UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

September 7, 1990

MEMORANDUM FOR: Ronald R. Bellamy, Chief
Facilities Radiological Safety
and Safeguards Branch
Division of Radiation Safety
and Safeguards
Region I

FROM: Robert A. Erickson, Chief
Emergency Preparedness Branch
Division of Radiation Protection
and Emergency Preparedness
Office of Nuclear Reactor Regulation

SUBJECT: FEMA EXERCISE REPORT FOR THE YANKEE ROWE NUCLEAR POWER PLANT

Enclosed is a letter from Dennis Kwiatkowski of the Federal Emergency Management Agency (FEMA) dated August 23, 1990, transmitting the FEMA Region I report for the April 26-27, 1988 full participation exercise at the Yankee Rowe Nuclear Power Plant. The Commonwealth of Massachusetts and the States of Vermont, New Hampshire, and New York along with the towns in the plume emergency planning zone participated in the exercise.

Four deficiencies were identified during this exercise. These deficiencies involved the Massachusetts EOC decision-making process, Massachusetts EOC's adherence to public notification procedures, Belchertown EOC's communcications equipment, and the timeliness of Readsboro's EOC activation. All four deficiencies were corrected during a remedial exercise that was conducted on August 24, 1988.

We recommend that you transmit the enclosed FEMA letter and exercise report to the licensee with the request that the licensee in coordination with offsite authorities ensure that the areas requiring corrective action identified by FEMA have been addressed.

for Robert A. Erickson, Chief
Emergency Preparedness Branch
Division of Radiation Protection
and Emergency Preparedness
Office of Nuclear Reactor Regulation

Enclosure:
FEMA ltr. dtd. 8/23/90
w/enclosure

Federal Emergency Management Agency

Washington, D.C. 20472

Mr. Frank J. Congel
Director
Division of Radiation Protection
and Emergency Preparedness
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Congel:

Enclosed is a copy of the exercise report for the April 26 - 27, 1988, full-participation exercise of the offsite radiological emergency response plans, site-specific to the Yankee Rowe Nuclear Power Plant, located in Rowe, Massachusetts. Exercise participants included the Commonwealth of Massachusetts, the States of Vermont, New Hampshire, and New York, and the local emergency planning zone towns. The report was prepared by Region I of the Federal Emergency Management Agency (FEMA).

There were four deficiencies identified during this exercise. On August 24, 1988, a remedial exercise was held, which demonstrated the correction of the four deficiencies identified during the April 26 - 27, 1988, exercise. There were also forty-three areas requiring corrective action (ARCAs) identified in the April 1988 exercise.

Based on the results of the remedial exercise held August 24, 1988, and corrective actions scheduled or already taken by the participating state and local governments, FEMA considers that offsite radiological emergency preparedness is adequate to provide reasonable assurance that appropriate measures can be taken offsite to protect the health and safety of the public living in the vicinity of the Yankee Rowe Nuclear Power Plant in the event of a radiological emergency.

If you have any questions, please contact me on 646-2871.

Sincerely,

Dennis H. Kwiatkowski

Dennis H. Kwiatkowski
Assistant Associate Director
Office of Natural and Technological
Hazards

Enclosure
As Stated

8809060150
IP

FINAL EXERCISE ASSESSMENT

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

ROWE, MASSACHUSETTS

April 26-27, 1988

Federal Emergency Management Agency

Region I

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

YANKEE ROWE NUCLEAR POWER PLANT

LICENSEE: Yankee Atomic Electric Company

LOCATION: Rowe, Massachusetts

DATE OF REPORT: August 20, 1990

DATE OF EXERCISE: April 26-27, 1988

PARTICIPANTS:

Commonwealth of Massachusetts
Town of Buckland, Mass.
Town of Charlemont, Mass.
Town of Clarksburg, Mass.
Town of Colrain, Mass.
Town of Florida, Mass.
Town of Greenfield, Mass.
Town of Hawley, Mass.
Town of Heath, Mass.
Town of Monroe, Mass.
City of North Adams, Mass.
Town of Rowe, Mass.
Town of Savoy, Mass.
Town of Williamstown, Mass.

State of Vermont
Town of Halifax, Vt.
Town of Readsboro, Vt.
Town of Stamford, Vt.
Town of Whitingham, Vt.
Town of Wilmington, Vt.

State of New Hampshire

State of New York

NONPARTICIPANTS:

None

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TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

ANL	Argonne National Laboratory
ARC	American Red Cross
ARES	Amateur Radio Emergency Service
CAP	Civil Air Patrol
CD	civil defense
CDD	Civil Defense Director
CPR	Center for Planning and Research
DOC	U.S. Department of Commerce
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
EAL	emergency action level
EBS	Emergency Broadcast System
ECL	emergency classification level
EOC	emergency operations center
EOF	emergency operations facility
EPA	U.S. Environmental Protection Agency
EPZ	emergency planning zone
ETA	Educational Training Associates, Inc.
FCP	forward control point
FDA	U.S. Food and Drug Administration
FEMA	Federal Emergency Management Agency
HHS	U.S. Department of Health and Human Services
IFO	incident field office
INEL	Idaho National Engineering Laboratory
KI	potassium iodide
MCDA	Massachusetts Civil Defense Agency
MDPH	Massachusetts Department of Public Health
NaI	sodium iodide
NAS	Nuclear Alerting System
NAWAS	National Warning System
NOAA	National Oceanic and Atmospheric Administration
NRC	U.S. Nuclear Regulatory Commission
NUREG-0654	NUREG-0654/FEMA-REP-1, Rev. 1 (*Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*)
OSC	operations support center
PA	protective action
PAG	protective action guideline
PAR	protective action recommendation
PIO	public information officer
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
RADEF	radiological defense

LIST OF ABBREVIATIONS AND ACRONYMS (Cont'd)

RERP	Radiological Emergency Response Plan
TLD	thermoluminescent dosimeter
TSC	technical support center
UPS	uninterruptible power supply
USDA	U.S. Department of Agriculture
VEM	Vermont Emergency Management
YRNPP	Yankee Rowe Nuclear Power Plant

cfm	cubic feet per minute
cpm	counts per minute
gpm	gallons per minute
mR	milliroentgen
mR/hr	milliroentgen per hour
Rem	roentgen equivalent man
Rad	radiation absorbed dose
μc/cc	microcuries per cubic centimeter

SUMMARY

The Commonwealth of Massachusetts and the States of New Hampshire, New York, and Vermont; the communities within the plume exposure emergency planning zone (EPZ) of the nuclear power plant in Rowe, Massachusetts; and the Yankee Rowe Nuclear Power Plant (YRNPP) participated on April 26 and 27, 1988, in an exercise of the plans and preparedness for off-site radiological emergency response. The exercise was evaluated by a team of 52 Federal evaluators. Following the conclusion of the two-day exercise, which consisted of both plume exposure and ingestion exposure pathway exercises, evaluators presented preliminary findings based on observations at their respective assigned locations. On April 28, 1988, briefings for the exercise participants and the general public were held at the public school in Rowe, Massachusetts.

Section 2 of this report presents the full evaluation and listings by jurisdiction of deficiencies and areas requiring corrective action, with the respective recommendations for corrective action, as well as areas recommended for improvement, which do not require corrective action. Section 3 summarizes in tabular form the deficiencies and areas requiring corrective action and provides a suggested format for the States and local jurisdictions to use in responding to the recommended corrective actions.

PLUME EXPOSURE PATHWAY EXERCISE

Commonwealth of Massachusetts Operations

The Commonwealth of Massachusetts operations involved the Massachusetts Emergency Operations Center (EOC) in Framingham, the Belchertown Area IV EOC, and Massachusetts field monitoring teams. The State demonstrated readiness for dealing with a radiological emergency with two exceptions: it failed to involve EOC staff members in the decision-making process; and the Massachusetts EOC staff did not follow public alerting and notification procedures for simulated activation of tone-alert radios and sirens prior to simulated release of Emergency Broadcast System (EBS) messages at both Site Area Emergency and General Emergency declaration, and also failed to coordinate with the Vermont EOC regarding EBS message content and siren and tone-alert radio activation.

The Massachusetts EOC was well suited for emergency operations. Staffing of the facility was accomplished in a timely manner; however, the YRNPP representative never appeared at the EOC. The Massachusetts Civil Defense Agency's (MCDA's) Director was the primary decision maker and manager of operations.

Communication resources and channels to contiguous states and other organizations were good. Both primary and backup systems were available and used in accordance with the State plan.

Technical analysis of plant and field data was accomplished during the exercise by the EOC representative at the Emergency Operations Facility (EOF). Protective actions (PAs) were decided upon by the MCDA Director and conveyed to the public.

The Area IV EOC at Belchertown demonstrated its ability to carry out emergency response operations. The Area IV Director was clearly in charge of the effort to coordinate assistance with the Massachusetts communities within the EPZ, to activate reception centers and to keep the Massachusetts Civil Defense Agency/Office of Emergency Preparedness in Framingham fully informed of activities in the EPZ communities. Area IV EOC radio broadcast procedures used to communicate with the EPZ communities were slow and confusing and impeded the radio traffic flow to the local EOCs. As a result, messages to Buckland, Charlemont, Clarksburg, and Colrain were delayed. A PA radioed to the Florida EOC was delayed about one half hour before the message got through. This issue was identified as a deficiency and corrected during a remedial exercise conducted on August 24, 1988.

Massachusetts deployed two field monitoring teams during the exercise. The utility maintains all instruments required for field monitoring at the Buckland EOF solely for use by State personnel. The teams, which were well supplied with equipment, adequately demonstrated their ability to detect radioiodines in the plume.

The vehicles used to transport the teams were inadequate for adverse weather conditions and all the expected terrains. Also, many "dead spots" with respect to radio communication were encountered.

Massachusetts Local Operations

The Massachusetts communities of Buckland, Charlemont, Clarksburg, Colrain, Florida, Greenfield, Hawley, Heath, Monroe, North Adams, Rowe, Savoy, and Williamstown participated in the exercise. Facilities and resources for operations were adequate at most local EOCs, with the exception of adequate displays at Heath and North Adams. The local EOCs were promptly activated and staffed largely by knowledgeable, enthusiastic, and dedicated volunteers.

Communications equipment, both primary and backup, was generally adequate at the EOCs, with the exception of Savoy, which lacked sufficient telephones and telephone lines.

Evacuation of the public was simulated in the two affected communities of Florida and Monroe. Staff members at the local EOCs were knowledgeable about evacuation procedures and traffic control points and had sufficient resources to handle whatever problems occurred during evacuation.

Knowledge of radiological exposure control procedures was adequate in most local EOCs, except at North Adams, where the staff was not knowledgeable on the use of dosimetry and KI. Sufficient dosimetry and KI were available at the local EOCs.

Massachusetts Reception Centers

The Massachusetts host communities of Greenfield and Williamstown participated in the exercise. The facilities provided were well equipped to serve as

reception centers, with the exception of the protective floor coverings at the Williamstown Reception Center. Activation and staffing by the American Red Cross and other personnel were timely.

Communication systems at the reception centers worked well. When two staff members arrived from the Heath EOC, which represented a simulated relocation of the EOC, communication operations were maintained from the Greenfield Reception Center.

Evacuees were adequately registered and provided with shelter at the reception centers. Monitoring of evacuees and vehicles was conducted; however, the monitors need additional training in radiological monitoring and decontamination procedures. In addition, the Greenfield Reception Center had only one appropriate radiation monitoring instrument, and it belongs to the local fire department.

State of Vermont Operations

The State of Vermont operations involved the Vermont EOC, the Dummerston Incident Field Office (IFO), and Vermont field monitoring teams. The State demonstrated an adequate level of readiness for dealing with a radiological emergency.

The Vermont EOC was well equipped, with adequate resources and facilities. Staff members were knowledgeable and actively participated in the exercise. The Public Safety Commissioner was effectively in charge of EOC operations and conducted numerous briefings during the exercise.

Communication resources and channels to other participating States and organizations were good. Primary and backup systems were available and used during the exercise. The communications equipment worked well.

The dose projection capabilities of Vermont were not directly demonstrated in part because the prevailing winds were away from the State and because dose projections were made primarily at the Brookland ECF by a radiological health team representing the State.

The prompt interstate coordination with the Massachusetts EOC was evident with [illegible] being disseminated to the public. On more than one occasion, the Massachusetts EOC advised Vermont that it was broadcasting or about to broadcast EBS [illegible] without prior consultation. The Massachusetts EBS station (WTSA) is not even heard in some Vermont towns.

