		A	A
5. Demonstrate ability to communicate with all appropriate locations, organizations, and field personnel.	1982		I*	I*	I*	I*	I*	I*	I*		I*		A	I*	I*	A	A	-		I*	A	A	A	I*	A	A	A	I*	A	A
	1983		A	A	I*	I*	I*	A	A		I*	I*	I*	I*	I*	I*	I*	I*		I*	I*	A	A	A	A	A	A	I*	A	A
	1985		A	I*	A	I*	I*	A	A		I	I*	A	I*	A	A	I*	I*		A	I*	A	A	A	A	I*	A		I*	I*
6. Demonstrate ability to mobilize and deploy field monitoring teams in a timely fashion.	1982		A	A	M	M	M	M	A		A	M	M	M	M	M	M	M		A	M	M	M	M	M	M	M		M	M
	1983		M	A	M	M	M	M	A		A	A	M	M	M	M	M	A		M	M	M	M	M	M	M	M		-	-
	1985		A	I*	M	M	M	M	M		M	A	M	M	M	M	M	A		M	M	M	M	M	M	M	M		-	-
7. Demonstrate appropriate equipment and procedures for determining ambient radiation levels.	1982		I*	I*	I*	M	M	M	I*		I*	-	M	M	M	M	M	I*		A	M	I*	M	M	M	M	M		M	M
	1983		M	-	M	M	M	M	M		I*	-	M	M	M	M	M	I*		M	M	M	M	M	M	M	M		-	-
	1985		A	-	M	M	M	M	I*		M	I*	M	M	M	M	M	I*		M	M	M	M	M	M	M	M		-	-
8. Demonstrate appropriate equipment and procedures for measuring airborne radioiodine concentrations as low as 10^{-7} $\mu Ci/cm^3$ in the presence of noble gases.	1982		I*	I*	I*	M	M	M	I*		I*	-	M	M	M	M	M	I*		A	M	M	M	M	M	M	M		M	M
	1983		A	-	M	M	M	M	M		I	-	M	M	M	M	M	I*		M	M	M	M	M	M	M	M		-	-
	1985		A	-	M	M	M	M	I*		M	A	M	M	M	M	M	I*		M	M	M	M	M	M	M	M		-	-
9. Demonstrate appropriate equipment and procedures for collection, transport and analysis of samples of soil, vegetation, snow, water, and milk.	1982		I	-	I*	M	M	M	I*		I*	-	M	M	M	M	M	I*		A	M	M	M	M	M	M	M		M	M
	1983		A	-	M	M	M	M	M		A	-	M	M	M	M	M	I*		M	M	M	M	M	M	M	M		-	-
	1985		M	-	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		-	-
10. Demonstrate ability to project dosage to the public via plume exposure, based on plant and field data, and to determine appropriate protection measures, based on PAGs, available shelter, evacuation time estimates, and all other appropriate factors.	1982		I	-	M	M	M	M	-		I	-	M	M	M	M	M	-		N/O	M	M	M	M	M	M	M		M	M
	1983		A	-	M	M	M	M	-		I*	-	M	M	M	M	M	-		A	-	M	M	M	M	M	M		-	-
	1985		A	-	M	M	M	M	M		I	M	M	M	M	M	M	M		A	M	M	M	M	M	M	M		-	-
11. Demonstrate ability to project dosage to the public via ingestion pathway exposure, based on field data, and to determine appropriate protective measures, based on PAGs and other relevant factors.	1982		I	I*	M	M	M	M	I*		I	-	M	M	M	M	M	-		N/O	M	I	M	M	M	M	M		M	M
	1983		A	-	M	M	M	M	-		A	-	M	M	M	M	M	-		A	-	M	M	M	M	M	M		-	-
	1985		M	-	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		-	-