The Dummerston IFO was activated after the Alert notification was received and was staffed in a timely manner. The IFO Director effectively managed and controlled operations at the Dummerston IFO.

Communication resources at the Dummerston IFO were excellent. The recent addition of a telefacsimile system considerably enhanced operations. However, only one person was available for operating the communication systems.

The State of Vermont deployed two field monitoring teams to the Dummerston IFO, where they simulated being dispatched to the field. The teams were supplied with equipment; however, the air-sampling pumps provided in the kits were inadequate. It would have taken four and one-half hours to collect a proper air sample for radioiodine detection.

The field monitoring team members were generally knowledgeable; however, they should receive additional training on proper techniques for decontaminating equipment and preventing contamination and cross-contamination while procuring samples.

Vermont Local Operations

The Vermont communities of Halifax, Readsboro, Stamford, Whitingham, and Wilmington participated in the plume exposure pathway exercise. Operating facilities and resources were adequate at the local EOCs, except for those at Halifax and Readsboro, where status boards were available but were not used during the exercise. In addition, the Whitingham EOC staff was unable to locate the map showing population data by evacuation area.

The local EOCs generally were promptly activated, except in Readsboro. They were generally staffed by knowledgeable and dedicated volunteers. In Readsboro, however, the EOC staff should receive additional training in radiological emergency response procedures. Problems were also encountered in the activation of the EOC, at the Alert notification.

Communications equipment, both the primary and backup systems, were adequate and generally worked well with several exceptions. The Readsboro EOC had some difficulty in communicating with field emergency workers. In addition, the Stamford and Whitingham EOCs experienced some difficulty when unclear messages were received from the Vermont EOC.

Adequate supplies of dosimetry equipment and KI were available at the local EOCs. Staff members were knowledgeable about the use of the equipment; however, the Radiological Defense Officer at Whitingham should receive additional training in radiological exposure control procedures.

Emergency Operations Facility

The EOF at Buckland, Massachusetts, was well equipped, with adequate resources and facilities. Staff members were knowledgeable and participated actively in the exercise.

Communication resources were adequate and worked well, with the exception of the Massachusetts Field Coordinator's radio link with the Massachusetts field monitoring teams. Representatives from the States of Massachusetts and Vermont were kept

informed of activities by YRNPP personnel, and information was transmitted to the two State EOCs in a timely manner.

Both states used the METPAC computer system to perform dose projections. Protective action recommendations (PARs) were made by the utility; as soon as the State representatives concurred, the PAR information was transmitted to the respective State EOCs.

Media Center

The Media Center was activated and staffed in a timely and realistic manner. The facilities were generally good, except that available electrical outlets were inadequate for the computers and television camera lighting. In addition, emergency backup power was not available at the Media Center.

Communication systems at the Media Center were generally adequate, except that only three telephone lines were available for reporters. All systems functioned well. Radios and a television set were available for monitoring, but were not actively monitored.

The informational functions of the Media Center generally were performed very well. The numerous full-scale briefings held were both timely and informative. Many charts and displays were used effectively; however, the status board was never used to brief the media. In addition, the Media Center staff spent virtually no time conferring in advance of each news briefing, which resulted in extemporaneous and poorly organized presentations.

Although the Vermont Public Information Officer (PIO) did not distribute EBS messages in the Media Center, the messages were available in the PIO working area. Unfortunately, the first Vermont news release erroneously identified the cause of the Alert declaration by the utility.

INGESTION EXPOSURE PATHWAY EXERCISE

On April 27, 1988, a test of the ingestion exposure pathway (50-mile) EPZ was conducted for all four States. The Dummerston IFO and the Belchertown Area IV EOC were not activated. Also, the Media Center and all previously participating local EOCs remained inactive during this portion of the exercise.

State EOC Operations

The Massachusetts, New Hampshire, New York, and Vermont EOCs participated in this portion of the exercise and were adequately staffed with sufficiently knowledgeable representatives from various State departments and agencies.

PA decisions were generally based on laboratory results of field samples taken during the initial phase of this exercise. Assessment of laboratory results was timely, professional, and well coordinated, and decisions were effective and timely. PAs were communicated to the public via the EBS.

Interactions among the various departments and agencies at the State EOCs were effective. The long-term aspects of the recovery and reentry process were covered sufficiently well to show that the process would effectively protect the health and safety of the public.

The State EOCs had adequate information available about farmers and agribusinesses within their jurisdictions. They were also able to identify additional commodities that might be at risk had the exercise been conducted during a different season.

Press releases were developed at the State EOCs because the Media Center had not been activated.

Overall, the Massachusetts, New Hampshire, New York, and Vermont EOCs adequately demonstrated their ability to conduct an ingestion exposure pathway exercise.

State Laboratories

The Massachusetts State laboratory in Jamaica Plain and the Massachusetts contractor laboratory in Westboro were observed during the exercise. Their respective staffs were knowledgeable and participated enthusiastically in the exercise.

Adequate procedures for operating equipment were available only at the Westboro laboratory. Samples were analyzed on the radiological counting equipment, which was adequate. However, the Massachusetts State laboratory does not have the ability to analyze for strontium.

The Jamaica Plain laboratory staff needs additional training in contamination control procedures for processing environmental samples for radioactivity measurements. In addition, the laboratory was without telephone service during much of the exercise. It responded by telefaxing analytical data to its State office in Boston, which then relayed the data to the Massachusetts EOC. The phone system was eventually repaired and telephone contact with the Massachusetts EOC was reestablished.

State Field Sampling

Massachusetts dispatched two field sampling teams from the Buckland EOF. The utility provided complete sets of all instruments and equipment for field monitoring and sampling; however, one team left the instrument kit at the EOF. The kit contained direct-reading dosimeters and certain personal protective clothing.

Field team members were knowledgeable and demonstrated excellent sampling techniques and contamination control. They showed good judgment in deciding where to collect vegetation samples. Communication problems still existed during the exercise between field sampling teams and the Buckland EOF.

Emergency Operations Facility

The Buckland EOF was operational and sufficiently staffed. The Massachusetts Field Team Coordinator demonstrated his ability to properly analyze and prioritize field sampling team activities. The States and YRNPP representatives demonstrated excellent cooperation in exchanging technical information and PA decision making.

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 planning for accidents at commercial nuclear power plants. FEMA's immediate 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 radiological emergency response plans (RERPs) 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:

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

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

Emergency plans for the Yankee Rowe Nuclear Power Plant (YRNPP) in Rowe, Massachusetts, were formally submitted to FEMA by the Commonwealth of Massachusetts and the States of New Hampshire and Vermont, and involved local jurisdictions. Submission of the plans was followed closely by the exercising (March 25, 1982), critiquing, and evaluating of the plans. A public meeting was held to acquaint the public with the contents of the plans, answer questions about them, and receive suggestions on the plans.

Additional radiological emergency exercises were conducted on April 6, 1983, August 22, 1984, June 11, 1986, and April 26-27, 1988, to reassess the adequacy of the State and local emergency preparedness organizations and their ability to protect the public in a radiological emergency involving the YRNPP.

An evaluator team consisting of FEMA personnel, RAC members, and support personnel from Federal agencies and contractors evaluated the April 26-27, 1988,

exercise. Fifty-two evaluators were assigned to evaluate State, local, and field activities. The evaluators are trained in radiological emergency response and exercise evaluation. They were given evaluation kits containing information on the exercise objectives, exercise scenario, previously identified deficiencies and areas requiring corrective action, and other pertinent data. Team leaders coordinated evaluator activities and consolidated the findings.

After the exercise, the Federal evaluators 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 on April 28, 1988, at the public school in Rowe, Massachusetts.

The findings presented in this report were derived from the Federal evaluators' reports and were reviewed by the RAC Chairman of FEMA Region I and the Radiological Emergency Planning Task Force. FEMA requests that State and local jurisdictions take remedial actions in response to each of the deficiencies and areas requiring corrective action indicated in this report. To that end, the States should submit a schedule for addressing the identified deficiencies and areas requiring corrective action within 30 calendar days of receiving the report. 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 and areas requiring corrective action observed during the exercise have been corrected and that such corrections have been incorporated into the State and local RERPs, as appropriate.

1.2 FEDERAL EVALUATORS

Fifty-two Federal evaluators participated in evaluating the exercise. These individuals, their affiliations, and their observation locations are given below.

Plume Exposure Pathway Exercise
April 26, 1988

Evaluator	Agency	Location
Jack Dolan	FEMA[a]	General Observations
Kevin Merli	FEMA	General Observations
Henry Vickers	FEMA	General Observations
Joseph Keller, Team Leader	INEL[b]	Massachusetts Emergency Operations Center (EOC)
William Serrano	INEL	Massachusetts EOC
Anna Hart	USDA[c]	Massachusetts EOC

Evaluator	Agency	Location
David Schweller	ANL[d]	Massachusetts EOC
Thomas Carroll	ANL	Belchertown Area IV EOC
Byron Keene, Team Leader	EPA[e]	Emergency Operations Facility (EOF)
Frederick Carlson	ANL	EOF
Craig Conklin	NRC[f]	EOF
Kenneth Horak, Team Leader	FEMA	Media Center
Robert Irvine	ETA[g]	Media Center
Charles Lang	ETA	Media Center
Michael Leal, Team Leader	FDA[h]	Massachusetts Field Monitoring
Neil Gaeta	ANL	Massachusetts Field Monitoring
Carl Hunckler	ANL	Williamstown, Mass., Reception Center
Frank Wilson	ANL	Williamstown, Mass., Reception Center
Jerry Staroba, Team Leader	ANL	Greenfield, Mass., Reception Center
Alice Adams	ARC[i]	Greenfield, Mass., Reception Center
James Karvelas	ANL	Greenfield, Mass., Reception Center
William Creamer, Team Leader	FEMA	Rowe, Mass., EOC
James Gibbons	FEMA	Rowe, Mass., EOC
Kenneth Picel	ANL	Colrain, Mass., EOC
Daniel Catlett	FEMA	Colrain, Mass., EOC
Michael Lazaro	ANL	Heath, Mass., EOC
Elizabeth Dionne	FEMA	Charlemont, Mass., EOC
Christine Klimczak	ANL	Buckland, Mass., EOC
Stephen Meleski	ANL	Hawley, Mass., EOC
Jack Quinlan, Team Leader	FEMA	Monroe, Mass., EOC
Steven Borth	FEMA	Monroe, Mass., EOC
Edward Robinson	ANL	Clarksburg, Mass., EOC

Evaluator	Agency	Location
Linda Zander	ANL	Clarksburg, Mass., EOC
Russell Peters	FEMA	Florida, Mass., EOC
Alan Justus	ANL	North Adams, Mass., EOC
Frank D'Amore	FEMA	Savoy, Mass., EOC
Frederick Oleson, Team Leader	CPR[j]	Vermont EOC
Joshua Moore	ANL	Vermont EOC
Ned Smith	ANL	Vermont EOC
Robert Neisius	ANL	Vermont Incident Field Office (IFO), Dummerston
Marty Simonin, Team Leader	ANL	Vermont Field Monitoring
Joseph Ello	ANL	Vermont Field Monitoring
Michael Goetz, Team Leader	FEMA	Stamford, Vt., EOC
Kaye Franchi	FEMA	Stamford, Vt., EOC
Arvind Teotia	ANL	Readsboro, Vt., EOC
Julie Muzzarelli	ANL	Readsboro, Vt., EOC
George Hatch	FEMA	Wilmington, Vt., EOC
Howard Rhude	ANL	Whitingham, Vt., EOC
Vassilios Stamoudis	ANL	Halifax, Vt., EOC
Albert Lookabaugh	ANL	Halifax, Vt., EOC

Ingestion Exposure Pathway Exercise
April 27, 1988

Evaluator	Agency	Location
Kevin Merli	FEMA	General Observations
Jack Dolan	FEMA	General Observations
Anna Hart	USDA	Massachusetts EOC

Evaluator	Agency	Location
Thomas Carroll	ANL	Massachusetts EOC
David Schweller	ANL	Massachusetts EOC
Byron Keene, Team Leader	EPA	EOF
Frederick Carlson	ANL	EOF
Craig Conklin	NRC	EOF
Michael Leal, Team Leader	FDA	Massachusetts Field Sampling
Neil Gaeta	ANL	Massachusetts Field Sampling
Joseph Keller, Team Leader	INEL	Massachusetts Laboratory, Jamaica Plain
William Serrano	INEL	Massachusetts Laboratory, Westboro
Fred Oleson, Team Leader	CPR	Vermont EOC
Joshua Moore	ANL	Vermont EOC
Ned Smith	ANL	Vermont EOC
Albert Lookabaugh, Team Leader	ANL	New Hampshire EOC
Frank Wilson	ANL	New Hampshire EOC
Stephen Meleski	ANL	New Hampshire EOC
Samuel Nelson	ANL	New York EOC

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[a]FEMA: Federal Emergency Management Agency.

[b]INEL: Idaho National Engineering Laboratory.

[c]USDA: U.S. Department of Agriculture.

[d]ANL: Argonne National Laboratory.

[e]EPA: U.S. Environmental Protection Agency.

[f]NRC: U.S. Nuclear Regulatory Commission.

[g]ETA: Educational Training Associates, Inc. (contract employee).

[h]FDA: U.S. Food and Drug Administration.

[i]ARC: American Red Cross.

[j]CPR: Center for Planning and Research (contract employee).

1.3 EXERCISE OBJECTIVES

During the exercise, emergency response was evaluated for both the 10-mile plume exposure pathway and the 50-mile ingestion exposure pathway. The objectives listed below indicate the specific capabilities that were to be demonstrated during the exercise by the indicated State or local jurisdiction.

1.3.1 Massachusetts Objectives

1. Demonstrate the ability to monitor and use Emergency Classification Levels (ECLs) through the appropriate implementation of emergency functions and activities corresponding to each ECL. The four ECLs are Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency.

   State: Massachusetts Civil Defense Agency (MCDA) and Massachusetts Department of Public Health (MDPH) representatives will report at the Alert ECL to the EOF, monitor activities, and independently assess emergency functions and activities corresponding to each ECL for State EOC personnel at Framingham, Mass.

   Local: The local EOCs will be activated at the Alert ECL and will perform emergency response functions in accordance with standard procedures.

2. Demonstrate the ability to fully alert, mobilize, and activate personnel for both facility and field-based emergency functions.

   State: Emergency response personnel will be notified, and they will report to the EOF in Buckland, Mass., and the State EOC.

   Local: Emergency response personnel for all towns in the EPZ will be mobilized and activated at the Alert ECL.

3. Demonstrate the ability to direct and control emergency activities.

   State: Emergency activities will be directed from the State EOC.

   Local: Local emergency response activities will be directed from the local EOCs.

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

   All: Communication links will be established between the State EOC, EOF, local EOCs, Belchertown Area IV EOC, and field personnel.

5. Demonstrate the adequacy of facilities and displays to support emergency operations.

   All: The EOCs will be activated and staffed, and the adequacy of the facilities and displays will be demonstrated.

6. Demonstrate the ability to continuously monitor and control emergency worker exposure.

   State: Field teams will be dispatched from the EOF and their exposure monitored.

   Local: Emergency workers will be monitored according to local plans.

7. Demonstrate the ability to make the decision to provide potassium iodide (KI) to emergency workers and institutionalized persons, based on predetermined criteria, as well as to distribute and administer it once the decision is made, if necessitated by radioiodine releases.

   All: The decision to administer KI will be made by the Commissioner of Public Health and communicated to MCDA and the local EOCs as necessary.

8. Demonstrate the ability to make the decision, if the state plan so specifies, to provide KI to the general public, based on predetermined criteria, as well as to distribute and administer it once the decision is made, if necessitated by radioiodine releases.

   State: This is the Commissioner of Public Health's decision; currently, the state policy is not to administer KI to the general public. No action.

9. Demonstrate the ability to mobilize and deploy field monitoring teams in a timely fashion.

   State: Field monitoring teams will be dispatched from the EOF to monitoring locations.

10. Demonstrate appropriate equipment and procedures for determining ambient radiation levels.

    State: Field monitoring teams will demonstrate the use of equipment used for determining ambient radiation levels.

11. Demonstrate appropriate equipment and procedures for the measurement of airborne radioiodine concentrations as low as 10^{-7} microcurie per cubic centimeter (cc) in the presence of noble gases.

    State: Field monitoring teams will obtain an air sample and analyze the filter cartridge for radioiodine. The equipment used is capable of a 10^{-7} microcurie per cc accuracy in the presence of noble gases.

12. Demonstrate the ability to obtain samples of the particulate activity in the airborne plume, and perform laboratory analyses so that projections can be made of the area requiring relocation.

    State: Field teams will demonstrate the ability to obtain a particulate filter sample and count the sample in the field.

13. Demonstrate the ability, within the plume exposure pathway, to project dosage to the public via plume exposure, based on plant and/or field data.

    State: Radiological assessment will be performed by emergency response personnel in the EOF.

14. Demonstrate the ability to make appropriate protective action (PA) decisions based on projected or actual dosage, protective action guidelines (PAGs), availability of adequate shelter, evacuation time estimates, and all other relevant factors.

    State: MDPH and MCDA will take appropriate PAs for the public in the plume exposure EPZ.

15. Demonstrate the ability to implement PAs for the general public for plume exposure pathway hazards.

    All: No actual evacuation of the general public will occur. Recommendations will be communicated to the local EOCs.

16. Demonstrate the ability to alert the public within the 10-mile EPZ and disseminate an initial instructional message (e.g., via Emergency Broadcast System [EBS]) within 15 minutes.

    State: The EBS message will be drafted at the State EOC. A standard EBS test message will be broadcast.

17. Demonstrate the ongoing ability to formulate and disseminate appropriate information and instructions to the public in a timely fashion once the initial instructional message is disseminated.

    State: The draft EBS message will be updated as necessary.

18. Demonstrate the ability to provide advance coordination of information and instructions released, both for initial and ongoing messages.

    State: Appropriate plans and procedures for the release of instructions and information will be demonstrated.

19. Demonstrate the ability to brief the media in a clear, accurate, and timely manner.

    State: The State of Massachusetts will send public information representatives to the Media Center (Oxbow Motel).

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

    State: The State of Massachusetts will staff the "800" rumor-control number.

21. Demonstrate the organizational ability and resources necessary to control evacuation traffic flow under normal conditions and with both weather- and traffic-related impediments to evacuation, and to control access to evacuated and sheltered areas.

    All: The State and local EOCs will demonstrate their ability to handle traffic impediments during the radiological emergency.

22. Demonstrate the adequacy of procedures for the registration and radiological monitoring of evacuees.

    All: Reception centers will be activated, and a select number of individuals will be registered and monitored.

23. Demonstrate the adequacy of facilities for mass (congregate) care of evacuees.

    All: Appropriate organizations will be available to discuss congregate care arrangements for evacuees.

24. Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment, and vehicles.

    Local: A town will be selected to demonstrate vehicle decontamination; another town will be selected to demonstrate emergency worker decontamination.

25. Demonstrate the ability to relocate to, and operate from, an alternate EOC if the EOC is within the plume EPZ.

    Local: One local EOC will relocate to the appropriate reception center.

26. Demonstrate the ability to identify the need for, effectively call upon, and utilize Federal and other outside support agencies' assistance.

    State: The State of Massachusetts will call upon appropriate Federal and other support agencies for assistance.

27. Demonstrate the ability to determine and implement appropriate measures for controlled reentry and recovery.

    State: The State of Massachusetts will demonstrate recovery immediately following the plume exposure pathway and reentry as part of ingestion pathway activities.

28. Demonstrate the ability to estimate total population exposure.

    State: The State representative will estimate total population exposure.

29. Demonstrate the ability to make decisions on the reentry of evacuated persons, based on estimated total population exposure and relocation PAGs.

    State: A discussion addressing reentry and total population exposure will be conducted during the exercise.

30. Demonstrate the ability to carry out emergency functions and activities during off hours (i.e., between 6:00 p.m. and 4:00 a.m.).

All: An off-hours exercise will be conducted during the week of April 24.

31. Demonstrate the ability to carry out emergency functions and activities during an unannounced exercise.

All: An off-hours exercise will be conducted during the week of April 24.

32.* Demonstrate the ability to project dosage to the public via ingestion pathway exposure and to determine appropriate protective measures, based on PAGs and other relevant factors.

State: Field data and laboratory analysis will be presented at the EOF and the Massachusetts laboratory in Jamaica Plain, respectively; the information will then be communicated to the State EOC. Doses will be projected and decisions made based on the results.

33.* Demonstrate the ability to implement both preventive and emergency PAs for ingestion pathway hazards.

State: EBS messages will be developed as applicable.

34.* Demonstrate appropriate equipment and procedures for collection and transport of samples of soil, vegetation, snow, water, and milk.

State: Environmental sample collection will be coordinated in the morning from the Buckland EOF.

35.* Demonstrate appropriate laboratory operation functions for measuring and analysis of samples of soil, vegetation, snow, water, and milk.

State: Laboratory samples will be presented to the laboratory personnel for analysis in the afternoon at the Jamaica Plain Laboratory (Mass.) and Yankee Environmental Laboratory (Westboro, Mass.).

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*An asterisk indicates the objectives to be demonstrated during the ingestion exposure pathway part of the exercise.

1.3.2 Vermont Objectives

1. Demonstrate the ability to monitor and use ECLs through the appropriate implementation of emergency functions and activities corresponding to each ECL. The four ECLs are: Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency.

   State: All ECLs will be generated through the State EOC.

   Local: Yes; all EPZ towns.

2. Demonstrate the ability to fully alert, mobilize, and activate personnel for both facility- and field-based emergency functions.

   State: The State EOC, IFO, and Media Center were previously tested. Will be demonstrated by the field teams only.

   Local: The towns of Halifax, Stamford, Wilmington, Readsboro, and Whitingham were previously tested. Will be demonstrated at Stamford.

3. Demonstrate the ability to direct and control emergency activities.

   State: Will be demonstrated at the IFO only.

   Local: Was previously demonstrated.

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

   State: Will be demonstrated at State EOC and IFO only.

   Local: Was previously demonstrated.

5. Demonstrate the adequacy of facilities and displays to support emergency operations.

   State: Will be demonstrated by the field teams only.

   Local: Was previously demonstrated.

6. Demonstrate the ability to continuously monitor and control emergency worker exposure.

   State: Will be demonstrated at the State EOC only.

Local: Was previously demonstrated.

7. Demonstrate the ability to make the decision to provide KI to emergency workers and institutionalized persons, based on predetermined criteria, as well as to distribute and administer it once the decision is made, if necessitated by radioiodine releases.

   State: The health aspect will be simulated.

   Local: Not applicable.

8. Demonstrate the ability to make the decision, if the state plan so specifies, to provide KI to the general public, based on predetermined criteria, as well as to distribute and administer it once the decision is made, if necessitated by radioiodine releases.

   State: The health aspect will be simulated.

   Local: Not applicable.

9. Demonstrate the ability to mobilize and deploy field monitoring teams in a timely fashion.

   State: Will be demonstrated at the IFO, with the field teams in a supporting role.

   Local: Not applicable.

10. Demonstrate appropriate equipment and procedures for determining ambient radiation levels.

    State: Will be demonstrated by the field teams only.

    Local: Not applicable.

11. Demonstrate appropriate equipment and procedures for the measurement of airborne radioiodine concentrations as low as 10^{-7} microcurie per cc in the presence of noble gases.

    State: No; was demonstrated in December 1987.

    Local: Not applicable.

12. Demonstrate the ability to obtain samples of the particulate activity in the airborne plume, and perform laboratory analyses so that projections can be made of the area requiring relocation.

    State: Was demonstrated in December 1987; will be simulated by field teams, with a laboratory in a supporting role.

    Local: Not applicable.

13. Demonstrate the ability within the plume exposure pathway to project dosage to the public via plume exposure, based on plant and/or field data.

    State: Will be demonstrated by the State EOC only; the health METPAC operation will be simulated.

    Local: Not applicable.

14. Demonstrate the ability to make appropriate PA decisions based on projected or actual dosage, PAGs, availability of adequate shelter, evacuation time estimates, and all other relevant factors.

    State: Will be demonstrated at the State EOC only.

    Local: Not applicable.

15. Demonstrate the ability to implement PAs for the general public (including transit-dependent persons), special needs populations, handicapped persons, and institutionalized persons for plume pathway hazards

    All: Will be demonstrated in a separate exercise later in 1988.

16. Demonstrate the organizational ability and resources necessary to implement PAs (i.e., sheltering, evacuation, or early dismissal) for school children within the plume EPZ.

    All: Will be demonstrated in a separate exercise later in 1988.