TABLE 4 Status of Objectives, Vermont Yankee Nuclear Power Station

FEMA CORE Objective	Year of Exercise	Vermont: Objective Overall Met for Site	Vermont: State	Vermont: IFO	Vermont: Brattleboro	Vermont: Dummerston	Vermont: Guilford	Vermont: Vernon	Vermont: Field Monitoring	New Hampshire: Objective Overall Met for Site	New Hampshire: State	New Hampshire: IFO	New Hampshire: Chesterfield	New Hampshire: Hinsdale	New Hampshire: Richmond	New Hampshire: Swanzey	New Hampshire: Winchester	New Hampshire: Field Monitoring	Massachusetts: Objective Overall Met for Site	Massachusetts: State	Massachusetts: Ara/IV EOC	Massachusetts: Bernardston	Massachusetts: Gill	Massachusetts: Greenfield	Massachusetts: Leyden	Massachusetts: Northfield	Massachusetts: Warwick	Tri State: Objective Overall Met for Site	Tri State: EOF	Tri State: Media Center
12. Demonstrate ability to implement protective actions for ingestion pathway hazards.	1982		A	M	M	M	M	M	M		A	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1983		A	M	M	M	M	M	M		A	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1985		M	-	M	M	M	M	M		M	-	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
13. Demonstrate ability to alert the public within the 10-mile EPZ, and disseminate an initial instructional message within 15 minutes. (Separate FEMA test of A/M system will be conducted in June, 1985.)	1982		A	A	A	A	A	I*	-		A	A	A	A	A	A	A	-		A	-	A	I*	A	A	A	A		A	A
	1983		I*	-	A	A	I*	A	-		A	-	A	A	A	A	A	-		A	-	A	A	A	A	A	A		A	A
	1985		A	-	A	A	A	I*	-		A	-	A	A	A	A	A	-		A	A	A	A	A	A	A	A		-	-
14. Demonstrate ability to formulate and distribute appropriate instructions to the public, in a timely fashion.	1982		A	-	A	A	A	I*	-		A	-	A	A	A	A	A	-		A	-	A	A	A	A	A	A		A	A
	1983		I*	-	A	A	A	A	-		I*	-	A	A	A	A	A	-		I*	-	A	A	A	A	A	A		A	I
	1985		A	-	I*	A	A	I*	-		I*	-	A	A	A	A	A	-		A	A	A	A	A	A	A	A		A	I*
15. Demonstrate the organizational ability and resources necessary to manage an orderly evacuation of all or part of the plume EPZ.	1982		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		M	M	M	M	M	M	M	M		A	M
	1983		I*	A	I*	A	I*	A	-		A	-	A	A	A	A	A	-		A	A	A	A	A	A	A	A		A	M
	1985		A	-	A	A	A	A	-		M	-	M	M	M	M	M	-		M	M	M	M	M	M	M	M		-	-
16. Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, as inclement weather or traffic obstructions.	1982		M	M	M	M	M	M	-		M	M	M	M	M	M	M	-		M	A	M	M	M	M	M	M		M	M