17. Demonstrate the ability to alert the public within the 10-mile EPZ and disseminate an initial instructional message (e.g., via EBS) within 15 minutes.

    State: EBS will be activated to broadcast one drill message.

    Local: The local EOCs will participate.

18. Demonstrate the ongoing ability to formulate and disseminate appropriate information and instructions to the public in a timely fashion once the initial instructional message is disseminated.

    State: Messages will be drafted and updated as necessary.

    Local: An instructional message will be provided.

19. Demonstrate the ability to provide advance coordination of information and instructions released, both for initial and ongoing messages.

    State: Will be demonstrated at the State EOC and Media Center.

    Local: Not applicable.

20. Demonstrate the ability to brief the media in a clear, accurate, and timely manner.

    State: Will be demonstrated at the State EOC and Media Center.

    Local: Not applicable.

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

    State: Will not be demonstrated during this exercise.

    Local: Not applicable.

22. Demonstrate the organizational ability and resources necessary to control evacuation traffic flow under normal conditions and with both weather- and traffic-related impediments to evacuation, and control access to evacuated and sheltered areas.

    State: Was demonstrated in 1982 and 1983; the State EOC will simulate this objective with the local EOCs.

    Local: Was demonstrated by Halifax, Stamford, and Whitingham in 1982; will be partially demonstrated in this exercise.

23. Demonstrate the adequacy of procedures for the registration and radiological monitoring of evacuees.

    State: Was demonstrated in 1982.

    Local: Not applicable.

24. Demonstrate the adequacy of facilities for mass care of evacuees.

State: Yes; only the relocation center will be simulated.

Local: Not applicable.

25. Demonstrate the adequacy of ambulance or other nonspecialized transportation resources and procedures for handling contaminated, injured, or exposed individuals.

State: Will not be demonstrated during this exercise.

Local: Not applicable.

26. Demonstrate the adequacy of hospital facilities, and procedures for handling contaminated, injured, or exposed individuals.

State: Will not be demonstrated during this exercise.

Local: Not applicable.

27. Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment, and vehicles.

State: Will not be demonstrated during this exercise.

Local: Not applicable.

28. Demonstrate the ability to relocate to, and operate from, an alternate EOC, if the original EOC is within the plume EPZ.

State: Will not be demonstrated during this exercise.

Local: Not applicable.

29. Demonstrate the ability to identify the need for, effectively call upon, and utilize Federal and other outside support agencies' assistance.

State: Will not be demonstrated during this exercise.

Local: Not applicable.

30.* Demonstrate the ability to project dosage to the public via ingestion pathway exposure and to determine appropriate protective measures, based on PAGs and other relevant factors.

State: Will be demonstrated through State EOC simulation. Personnel participation will be limited; Vermont Emergency Management (VEM) will receive information and discuss actions with the evaluator. Vermont determinations of PAGs will be based primarily on Vermont Laboratory test results.

Local: Not applicable.

31.* Demonstrate the ability to implement both preventive and emergency PAs for ingestion pathway hazards.

State: Will be demonstrated through State EOC simulation. A VEM representative will be available to discuss implementation of PAs with the FEMA evaluator(s).

Local: Not applicable.

32. Demonstrate appropriate equipment and procedures for collection and transport of samples of soil, vegetation, snow, water, and milk.

State: Will be demonstrated through simulation by the State EOC and field team procedures. The State of Vermont will verify these capabilities for the FEMA evaluator(s) by discussion and presentation of a sampling kit for review at the State EOC.

Local: Not applicable.

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*An asterisk indicates the objectives to be demonstrated during the ingestion exposure pathway part of the exercise.

33.* Demonstrate appropriate laboratory operation functions for measuring and analysis of samples of soil, vegetation, snow, water, and milk.

State: Will be demonstrated through simulation by the State EOC and State laboratory procedures. The State of Vermont will verify these capabilities for the FEMA evaluator(s) by discussion and presentation of the appropriate procedures for review at the State EOC.

Local: Not applicable.

34. Demonstrate the ability to determine and implement appropriate measures for controlled reentry and recovery.

State: Will not be demonstrated during this exercise.

Local: Will not be demonstrated during this exercise.

35. Demonstrate the ability to estimate total population exposure.

State: Will be demonstrated during this exercise.

Local: Not applicable.

36. Demonstrate the ability to make decisions on reentry of evacuated persons, based on estimated total population exposure and relocation PAGs.

State: Will not be demonstrated during this exercise.

Local: Not applicable.

37. Demonstrate the ability to maintain staffing on a continuous, 24-hour basis through an actual shift change.

State: Will not be demonstrated during this exercise.

Local: Will not be demonstrated during this exercise.

38. Demonstrate the ability to carry out emergency functions and activities during off hours (i.e., between 6:00 p.m. and 4:00 a.m.).

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*An asterisk indicates the objectives to be demonstrated during the ingestion exposure pathway part of the exercise.

State: Will be demonstrated during this exercise.

Local: Will be demonstrated during this exercise.

1.3.3 New Hampshire Objectives

1.* Demonstrate appropriate equipment and procedures for collection, transport, and analysis of samples of soil, vegetation, snow, water, and milk.

State: The State of New Hampshire will verify these capabilities for the FEMA evaluator(s) by discussion and presentation of procedures and a sampling kit for review at the State EOC.

Local: Not applicable.

2.* Demonstrate appropriate laboratory operation functions for measuring and analyzing all types of samples.

State: The State of New Hampshire will verify these capabilities for the FEMA evaluator(s) by discussion and presentation of appropriate procedures for review at the State EOC.

Local: Not applicable.

3.* Demonstrate the ability to project dosage to the public via ingestion pathway exposure, and to determine appropriate protective measures, based on PAGs and other relevant factors.

State: The State of New Hampshire will verify these capabilities through discussions with the FEMA evaluator(s). The State EOC will receive field data and general information and will discuss protective measures.

Local: Not applicable.

4.* Demonstrate the ability to implement both preventive and emergency PAs for ingestion pathway hazards.

State: The State of New Hampshire will discuss the potential ingestion exposure pathway hazards and the implementation of protective measures with the FEMA evaluator(s).

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*An asterisk indicates the objectives to be demonstrated during the ingestion exposure pathway part of the exercise.

Local: Not applicable.

1.3.4 New York Objectives

1.* Demonstrate the ability to project dosage to the public via ingestion pathway exposure and to determine appropriate protective measures, based on PAGs and other relevant factors.

State: Dose assessment personnel will describe the methodology to project potential ingestion pathway exposure. Depending on exercise data resulting from the scenario, the staff may demonstrate sample calculations and determine the need for protective action recommendations (PARs), if any.

Local: Not applicable.

2.* Demonstrate the ability to implement both preventive and emergency PAs for ingestion pathway hazards.

State: A representative from Command and Control will analyze the situation, including staff input primarily from Dose Assessment and Agriculture and Markets. If warranted, a decision will be issued to the respective agencies for implementation of PAs.

Local: Not applicable.

3.* Demonstrate appropriate equipment and procedures for collection and transport of samples of soil, vegetation, snow, water, and milk.

State: Deployment of field teams will be simulated. Equipment for ingestion exposure pathway sampling will be exhibited at the State EOC. The procedures will be described primarily by representatives from the Departments of Health and Agriculture and Markets.

Local: Not applicable.

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*An asterisk indicates the objectives to be demonstrated during the ingestion exposure pathway part of the exercise.

4.* Demonstrate appropriate laboratory operation functions for measuring and analysis of samples of soil, vegetation, snow, water, and milk.

State: A representative from the Department of Health laboratories will be at the State EOC to describe operations for receiving and analyzing samples and reporting the results for ingestion samples.

Local: Not applicable.

5.* Demonstrate the ability to communicate with all appropriate locations.

State: Communications will primarily be limited to receipt of technical data from Massachusetts, primarily by high-speed telecopier (telephone).

Local: Not applicable.

1.4 EXERCISE SCENARIO

The scenario will begin about 4:45 p.m. on April 26, 1988, with the reactor operating at 100% of rated power. A refueling outage will have ended two weeks ago. Initial plant and reactor system parameters will indicate normal, except for high turbine noise and some minor fluctuation in the main coolant pump current, which will have been intermittent over the past few days. An I&C technician will be investigating the loop 1 pressure-indicating response, which will have been inconsistent with the other readings.

About 4:50 p.m., a primary-to-secondary leak in the No. 3 steam generator will be confirmed by chemical sampling and analysis to be approximately 0.5 gallons per minute (gpm). The I&C investigation of the loop 1 pressure indicator will reveal that the indicator is faulty and must be replaced. Replacement will take approximately three hours. The shift supervisor will probably declare an Unusual Event, based on the reduction in plant mode required in accordance with technical specifications.

The shift supervisor may initiate a controlled power reduction, a controlled plant shutdown, or a manual scram. (Manual scram of the reactor will not be allowed at this time.)

About 5:55 p.m., the control room will receive indication of a Halon system "trouble" alarm in the switchgear room. Shortly after, the fire brigade should arrive at the switchgear room to find smoke coming from the uninterruptible power supply (UPS). It will also be apparent that the ventilation system in the switchgear room failed to isolate and that the Halon system failed to activate. Control room personnel should declare an Alert, based on the fire potentially affecting safety systems.

The Technical Support Center (TSC), Operations Support Center (OSC), Forward Control Point (FCP), and EOF will probably be activated and staffed. The affected States, NRC, and Yankee Nuclear Support Division will probably be notified.

By 6:15 p.m., the fire will be extinguished. Several wires will have been charred in the cable tray above the UPS cabinet where the fire apparently started; the outside of the rod control cabinet will also have been charred. A fire watch will be posted, and full damage will be assessed.

About 7:15 p.m., amperage fluctuations caused by pump vibration will again be evident in the main coolant pump.

About 7:30 p.m., a control rod will drop, caused by equipment malfunction in the fire-damaged cabinet. The neutron flux will decrease, and rod drop alarms and asymmetrical thermocouple readings will occur. Control room personnel should notify the TSC of this event.

About 7:45 p.m., a second dropped rod will result in a low pressure reactor scram signal. However, the reactor will fail to scram because of failure of the rod control system. Manual initiation of the reactor protection system will also fail. The operator will scram locally in the switchgear room. The steam line and air ejector monitors will alarm. Fuel cladding will be damaged because of mechanical and thermal stress. A Site Area Emergency should be declared at approximately 8:00 p.m. because of the transient requiring operation of the reactor protection system with no scram occurring.

About 8:50 p.m., loss of feedwater will occur because of a system fault. One or more steam generator tubes will rupture in the No. 3 steam generator, which will cause a leak of several hundred gallons per minute. Plant personnel will be unsuccessful in their attempts to isolate the No. 3 steam generator.

About 8:55 p.m., the heat of the fire will have compromised the wiring to the isolation valves in the switchgear room. No. 3 steam generator pressure will rise, and a safety relief valve will open and stick in the open position. A release path to the environment will now exist.

A General Emergency should be declared at approximately 9:15 p.m., based on projected doses exceeding 5 roentgen equivalent man (Rem) thyroid at the site boundary.

About 10:25 p.m., control room indications will show that the relief valve will have closed. The plant will stabilize, and the release of radioactive materials to the environment will terminate. Recovery discussions with the States should commence.

The plume exposure pathway exercise will end at approximately 10:45 p.m.

The ingestion exposure pathway exercise for the States of Massachusetts, New Hampshire, New York, and Vermont will begin on the morning of April 27, 1988, the day after the full-scale plume exposure pathway exercise. The State of Massachusetts will fully participate in ingestion-related activities by testing the capabilities that need demonstration. The States of New Hampshire, New York, and Vermont will participate

on a limited basis. They will monitor ingestion-related activities through their respective communication systems.

The second day of the exercise will start with initial plant conditions stable and no additional release of radioactive materials anticipated. All State EOCs will be simulated to have been manned on a 24-hour basis since the accident at the plant. Several local EOCs will be simulated to be staffed to support limited local activities.

Activities in the morning will center around collection and transportation of environmental samples for the State of Massachusetts. The Massachusetts field sampling teams will muster at their respective (local) field offices before being dispatched into the field. The State of Massachusetts will have a Field Team Coordinator at the field team muster area to coordinate the activities of the environmental monitoring teams. No actual staffing of the local EOCs will be necessary at this time. The actions of the Field Team Coordinator will represent the decisions that would have been made by the State EOC during the interim.

About 9:00 a.m., the State of Massachusetts field sampling teams will muster at the Buckland EOF. The teams should be briefed by the Field Team Coordinator on the type and location of samples being requested. A field team will be selected to rendezvous with another group to transport samples to a laboratory.

About 11:30 a.m., all facilities will be activated, and personnel participating in the ingestion exercise should be briefed. The samples collected in the morning will be integrated into the initial conditions for the start of the ingestion exposure pathway exercise.

About 12:00 p.m., the States will have been informed of the present conditions off site (48 hours after the release), and the decision-making portion of the exercise will begin. The latest field survey data available should indicate contamination levels in certain off-site locations.

The State of Massachusetts Laboratory Analysis Group will be provided with select environmental samples and will be asked to demonstrate certain measurement and analysis techniques. The Winchester Engineering Analytical Center should be requested to assist under the letter of agreement between the Center and MDPH.

About 12:15 p.m., the Massachusetts State laboratory results from the environmental samples will be communicated to the respective State EOCs. The sample results should indicate that several preventive and emergency PAGs will have been reached or exceeded between 2 and 15 miles at certain off-site locations. The State should use this information for PA decision making and dissemination of emergency information to the general public.

About 1:00 p.m., the States will evaluate and determine the radiological consequences from the ingestion exposure pathway.

About 1:30 p.m., PA decisions should be developed for the affected areas. Some coordination will be expected between the appropriate State governments on PAs that will be taken and the information to be disseminated to the public.

About 2:30 p.m., an EBS message or associated information for the public should be developed.

About 3:00 p.m., the EBS message or other related information for the public should be released and a long-term environmental sampling program for the ingestion exposure pathway should be discussed.

About 3:15 p.m., the ingestion exposure pathway exercise will terminate.

Table 1 gives the sequence of selected off-site events, showing the times the events occurred at all observed locations during the plume exposure pathway portion (day 1) of the exercise.

1.5 EVALUATION CRITERIA

The exercise evaluations presented in Sec. 2 are based on the applicable planning standards and evaluation criteria set forth in Sec. II of NUREG-0654, FEMA-REP-1, Rev. 1 (Nov. 1980). Following the narrative for each jurisdiction or activity, deficiencies, areas requiring corrective action, and areas recommended for improvement are presented with recommendations.

Deficiencies are demonstrated and observed inadequacies that would cause a finding that off-site emergency preparedness was not adequate to provide reasonable assurance that appropriate protective measures can be taken to protect the health and safety of the public living in the vicinity of a nuclear power facility in the event of a radiological emergency. Because of the potential impact of deficiencies on emergency preparedness, they are required to be promptly corrected through appropriate remedial actions, including remedial exercises, drills, or other actions.

Areas requiring corrective action are demonstrated and observed inadequacies of State and local government performances, and although their correction is required during the next scheduled biennial exercise, they are not considered, by themselves, to adversely impact public health and safety.

Areas recommended for improvement also are listed, as appropriate, for each jurisdiction or activity. These are problem areas observed during the exercise that are not considered to adversely impact public healthy and safety. Although not required, correction of these would enhance an organization's level of emergency preparedness.

TABLE 1 Sequence of Selected Off-Site Events and Observed Times (p.m.) for the Yankee Rowe Plume Exposure Pathway Exercise, April 26, 1988

Event	EOF	Media Center	Massachusetts State EOC	Massachusetts Area IV EOC	Massachusetts Buckland EOF
Alert	6:05	6:07	6:09	6:07	6:03
EOC activated	6:05	6:07	6:10	6:07	6:10
EOC operational					
Massachusetts	6:43	7:30	7:30	6:52	6:38
Vermont	8:01	8:15	7:30		
Site Area Emergency/ Public Notification	7:59	8:03	8:07	8:05	8:15
General Emergency/ Public Notification	9:15	9:20	9:22	9:24	9:30
EBS messages					
Massachusetts		8:25	8:20		
Vermont		9:07			
Massachusetts	-	9:20	8:30	-	-
Vermont		9:13			
Massachusetts		9:47			
Vermont		10:05			
Shelter					
Massachusetts	8:15	8:25	8:20		
Massachusetts	9:15	9:20	9:43		
Vermont	9:45	9:07	9:43	9:45	-
Vermont		10:20			
Evacuation	10:31	9:47	9:43	-	10:18
Access control	-	-	N/A	-	-
State of emergency	-	9:45	9:43	9:45	10:05
Exercise terminated	11:50	11:53	11:59	11:40	11:49

TABLE 1 (Cont'd)

Event	Massachusetts					
	Charlemont	Clarksburg	Colrain	Florida	Hawley	Health
Alert	6:09	6:20	6:18	6:20	6:13	6:15
EOC activated	6:15	6:35	6:18	6:20	6:13	6:27
EOC operational	6:25	7:10	6:34	6:30	6:24	6:48
Site Area Emergency/ Public Notification	8:15	8:18	8:16	8:15	8:15	8:18
General Emergency/ Public Notification	9:33	9:24	9:24	9:30	9:34	9:34
EBS messages	N/O	N/O	10:31	9:40	N/O	10:07
Shelter	10:10	-	-	9:45	9:25	9:38
Evacuation	-	-	-	10:15	-	-
Access control	-	-	10:20	9:45	-	-
State of emergency	10:05	10:00	10:05	10:05	10:07	10:05
Exercise terminated	11:46	11:50	11:52	11:40	11:45	11:45

TABLE 1 (Cont'd)

Event	Massachusetts					
					Reception Centers	
	Monroe	North Adams	Rowe	Savoy	Green-field	Williams-town
Alert	6:25	6:11	6:07	6:07	6:06	6:06
EOC activated	6:00	6:37	6:15	6:15	8:47	8:45
EOC operational	6:10	7:00	6:26	6:30	9:10	9:04
Site Area Emergency/ Public Notification	8:15	8:17	8:19	8:19	7:57	8:18
General Emergency/ Public Notification	9:33	9:35	9:32	9:34	9:22	9:35
EBS messages	N/O	N/O	N/O	N/O	N/O	N/O
Shelter	8:40	-	8:46	11:30	-	-
Evacuation	10:02	-	-	-	-	-
Access control	-	9:00	8:40	-	8:28	-
State of emergency	10:08	10:07	10:00	10:05	10:05	10:05
Exercise terminated	11:50	11:50	11:49	11:50	11:52	11:53

TABLE 1 (Cont'd)

Event	Vermont				
	State EOC	IFO	Halifax	Readsboro	Stamford
Alert	6:15	6:15	6:17	7:21	6:25
EOC activated	6:15	6:25	6:18	7:21	5:40
EOC operational	6:45	7:04	6:46	7:21	6:40
Site Area Emergency/ Public Notification	8:00	8:15	8:18	8:20	8:17
General Emergency/ Public Notification	9:28	9:35	9:36	9:34	9:36
EBS messages	7:20 8:50 9:08 9:34 10:45 11:30	N/O	9:36 10:46	N/O	7:19 9:36
Shelter	8:40 9:45 10:45	-	9:36	9:34 10:45	9:36 10:45
Evacuation	-	-	-	-	-
Access control	-	8:17	-	-	-
State of emergency	-	-	-	-	-
Exercise terminated	11:55	11:42	11:36	11:32	11:35

TABLE 1 (Cont'd)

Event	Vermont	
	Whitingham	Wilmington
Alert	6:25	6:23
EOC activated	5:30	6:24
EOC operational	5:50	6:29
Site Area Emergency/ Public Notification	8:20	8:15
General Emergency/ Public Notification	9:38	9:34
EBS messages	7:20 10:47	10:45
Shelter	9:38	-
Evacuation	-	-
Access control	-	-
State of emergency	-	-
Exercise terminated	11:35	11:32

2 EXERCISE EVALUATIONS

2.1 PLUME EXPOSURE PATHWAY EXERCISE

2.1.1 Massachusetts State Operations

2.1.1.1 Massachusetts EOC

The Massachusetts EOC, located in the MCDA headquarters in Framingham, was well suited for extended radiological emergency response. This facility was equipped with adequate backup power, which is reported to be regularly tested. The space was adequate for emergency response operations; sleeping and eating facilities were available for extended operations. Various status boards displayed significant emergency messages, such as the status of the local EOC activities, ECLs, and PARs. However, displays and maps of evacuation routes, access control, and radiological monitoring points, and population data were not prominently posted. The location or status of relocation and shelter areas were not posted at all, necessitating continuation of a previous inadequacy (#82-6). The displays and maps that were posted were updated in a timely manner, except for meteorological data.

Activation and staffing were initiated immediately following notification by the utility of an Alert declared at YRNPP. The Massachusetts EOC was fully staffed, including representatives of the MCDA, MDPH, State Police, National Guard, and other State emergency response agencies. The MDPH deployed a health physicist to the EOF to serve as liaison between the utility and the Massachusetts EOC. The MCDA maintains an adequate 24-hour alert and activation system in cooperation with the State Police, thereby correcting a previous inadequacy (#82-8). However, the roster presented to provide for 24-hour staffing of the EOC listed as alternates persons who were already participating, and for other positions no backup personnel were listed, necessitating continuation of a previous inadequacy (#83-10).

The MCDA Director conducted a continuous briefing forum throughout the plume exposure pathway exercise. However, the Director made decisions during his briefings without discussions with or the involvement of the available EOC staff resources. Thus, EOC staff members did not participate in the briefings and were not involved in the decision-making process. As a result, EOC staff members were not afforded the opportunity to demonstrate their knowledge of emergency roles and initiate any response activity. Follow-up activities and periodic status reports of PAR implementation at both the State and local EOCS were not requested by the MCDA Director nor were they provided to EOC staff or normally included in the briefings. State and local plans were available for reference. Incoming and outgoing messages were logged in the message center and then duplicated and distributed. Upon the arrival of the Civil Air Patrol (CAP), the administrative staff was relieved of its message duplication and distribution duties.

The State's communications capability was adequate to support emergency operations. The system consists of the Nuclear Alerting System (NAS), a dedicated land line, National Warning System (NAWAS), low- and high-band radio, police radio, Civil Defense (CD) and Radio Amateur Civil Emergency Service (RACES) radio systems. These systems functioned effectively during the exercise. The ability to communicate with the utility, Belchertown Area IV EOC (which in turn communicated with the local EOCs), contiguous states, EOF, FEMA, EBS stations, State Police, and field personnel was demonstrated, thereby correcting a previous inadequacy (#82-9). Hard-copy data and messages were sent and received over two dedicated telefacsimile machines, thereby correcting a previous inadequacy (#82-11). Additional telefacsimile capability was available if needed. Communications were primarily conducted over NAS and commercial telephones during the exercise; however, other systems were demonstrated early in the exercise.

Technical analysis of plant and field data during the plume exposure phase was accomplished at the EOF. Deciding on PAs is the responsibility of the Governor's designated representative, the MCDA Director. A series of PA decisions was made by the MCDA Director, based on recommendations from Massachusetts personnel at the EOF. These decisions were then to be conveyed to the media, the public, and the affected agencies. These activities were partially coordinated with the contiguous states.

Two deficiencies were identified for the Massachusetts EOC and have subsequently been corrected. One had to do with the failure to utilize EOC staff effectively. The second deficiency came about because EOC staff did not coordinate the alert and notification sequence in a timely way necessitating continuation of a previous inadequacy (#86-5). Also, the EOC did not effectively provide coordination with the State of Vermont.

The Massachusetts EOC staff members did not follow the public alerting and notification procedures for simulated activation of tone-alert radios and sirens prior to the simulated release of EBS messages at both the Site Area Emergency and General Emergency declarations. In addition, alert and notification procedures and PA decisions were not coordinated with the State of Vermont EBS broadcast. However, the coordination of EBS broadcast with designated radio stations was demonstrated.

The Commonwealth of Massachusetts provided thermoluminescent dosimeters (TLDs) for the local EOCs, thereby correcting a previous inadequacy (#83-6). The Department of Public Health Coordinator issued the recommendation to administer KI to emergency workers in Florida and Monroe during the exercise.

Deficiencies

1. **Description:** Massachusetts EOC staff members were not involved in the decision-making process; decisions were often made by the MCDA Director during his briefing presentations; staff members were not afforded the opportunity of demonstrating their knowledge of emergency roles. (NUREG-0654, II, A.1.a, A.2.a)

Recommendation: The MCDA Director and the EOC staff should actively participate in the decision-making process at the EOC.