	1983		A	M	M	M	M	M	-		A	M	M	M	M	M	M	-		A	A	M	M	M	M	M	M		M	M
	1985		M	-	M	M	M	I*	-		M/O	M/O	M/O	M/O	M/O	M/O	M/O	-		M/O	M/O	M/O	M/O	M/O	M/O	M/O	M/O		-	-
17. Demonstrate the organizational ability and resources necessary to control access to an evacuated area.	1982		A	A	A	A	A	A	-		A	M	I*	A	A	A	A	-		M	M	M	M	M	M	M	M		A	M
	1983		M	A	M	M	M	M	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1985		M	-	M	M	M	M	-		M	M	M	M	M	M	M	-		A	M	M	M	M	M	M	M		M	M
18. Demonstrate the organizational ability and resources necessary to effect an orderly evacuation of mobility-impaired individuals within the plume EPZ.	1982		A	A	I*	A	A	A	-		A	M	A	A	A	A	A	-		M	M	M	M	M	M	M	M		A	M
	1983		M	M	M	M	M	M	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1985		M	-	M	M	M	M	-		M	M	M	M	M	M	M	-		A	M	A	A	A	A	A	A		-	-
19. Demonstrate the organizational ability and resources necessary to effect an orderly evacuation of schools within the plume EPZ.	1982		A	-	A	A	A	A	-		A	M	A	A	A	A	A	-		M	M	M	I*	M	M	M	M		A	M
	1983		A	-	A	A	A	A	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1985		M	-	M	M	M	M	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		-	-
20. Demonstrate ability to continuously monitor and control emergency worker exposure.	1982		I	A	A	A	I*	A	A		I*	I*	I*	I*	A	A	A	I*		A	-	A	A	A	A	A	A		A	A
	1983		I*	I*	I*	I*	I*	I*	I*		I*	I*	A	A	A	A	A	I*		A	-	A	I*	A	I*	A	A		A	A
	1985		I	I*	I*	I*	I*	I*	I*		A	A	A	A	A	A	A	I*		A	-	I*	I*	A	A	A	A		A	-
21. Demonstrate the ability to make the decision, based on predetermined criteria, whether to issue KI to emergency workers and/or the general population.	1982		A	-	-	-	-	-	M		I*	I*	-	-	-	-	-	I*		M	-	-	-	-	-	-	-		A	-
	1983		M	-	-	-	-	-	M		M	A	-	-	-	-	-	A		M	-	-	-	-	-	-	-		M	-
	1985		M	M	M	M	M	M	M		M	I*	-	-	-	-	-	I*		M	M	M	M	M	M	M	M		-	-
22. Demonstrate the ability to supply and administer KI, once the decision has been made to do so.	1982		A	A	A	A	A	A	A		A	A	A	A	A	A	A	A		M	-	M	I*	M	M	M	M		A	A
	1983		M	M	M	M	M	M	M		M	A	M	M	M	M	M	A		M	-	M	M	M	M	M	M		M	M
	1985		M	M	M	M	M	M	M		A	I*	M	M	M	M	M	I*		M	M	M	M	M	M	M	M		-	-
23. Demonstrate ability to effect an orderly evacuation of on site personnel.	1982		M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M
	1983		M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M
	1985		M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M	M	M	M	M	M	M		M	M