2. **Description:** Massachusetts EOC staff members did not follow the public alerting and notification procedures for simulated activation of tone-alert radios and sirens prior to the simulated release of EBS messages at both the Site Area Emergency and General Emergency declarations. In addition, a lack of coordination with the State of Vermont was evident in EBS message content and siren and tone-alert-radio activation. (NUREG-0654, II, E.6, F.1.b)

   Recommendation: Public alerting and notification procedures should be followed at the Massachusetts EOC, and simulated activation of tone-alert radios and sirens should occur prior to the simulated release of the EBS message. In addition, the Massachusetts EOC should coordinate EBS message content and siren and tone-alert-radio activation with all affected contiguous states.

Areas Requiring Corrective Action

1. **Description:** Massachusetts EOC staff members were not kept informed as to the status (i.e., open or closed) of the relocation and shelter areas. (NUREG-0654, II, J.10.a)

   Recommendation: The status of relocation and shelter areas should be either posted or periodically announced at the Massachusetts EOC.

2. **Description:** The Massachusetts EOC was unable to provide a complete and current roster of available staff for 24-hour coverage of the EOC. (NUREG-0654, II, A.2.a, A.4)

   Recommendation: Additional personnel should be recruited and trained as soon as possible for staffing all necessary positions listed in the plan for State EOC operations. The current roster of backup personnel should be revised.

3. **Description:** The Massachusetts EOC staff members were not provided periodic information on the implementation of PARs and status at the local EOCs. (NUREG-0654, II, A.1.b, A.2.a)

   Recommendation: The Massachusetts EOC staff should be provided periodic status reports of PAR implementation at both the State and local EOCs.

Area Recommended for Improvement

Description: Displays and maps in the Massachusetts EOC were not effectiveiy used and prominently posted.

Recommendation: Displays and maps (i.e., those showing evacuation routes, access control points, radiological monitoring points, and population data by evacuation area) should be prominently posted and used in the EOC, and meteorological data should be updated in a timely manner.

2.1.1.3 Belchertown Area IV EOC

The activation of the Belchertown Area IV EOC and its staff at 6:07 p.m. was demonstrated by use of a current call list. Staffing was completed within 45 minutes of the Alert notification. A roster was presented to demonstrate the capability for 24-hour staffing. Represented at the facility were EOC, MCDA, State Police, Public Works, and the ARC. The EOC had sufficient space, furnishings, and equipment to accommodate extended operations, including backup power. The necessary status boards and maps were displayed and effectively updated.

The Civil Defense Director (CDD) was effectively in charge of the Belchertown Area IV EOC. Staff members were generally competent and knowledgeable about the performance of their duties. Frequent briefings were held by the CDD. A copy of the plan was available in the operations room for reference, as were written procedures and checklists. All messages were logged, reproduced, and promptly distributed to the staff and to communications personnel for transmittal. This EOC acts as liaison between the Massachusetts EOC and the local EOCs; however, only one request for assistance or support was received. This request from the Town of Rowe was promptly acted upon, and it was apparent that the staff could have handled other requests just as capably.

A major responsibility of the Belchertown Area IV EOC is to act as the communications link between the Massachusetts EOC and the local EOCs. The primary communications system used was the CD radio, with amateur radio systems and commercial telephones as backup. All messages were transmitted to local communities; the radio operators used a call list to verify reception of each message by each community. In addition, three staff members in the operations room telephoned each community to verify reception of the messages. This system appeared to ensure that all messages were received. However, many of the local EOCs (e.g., Florida EOC) indicated that the messages were sometimes excessive in length, garbled, incomplete, or delayed, necessitating continuation of a previous inadequacy (#83-1). Nevertheless, the Rowe and Clarksburg EOCs received timely information, thereby correcting previous inadequacies (#83-15, 83-16, and 83-17).

The Belchertown Area IV EOC was not located within the 10-mile plume EPZ. Nevertheless, staff members were knowledgeable about radiological exposure control. In particular, the Radiological Defense (RADEF) Officer gave an excellent briefing on the use of dosimetry.

Deficiency

Description: The Belchertown Area IV EOC had some difficulty early in the exercise with radio transmissions to local EOCs. The messages were sometimes garbled or incomplete, and some important messages were delayed in being transmitted to the Florida EOC. (NUREG-0654, II, E.6, F.1.b)

Recommendation: The Belchertown Area IV EOC should have its communications system repaired, and proper procedures should be

followed to ensure that important messages are transmitted to the affected local EOCs in a timely manner. Also, when further information regarding PAs is requested, Area IV should respond promptly.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.1.1.3 Massachusetts Field Monitoring

Mobilization of field monitoring team members was conducted from the Massachusetts EOC and was not observed. Members of both teams (teams 1 and 2) were not prepositioned, but were called from home or duty stations, thereby correcting a previous inadequacy (#86-2). Team members arrived approximately two and one-half hours after the Alert was declared. Dispatched from the Buckland EOF, the teams left at 9:00 p.m. and arrived at their assigned locations by 9:30 p.m. The relocation of the EOF to Buckland, which is approximately 12 miles from the plant, will allow for processing of samples for contamination, thereby correcting a previous inadequacy (#82-14). When a member of team 1 was unable to participate, the State demonstrated its ability to draw upon the EOF staff to free a technical person to act as a team member, thereby correcting a previous inadequacy (#86-3). The Commonwealth of Massachusetts also demonstrated its ability to draw backup personnel from the State of Connecticut. The field teams demonstrated 24-hour staffing capability through presentation of a roster, thereby correcting a previous inadequacy (#83-12). Additionally, as a function of the New England Radiological Health Compact numerous personnel are available to provide 24-hour staffing capability.

The field teams' monitoring equipment was adequate. The utility maintains two complete sets of all instruments required for field monitoring. Both sets were maintained at the EOF solely for the use of State personnel, thereby correcting a previous inadequacy (#83-13). Technical equipment for each team included a ratemeter with a pancake probe for counting air samples, a ratemeter with a thin end-window (G-M) probe, and an ion chamber for higher radiation level measurements. Iodine sampling equipment included a battery-operated air-sampling pump, silver zeolite cartridges, and particulate filters. All of the monitoring equipment was maintained by the utility, and all of the monitoring instruments had been calibrated within the past year.

Some roads within the EPZ are unpaved and would be difficult to travel in the case of severe weather conditions. A 4-wheel drive vehicle would allow field monitoring teams to traverse these roads. In addition, the maps provided to the field teams were not accurate and did not indicate the predesignated monitoring and sampling points.

Both teams demonstrated monitoring procedures in accordance with the plan. Team members checked out their equipment, following a written checklist, and verified the applicability of their survey instruments. They checked out the operation of their survey meters with a cesium-137 check source. Proper air-sampling procedures were followed, and filters and cartridges were properly handled, identified, and logged. Team 2 simulated transport of plume exposure pathway samples to the Massachusetts laboratory in Jamaica Plain, which would have taken approximately three hours to complete. Team 1 took one air sample. No other physical samples were collected by either team. The field teams were knowledgeable about proper procedures in performing technical operations but were never able to demonstrate their capability. The teams' monitoring procedures had been revised to include beta and gamma readings at waist level and ground readings, thereby correcting a previous inadequacy (#86-4).

Both teams did an acceptable job. They do not require any training in addition to that required to maintain competency, thereby correcting a previous inadequacy (#82-13). Radio communications to and from the field and between monitoring teams was still a problem, with many "dead spots" being encountered. Addition of a repeater on Mount Greylock did not correct the situation; a previous inadequacy (#84-23) therefore remains uncorrected. One solution would be to add crystal(s) to the State radio that include the utility frequencies, which would enable the State field teams to contact the utility to relay information.

Both teams were equipped with dosimetry and were familiar with procedures for decontamination. KI was maintained at the EOF and was not issued to teams prior to deployment. Team members knew the proper procedures for use of KI and would have used it in accordance with instructions from the EOF.

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** Radio transmission continued to be a problem for the Massachusetts field monitoring teams. The addition of a repeater on Mount Greylock had not corrected the situation. (NUREG-0654, II, F)

   Recommendation: Crystal(s) could be added to the State radio that include the utility frequencies. This solution would enable the State field teams to contact the utility to relay information.

2. **Description:** The Massachusetts field teams were not provided with current and accurate maps of the EPZ area and did not indicate the predetermined monitoring points. (NUREG-0654, II, I.8)

   Recommendation: The Massachusetts field teams should be provided with current maps of the EPZ area which should indicaate the predesignated monitoring and sampling points.

Area Recommended for Improvement

Description: The field teams vehicles were in poor condition.

Recommendation: The Massachusetts field teams should be provided with vehicles capable of being operated on unpaved roads and rough terrain.

2.1.1.4 Massachusetts Local EOCs

2.1.1.4.1 Buckland EOC. The Buckland EOC had adequate space; however, a separate communications area or some additional space would enhance its capabilities. Lighting and furnishings were sufficient. There was a kitchen and backup power. A status board was posted and kept up to date on ECLs and other significant events. Other information posted included evacuation routes, access control points, relocation centers, and population data by evacuation areas, thereby correcting a previous inadequacy (#82-20). The noise level at the EOC was high because a class for emergency medical technicians was meeting in the next room.

The Alert notification was received at 6:03 p.m. from Tri-State Mutual Aid Fire radio. The Buckland EOC was activated at 6:10 p.m. by the CDD. Before the exercise began, an underground gas leak had been noticed at a nearby manufacturing plant. Some of the EOC staff were handling this emergency when the EOC was activated. When the General Emergency was declared at approximately 9:30 p.m., virtually the entire staff was present, as the gas leak was essentially under control. A call list was available to activate staff; staff members also have pagers. A roster was presented to demonstrate 24-hour staffing capability. The EOC staff demonstrated that they could adequately handle two emergencies simultaneously.

The Chairman of the Board of Selectmen was the person designated in the plan as responsible for EOC management. The CDD assumed this position initially because the Chairman was attending to other duties. When notification of the General Emergency was received, the Chairman was called to the EOC at which time he assumed full control. A copy of the plan was available for the staff. The Chairman noted that parts of the plan were used last year during a flood and were quite useful. Message logs were kept, and access to the EOC was controlled.

Communication systems, both primary and backup were utilized during the exercise. For the first two hours, the best information came through the RACES operator, whose services proved invaluable. Verification of CD radio messages was often via telephone. Direct communication with the police vehicle was available via the fire frequency radio.

The CD radio worked poorly. Incoming messages were garbled and broken. The radio repairman dispatched from the Buckland EOF to work on the radio could not find any problems. Transmissio eventually became clearer. All of these problems were the result of communication difficulties at the Belchertown Area IV EOC. See Deficiency, pages 34 and 35.

Only eight families live in the plume EPZ. Their evacuation was not ordered; however, the EOC staff decided to evacuate them. A route alerting team was dispatched to notify the affected families. They thought that Charlemont, which is just across the river, had been ordered to evacuate. Actually, Charlemont and Buckland had only been ordered to shelter. This misunderstanding arose because radio transmission was so bad. The eight families all have National Oceanic and Atmospheric Administration (NOAA) tone-alert radios. These had been recently checked and found to be in proper working

order, thereby correcting a previous inadequacy (#83-3). When the 50-mile EPZ was put on dairy alert, the farmers listed in the plan were notified (simulated).

The plume EPZ has only one road, and resources were adequate to handle traffic and access control functions. Town highway equipment and crews were available to clear road impediments, if necessary. There are no special needs persons in the community. A mini-scenario involving an overturned truck on the Route 2 bridge was promptly and capably handled by the Police Chief. He ordered use of an alternate evacuation route through the town of Shelburne Falls, as anticipated.

The Buckland EOC had an adequate supply of direct-reading dosimeters and TLDs, exposure record-keeping forms, and two radiological survey meters. The calibration of the survey meters was up to date. The availability of radiological equipment thereby resolves a previous inadequacy (#83-20). The CDD and all EOC staff have completed a radiological monitoring course. Proper procedures were therefore understood and applied in assigning dosimetry to the route alerting team at the time of its dispatch.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Area Recommended for Improvement

Description: The communications area within the Buckland EOC needs to be enhanced.

Recommendation: Enhance the communications capability with a separate communications room.

2.1.1.4.2 Charlemont EOC. The Charlemont EOC had adequate space and was furnished with sufficient furniture, lighting, and equipment to adequately support its emergency response activities. There was no backup power at the EOC; however, the portable generator on one of the fire trucks could have been used, if necessary. A status board was clearly visible, and ECLs were posted, thereby correcting a previous inadequacy (#82-21). A map of the plume EPZ was posted, which showed evacuation routes and population data. Maps showing relocation centers, access control points, and route alerting information were available, but not posted. All EOC personnel live nearby; therefore, despite the absence of a kitchen, bunks, or showers, the EOC was capable of extended operations.

Activation and staffing of the Charlemont EOC were performed promptly and smoothly. The Alert notification was received initially at 6:09 p.m. by the Charlemont Fire Department via the Tri-State Fire Mutual Aid network. The dispatcher immediately notified the CDD and the Chief of Police. The CDD activated the EOC and declared it operational at 6:15 p.m. The verification call, placed immediately to the Belchertown Area IV EOC, informed them that the Charlemont EOC had been activated. The remainder of the EOC staff was notified of the plant's status and placed on standby. Upon notification of a Site Area Emergency, a written call list was used to call in the remaining EOC staff members. Staffing was completed at 8:55 p.m. The EOC was adequately staffed, thereby correcting a previous inadequacy (#86-7). Around-the-clock staffing capability was demonstrated by a roster, thereby resolving a previous inadequacy (#83-21).

The CDD effectively managed Charlemont EOC operations, as provided for in the plan. Staff members provided support and were involved in the decision-making process, particularly when their functions were involved. The local plan was referenced from time to time. Message logs were accurately maintained. Staff members were orally briefed on all messages. There was no need to distribute copies of radio messages as all messages were read loud and clear and easily heard by the staff. Access to the EOC was not directly controlled; however, the staff explained that anyone unknown to them would be denied entry to the EOC. The staff was dedicated in carrying out its responsibilities in this exercise.

The primary communications system used during the exercise was the CD radio. A radio base station is being installed at the Charlemont EOC to allow communication with emergency workers in the field. Because installation is not yet complete, the station could not be demonstrated during this exercise, necessitating continuation of a previous inadequacy (#86-6). The EOC had installed a radio to monitor EBS messages, but it was not used during the exercise. The EOC had two telephone lines. A RACES operator was present throughout the exercise to provide backup support.

The Belchertown Area IV EOC experienced some interruptions in messages transmitted to the Charlemont EOC. On two occasions, interruptions as long as 15 minutes were experienced in transmitting messages to the Charlemont EOC. See Deficiency, pages 34 and 35.

At 10:10 p.m., instructions were received at the Charlemont EOC to shelter in place. Vehicles with public-address systems were promptly dispatched (simulated) to

Zoar Road to notify residents to shelter in place. The town siren system can also be used by the Fire Department to notify residents. Those who live beyond the reach of the sirens have been issued tone-alert radios. The two public alerting systems complement each other.

Traffic control and access functions were not demonstrated during this exercise. However, when a tractor-trailer was reported overturned at the Buckland/ Shelburne Falls town line, EOC staff discussed the possible need for them to set up roadblocks and reroute traffic. The Police Chief called the Buckland EOC and offered assistance, on the basis of this discussion. The Charlemont EOC staff also concluded that assistance would be requested from the State Police and Belchertown Area IV EOC if local resources were not sufficient to simultaneously cover all access and control functions. The list of persons with special needs and the mobility impaired had been revised recently, thereby correcting a previous inadequacy (#86-8). This list was kept confidential by the CDD.

The Charlemont EOC had an ample supply of all three types of direct-reading dosimeters and TLDs. Survey meters and exposure record-keeping forms were also available, thereby resolving a prior inadequacy (#83-22). Instructions were given by the CDD on proper procedures for charging and reading the dosimeters. Dosimeters were issued to all emergency workers upon notification of a General Emergency. KI was available in sufficient quantities, but was not issued. When not in use, the dosimetry equipment is kept under lock and key. Both the RADEF Officer and the CDD were aware of decontamination procedures.

Deficiencies

None.

Area Requiring Corrective Action

Description: The Charlemont EOC was unable to demonstrate communication with emergency workers in the field. (NUREG-0654, II, F)

Recommendation: The radio base station being installed at the EOC should be completed as soon as possible.

Areas Recommended for Improvement

1. **Description:** Some maps were not posted in the Charlemont EOC.

   Recommendation: All require maps and charts should be posted in the EOC.

2. **Description:** Access to the Charlemont EOC was not directly controlled.

   Recommendation: Access to the EOC should be controlled.

3. **Description:** The Charlemont EOC did not monitor EBS messages.

   Recommendation: The radio in the EOC should be used to monitor EBS messages.

2.1.1.4.3 Clarksburg EOC. The Clarksburg EOC was located in an old school that also housed the town hall and various city offices. The EOC was a spacious facility with adequate furniture and lighting. All EOC staff were located in the same room. Simultaneous radio transmission from the CD radio and amateur radio occasionally created a noisy environment. The CDD advised that in a real emergency the RACES operator would be located in a different room to reduce the noise level. Since the previous exercise, a telephone jack and telephone had been installed in the EOC. Backup power was still not available, which could create problems in case of a power failure during an emergency. A status board was prominently displayed and updated as significant events occurred. Professionally prepared maps were displayed that depicted the EPZ and the sectors and area populations. In addition, local maps depicting evacuation routes and access control points were prominently posted, thereby resolving a previous inadequacy (#82-22).

The Fire Department was advised in a call from the State Police at 6:20 p.m. that an Alert had been declared at YRNPP. The call was verified by placing a call back to the State Police. The EOC staff was then mobilized according to the procedure in the Clarksburg plan. Upon notification by the Fire Chief, the First Selectman ordered the CDD to take charge of the operations room. Staffing was completed by 7:10 p.m. Those present included the CDD, the Police and Fire Department representatives, and a ham radio operator. Twelve volunteer firemen were also available at the Fire Department. A system was in place for notifying the staff at any time through the use of a written call list. Staff members were knowledgeable about the plan and went about their respective duties in a professional manner. A roster was presented to demonstrate the capability for 24-hour operation.

Emergency operations management was handled excellently by the CDD, which is according to the plan. The discussions that were held during the course of the exercise about what should be done if certain PAs were required demonstrated a working knowledge of the plan. The plan also provides written procedures and checklists to follow. Message handling was prompt; however, standardized multicarbon message forms would increase the efficiency of informing EOC staff of the status of activities. All messages were verified and then logged. Access to the EOC operations room was controlled by a police officer stationed at the door.

The Clarksburg EOC communicated with the Belchertown Area IV EOC via the CD radio. Receipt of messages was confirmed via the CD radio and over the telephone. Communication with the other EOCs was via CD radio and RACES. Use of the telephone was demonstrated. Also, hospitals and ambulances could be contacted over the police, fire, and ambulance radios. In addition, the tone-alert radios worked well during the exercise, thereby correcting a previous inadequacy (#83-4). Overall, with the invaluable assistance of the RACES operator, the Clarksburg EOC served as an effective communications center.

Unfortunately, communications with the Belchertown Area IV EOC were often delayed and messages were incomplete. The RACES operator often received an accurate and more complete message before the Belchertown Area IV EOC completed transmission to the local EOCs. Furthermore, many messages contained both military and regular clock times, and MCDA message 7 was out of sequence, which resulted in

confusion in Clarksburg. The CDD often advised the Belchertown Area IV EOC of incomplete messages and requested retransmission. Having to retransmit messages increases the radio traffic, which could be a problem in an emergency. Also, when further information regarding PAs was requested, the Belchertown Area IV EOC did not respond with answers. All of these problems were the result of communication difficulties at the Belchertown Area IV EOC. See Deficiency, pages 34 and 35.

No PAs were undertaken at the Clarksburg EOC. However, a written list of all mobility-impaired individuals was available that detailed their special needs.

Supplies of low-, mid-, and high-range direct-reading dosimeters, TLDs, exposure record-keeping forms, and KI were ample. The dosimeters were issued to all personnel at the proper time, and proper procedures were used, thereby resolving a previous inadequacy (#83-23). However, a previous inadequacy (#82-33) concerning the monitoring of radiation doses to emergency workers was not observed during the exercise and remains unresolved.

At approximately 10:00 p.m., the Fire Chief was advised that a fire truck was contaminated. The Chief instructed four firemen to prepare the vehicle for decontamination. The four firemen secured the truck outside the decontamination bay area. Each fireman checked the operation of his CDV-700 survey meter, checked for background radiation levels, and placed a plastic bag over the survey probe. They then suited up in disposable coveralls, rubber overshoes, and latex gloves; simulated taping their cuffs; and placed a dosimeter outside the coverall. Next, the survey/monitoring team approached the vehicle and instructed the driver to get out of the truck and began surveying the driver for contamination. At that point, the controller advised that there was no contamination on the driver or inside the truck. The firemen then began a systematic survey of the truck's exterior. When the firemen surveyed the left front tire, wheel, and wheel well, the controller advised the firemen that they were reading 135 counts per minute (cp n) for the left front tire and wheel and 110 cpm for the left front wheel well. After the Fire Chief was advised of the survey results, he had the data recorded; however, the information was not recorded in the proper columns and boxes.

Decontamination of the vehicle was simulated. The Fire Chief advised that the decontamination procedures would include backing the vehicle into the decontamination bay area, closing the garage door, and rinsing the vehicle with water. After rinsing, the vehicle would be rechecked for contamination. If contamination were still present, the vehicle would be washed with soap and water and rechecked for contamination. When the vehicle was clean, it would be pulled forward so the wash area could be checked for contamination. Decontamination would follow, if necessary. The wash water would drain into a dry well, and the State would advise if anything should be done with it. The Fire Chief established a clean/contaminated area barrier at the Site Area Emergency declaration in anticipation of potential contamination. The Clarksburg Fire Department successfully demonstrated vehicle decontamination.

Deficiencies

None.

Area Requiring Corrective Action

Description: Emergency backup electrical power was unavailable at the Clarksburg EOC. (NUREG-0654, II, H.3)

Recommendation: Emergency backup electrical power should be obtained, either via a permanently installed generator or via a portable generator that could be mounted on a vehicle (e.g., a fire truck) or kept in reserve elsewhere.

Areas Recommended for Improvement

1. **Description:** Message handling at the Clarksburg EOC was adequate, but efficiency could be improved by use of a standardized form.

   Recommendation: A standardized multicarbon message form should be developed and used. The form would reduce or eliminate confusion over messages and could be used in message distribution.

2. **Description:** The person recording the vehicle monitoring results on a form, used the wrong columns and boxes.

   Recommendation: The person(s) responsible for recording radiation monitoring data should receive additional training on the use of the monitoring/decontamination form(s).

2.1.1.4.4 Colrain EOC. The Colrain EOC was located in a well-equipped firehouse with ample space, a kitchen, sleeping accommodations, and backup power. Maps and status boards were posted and used. The status board was kept up to date on significant events, thereby resolving two previous inadequacies (#82-18 and 82-23). Access control points, dairy farms, and water supplies were all posted on one map.

The Colrain EOC was activated about 5:08 p.m., following notification of an Unusual Event. At 6:18 p.m., the EOC was notified via telephone by the Greenfield EOC of the Alert status. The Colrain EOC confirmed this information with the Belchertown Area IV EOC by 6:28 p.m. The radio message from the Belchertown Area IV EOC, notifying the Colrain EOC of the upgrade in plant status to Alert, had not been received. Key personnel were summoned by the Fire Chief from a call list, while the Assistant Fire Chief set up the EOC. With the exception of the selectmen, who were involved in an election debate and could therefore not arrive before 10:00 p.m., staffing was completed by 6:34 p.m. At this time, all functional positions were manned. Additional EOC staff arrived within 30 minutes. However, the CDD had to leave around 7:00 p.m. to take an examination. Twenty-four-hour staffing was demonstrated both by means of a roster and some double staffing of positions. The superintendent of the school was notified but not called in because the exercise occurred while school was not in session.

The Fire Chief, although not designated in the Colrain plan as the person to be in charge, assumed control and led very effectively. Everyone staffing the EOC was obviously well prepared and drilled. Five copies of the local plan were available and were referred to by the staff. Periodic briefings were held. Message logs were maintained. Access control to the EOC was strict; all nonlocals present were asked for identification, including the FEMA evaluator.

Sufficient communications equipment was available. The RACES operator verified receipt of a message before the same message was received on the CD radio. However, this sequence of events was not a source of confusion. All radio messages from the Belchertown Area IV EOC were confirmed over the radio and then by telephone.

As in the last exercise, the Belchertown Area IV EOC had trouble transmitting to Colrain. In particular, notification of the Alert was never received. After this failure, radio messages were scratchy though audible and discernable for the remainder of the exercise. See Deficiency, pages 34 and 35.