TABLE 4 Status of Objectives, Vermont Yankee Nuclear Power Station

FEMA CORE Objective	Year of Exercise	Vermont: Objective Overall Met for Site	Vermont: State	Vermont: IPO	Vermont: Brattleboro	Vermont: Dummerston	Vermont: Guilford	Vermont: Vernon	Vermont: Field Monitoring	New Hampshire: Objective Overall Met for Site	New Hampshire: State	New Hampshire: IPO	New Hampshire: Chesterfield	New Hampshire: Hinsdale	New Hampshire: Richmond	New Hampshire: Swanzey	New Hampshire: Winchester	New Hampshire: Field Monitoring	Massachusetts: Objective Overall Met for Site	Massachusetts: State	Massachusetts: Athol EOC	Massachusetts: Bernardston	Massachusetts: Gill	Massachusetts: Greenfield	Massachusetts: Leyden	Massachusetts: Northfield	Massachusetts: Warwick	Tri State: Objective Overall Met for Site	Tri State: EOF	Tri State: Media Center
24. Demonstrate ability to brief the media in a clear, accurate and timely manner.	1982		A	-	M	M	M	M	-		A	-	M	M	M	M	M	-		A	M	M	M	M	M	M	M		M	A
	1983		A	-	M	M	M	M	-		A	-	M	M	M	M	M	-		A	M	M	M	M	M	M	M		-	A
	1985		-	-	-	-	-	-	-		-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-		-	I*
25. Demonstrate ability to provide advance coordination of information released.	1982		I*	-	M	M	M	M	-		I*	-	M	M	M	M	M	-		I*	M	M	M	M	M	M	M		M	I*
	1983		A	-	M	M	M	M	-		A	-	M	M	M	M	M	-		A	M	M	M	M	M	M	M		M	A
	1985		-	-	-	-	-	-	-		-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-		-	I*
26. Demonstrate ability to establish and operate rumor control in a coordinated fashion.	1982		A	-	M	M	M	M	-		A	-	M	M	M	M	M	-		A	M	M	M	M	M	M	M		M	A
	1983		A	-	M	M	M	M	-		A	-	M	M	M	M	M	-		A	M	M	M	M	M	M	M		M	A
	1985		M	M	M	M	M	M	-		M	M	M	M	M	M	M	-		A	M	M	M	M	M	M	M		-	M
27. Demonstrate adequacy of procedures for registration and radiological monitoring of evacuees.	1982		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		M	-	M	M	M	M	M	M		A	A
	1983		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		A	-	A	A	A	A	A	A		A	A
	1985		A	-	-	-	-	-	-		A	-	-	-	-	-	-	-		A	-	-	-	-	-	-	-		-	-
28. Demonstrate adequacy of facilities for mass care of evacuees.	1982		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		M	-	M	M	M	M	M	M		A	A
	1983		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		A	-	A	A	A	A	A	A		A	A
	1985		A	-	-	-	-	-	-		A	-	-	-	-	-	-	-		A	-	-	-	-	-	-	-		-	-
29. Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment and vehicles.	1982		I*	-	A	A	A	A	-		A	-	I*	A	A	A	A	-		M	M	M	M	M	M	M	M		A	A
	1983		A	-	A	A	A	A	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1985		M	M	M	M	M	M	-		M/O	-	-	-	-	-	-	-		M	M	M	M	M	M	M	M		-	-
30. Demonstrate adequacy of ambulance facilities and procedures for handling contaminated individuals.	1982		A	-	A	A	A	A	-		I*	-	A	A	A	A	A	-		M	-	M	M	M	M	M	M		A	A
	1983		M	-	M	M	M	M	-		M	-	M	M	M	M	M	-		M	M	M	M	M	M	M	M		-	-
	1985		M	M	M	M	M	M	-		A	-	-	-	-	-	-	-		M	M	M	M	M	M	M	M		-	-
31. Demonstrate adequacy of hospital facilities and procedures for handling contaminated individuals.	1982		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		M	-	M	M	M	M	M	M		M	M
	1983		M	-	M	M	M	M	-		M	-	M	M	M	M	M	-		M	M	M	M	M	M	M	M		-	-
	1985		M	M	M	M	M	M	-		A	-	-	-	-	-	-	-		M	M	M	M	M	M	M	M		-	-
32. Demonstrate ability to identify need for, request and obtain Federal assistance.	1982		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		A	-	A	A	A	A	A	A		A	A
	1983		A	-	A	A	A	A	-		I*	-	A	A	A	A	A	-		A	-	-	-	-	-	-	-		A	A
	1985		A	-	-	-	-	-	-		A	-	-	-	-	-	-	-		A	-	-	-	-	-	-	-		A	A
33. Demonstrate ability to relocate and operate the alternate EOF/EOC.	1982		M	-	M	M	M	M	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1983		A	A	M	M	M	M	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
	1985		M	M	M	M	M	M	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
34. Demonstrate ability to estimate total population exposure.	1982		A	-	A	A	A	A	-		I*	-	A	A	A	A	A	-		A	-	A	A	A	A	A	A		A	A
	1983		A	-	A	A	A	A	-		A	-	A	A	A	A	A	-		M	M	M	M	M	M	M	M		M	M
	1985		M	M	M	M	M	M	-		M	M	M	M	M	M	M	-		M	M	M	M	M	M	M	M		M	M
35. Demonstrate ability to determine and implement appropriate measures for controlled recovery and reentry.	1982		I*	A	A	A	A	A	-		M/O	M/O	M	M	M	M	M	-		M	M	M	M	M	M	M	M		A	A
	1983		I*	I*	A	A	A	A	-		A	M/O	A	A	A	A	A	-		A	A	A	A	A	A	A	A		A	A
	1985		M	M	M	M	M	M	-		A	-	-	-	-	-	-	-		M	M	M	M	M	M	M	M		M	M

Legend

* - Corrective Actions Identified

M - Not an Exercise Objective

A - Objective, fully demonstrated (Adequate)

N/O - Not Observed by FEMA

I - Objective, not fully demonstrated (Inadequate)

\- - Not Applicable