Public alerting was simulated. The Fire Chief simulated activation of the town siren and notification of special needs individuals at 8:20 p.m., following the declaration of Site Area Emergency, and again after the General Emergency was declared at 9:24 p.m. Special needs individuals were notified from a written list that is kept current. Arrangements were made for transport of the mobility impaired. The Colrain EOC clearly showed that available resources were adequate to alert and instruct the public. Vehicles and personnel were sufficient to man all eight traffic control points. The highway department was prepared to keep the evacuation route open in bad weather or to open an alternate route. Although no PAs were called for, staff members were clearly prepared to act had they needed to.

The supply of TLDs and all three ranges of direct-reading dosimeters was ample, thereby correcting a previous inadequacy (#83-24). The direct-reading dosimeters were tested and distributed to all EOC staff. The EOC staff demonstrated proper procedures for charging and reading dosimeters and recording doses. The instructions given with each dosimetry set were followed by the EOC staff. KI was available, and the staff knew the proper procedures for its use. Staff members were knowledgeable about decontamination procedures.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None

Plan Issue Requiring Corrective Action

Description: The person identified in the Colrain EOC plan as Director was not present, nor was an assistant designated to assume charge in his absence. (NUREG-0654, II, A.1.d, A.2.a).

Recommendation: Change the plan to designate an alternate to be in charge.

2.1.1.4.5 Florida EOC. The Florida EOC was located in the Gabriel Abbott School. The three rooms in the administrative section of the building were adequate to support emergency response operations. The school had showers and a kitchen to support extended operations. It did not have backup power, necessitating continuation of a previous inadequacy (#83-25). The status board was prominently displayed and updated periodically as dictated by exercise events, thereby correcting a previous inadequacy (#82-19).

Following notification at 5:15 p.m. of the Unusual Event, the EOC was activated by the Assistant CDD, who happened to be on the premises. The notification was from the Belchertown Area IV EOC; the message was promptly verified. Staff members were mobilized from a written call list. Staffing was completed by 5:30 p.m. with the arrival of the selectmen, the RACES operator, and representatives of the fire, police, and health departments. Staff members were knowledgeable about their duties. Around-the-clock staffing was demonstrated by a current, written roster.

The Assistant CDD was in charge of the Florida EOC until the CDD arrived shortly before the Alert notification at 6:20 p.m. After being briefed, the CDD took effective charge of the EOC for the remainder of the exercise. Briefings were held periodically. A copy of the plan with written checklists for reference was available. A message log was kept.

The CDD radio to the Belchertown Area IV EOC was the primary communications link. Reception was generally good because Florida is at one of the highest spots in the State and has a high antenna. Backup was provided by telephone and amateur radio, thereby correcting a previous inadequacy (#83-26). These communication systems were reliable throughout the exercise. EBS messages were received over the tone-alert radio network.

Problems were encountered in receiving messages from the Belchertown Area IV EOC in a timely manner. See Deficiency, pages 34 and 35.

Florida is a small town at high elevation. Because its citizens inhabit hills and valleys, a tone-alert radio system is used. Each home has an automatic alert and warning capability, thereby correcting a previous inadequacy (#82-31).

Police officers set up road blocks and demonstrated their ability to direct traffic out and to prevent traffic from entering. The order to take shelter was received late, as the message was transmitted out of sequence by the Belchertown Area IV EOC (i.e., message 7 preceded message 6). The shelter-in-place notification of the public was therefore delayed by 30 minutes. Requests by the Florida EOC for the message to be repeated were not honored by the Belchertown Area IV EOC. Florida was recommended to prepare for possible evacuation at 10:15 p.m., after a notice to evacuate was received at 10:00 p.m. from the Belchertown Area IV EOC. At 10:35 p.m., the Florida EOC was recommended to evacuate and was directed to proceed west on Route 2 to the reception center at Williamstown. This activity was promptly and effectively carried out, at least through the evacuation. Information on special needs persons was available, and arrangements were made for their transportation; however, the information was not

available in written form. The EBS message to shelter animals and place them on stored feed was received and disseminated by the Health Officer.

The supply of low-, mid-, and high-range direct-reading dosimeters, TLDs, KI, and exposure record-keeping cards was adequate, thereby correcting a previous inadequacy (#83-27). Both the CDD and the Health Officer exhibited excellent knowledge about dosimetry, decontamination procedures, and use of KI.

Deficiencies

None.

Area Requiring Corrective Action

Description: No backup power was available at the Florida EOC. (NUREG-0654, II, H.3)

Recommendation: Backup power should be obtained. The source should be either a permanently installed unit or a mobile unit that can be quickly hooked up.

Area Recommended for Improvement

Description: Although this was not required to be demonstrated at the site, information on the location and special needs of mobility-impaired persons was not available in written form at the Florida EOC.

Recommendation: Information should be available at the EOC in written form on the needs and location of special needs individuals.

2.1.1.4.6 Hawley EOC. The Hawley EOC, located on the second floor of the firehouse, had sufficient resources for emergency operations. A kitchen, toilet facilities, and emergency power were available to support extended operations. (The EOC was formerly located in the town hall. The new location is at a much higher elevation, which apparently improves radio communications.) All necessary displays were posted. Displays and communications equipment, including telephones, were adequate, thereby correcting previous inadequacies (#82-1 and 82-24).

Activation of the Hawley EOC was initiated by a call from the State Police over the Tri-State Mutual Aid Fire radio, which was verified. Staffing was completed about 10 minutes later. A roster was presented to demonstrate around-the-clock staffing capability. The staff appeared to be adequately trained and knowledgeable. Previous inadequacies (#82-28, 83-28, and 83-29) relating to activation and staffing were resolved.

The CDD, under the authority of the selectmen, effectively managed the staff. He briefed the staff periodically and involved them in the decision-making process. Written procedures were followed, security was maintained, logs were kept, and messages were handled efficiently.

Communications were by means of a CD radio, Tri-State Mutual Aid Fire radio, RACES, and commercial telephone. Capability was demonstrated by contacts with the Belchertown Area IV EOC and field personnel.

Public alerting and notification are not local responsibilities. However, all residents have now reportedly been provided with tone-alert radios, which would alert them to tune to their EBS radio frequency, thereby correcting a previous inadequacy (#82-30). In addition, the Hawley EOC simulated the dispatch of a route alerting team and the telephoning of certain organizations (e.g., ski resort and Buddhist Temple).

The staff demonstrated the ability to implement recommended PAs. A written list of mobility-impaired people and those without transportation was available. A map showing evacuation routes and access and traffic control points was clearly displayed. A local transportation company could have provided buses and other vehicles for evacuation, and individuals have been assigned to coordinate evacuation, access control, and traffic control.

The staff was familiar with the use of dosimetry equipment and KI. The supplies, which were properly stored, were sufficient for all emergency workers. The staff was knowledgeable about the need and procedures for decontamination, thereby correcting a previous inadequacy (#83-30). The instruments available included direct-reading dosimeters (0-200 mR, 0-20 R, and 0-200 R), TLDs, and chargers. Record-keeping cards and instructions were issued with the dosimetry.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.1.1.4.7 Heath EOC. The Heath EOC had adequate space, furniture, lighting, and telephones, but the lack of sleeping quarters, showers, and kitchen facilities would limit its suitability for extended operations. A status board was displayed and periodically updated. The other displays, however, need to be improved. Most displays were not in clear view of the staff and were in no position to be used effectively.

Activation was initiated by a call from the State Police over the Tri-State Fire Mutual Aid network. The Heath EOC was fully staffed about 15 minutes after the message was verified. Around-the-clock staffing capability was demonstrated by double staffing of positions, thereby correcting a previous inadequacy (#83-31). The staff showed adequate training and knowledge. Staffing of the EOC was complete, thereby correcting a previous inadequacy (#86-10).

The Chairman of the Board of Selectmen was in charge, and the CDD, under his authority, managed operations. Although staff members were involved in decision making, briefings were infrequent. Most of the staff worked with written procedures and checklists. Messages were logged; however, the information was not distributed to the EOC staff. Information exchange in the Heath EOC would be improved if the Chairman and the CDD were located closer to the Communications Officer and the checklists provided in the plan were used.

CD radio, RACES, and commercial telephone were the means of communication. Their use was demonstrated by contacts with the Belchertown Area IV EOC, the Greenfield Reception Center, and the route alerting teams. The EBS station was continuously monitored. All communication systems worked well.

No PAs were recommended for the Heath EOC, with the exception of a mini-scenario. The ability to control traffic under normal conditions was adequately demonstrated. However, because of the limited number of roadways leading to Heath, evacuation of the community could pose a problem, especially during inclement weather. Information on special needs persons was available; however, the written information was not complete at the EOC. The mini-scenario called for evacuating the EOC and establishing an alternate EOC. When the message with this recommendation was received at 9:45 p.m., the CDD conferred with the Chairman. A decision was made to send an advance party to the Greenfield Reception Center, and the Chairman then left with a backup EOC staff member. Shortly thereafter, at 10:06 p.m., a message was sent from the reception center to the Heath EOC. It stated that the alternate EOC had been established. The Heath EOC was not actually evacuated, nor did the alternate EOC play any further role.

All required dosimeters and related equipment were available, and the supply on hand matched the inventory records. Instructions were issued along with the dosimeters. An adequate supply of KI was on hand, and knowledge of its use was demonstrated. The staff was knowledgeable about the need and procedures for decontamination. The Radiological Officer appeared to have been adequately trained for monitoring and controlling radiation exposure, thereby correcting a previous inadequacy (#82-34).

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

1. **Description:** Displays at the Heath EOC were either on the floor or between tables and therefore not arranged for effective use.

   Recommendation: Displays should be set up so that they are clearly visible and arranged for efficient use.

2. **Description:** Frequent briefings were not held in the Heath EOC.

   Recommendation: The Chairman and/or the CDD should brief the staff frequently.

3. **Description:** Message handling in the Heath EOC was inefficient.

   Recommendation: A standardized message form should be developed and used. The form would reduce or eliminate confusion over messages and should be used for message distribution.

4. **Description:** Information exchange within the Heath EOC needs improvement.

   Recommendation: The CDD should be moved closer to the Communications Officer, and the checklists in the plan should be used.

5. **Description:** Although this was not required to be demonstrated at the site, written information on special needs persons was not complete at the Heath EOC.

   Recommendation: The written information on special needs persons should contain each person's name, location, telephone number, and special need(s).

6. **Description:** There were no sleeping quarters, showers or kitchen facilities within the Health EOC.

   Recommendation: The Health EOC should provide sleeping facilities, showers and kitchen facilities for extended operations.

2.1.1.4.8 Monroe EOC. The Monroe EOC, which is located in the town hall at Monroe Bridge, had adequate furnishings, plumbing, and telephones. Noise was controlled well. Because the EOC is only 0.7 miles from the plant, an alternate EOC is located in a garage at the top of a nearby mountain. This latter facility is minimal, with RACES as the only means of communication. All necessary maps were displayed, and the clearly visible status board was frequently updated. A backup generator located at the sewage treatment plant was available and could have been brought to the EOC and put into operation within 15 minutes.

Activation of the Monroe EOC was initiated by direct notification from YRNPP. The Chairman of the Board of Selectmen, who is also the CDD, elected to activate the EOC following notification of an Unusual Event. He took this action because of the close proximity of the EOC to the plant and because some of the staff members work out of town. The EOC was fully staffed in a timely manner, thereby correcting a previous inadequacy (#83-33). The capability for 24-hour staffing was demonstrated by presentation of a roster. The alternate EOC was also activated and staffed. The staff appeared to be sufficiently trained.

The CDD was clearly in charge of the Monroe EOC operations, thereby correcting a previous inadequacy (#82-29). His performance was outstanding. Since four of the six principal staff members were involved with route alerting and operation of the alternate EOC, their involvement in decision making was minimal. However, the decisions made were appropriate and timely, and the staff was kept informed. Written procedures and checklists were used, and all messages were logged. There was no formal control of access to the EOC, but there is only one entrance and it is in clear view of the CDD. Monroe has a population of only 150 and no police force. The present method of controlling access was therefore acceptable.

The primary means of communication was the CD radio, with commercial telephone and RACES for backup, thereby correcting previous inadequacies (#83-2 and 83-32). Also, an intercom system had been installed linking the Monroe EOC with the alternate EOC. All systems were demonstrated. Because the only means of communicating between the alternate EOC and the Belchertown Area IV EOC is RACES, some consideration should be given, as previously recommended, to making the CD radio available to the alternate EOC.

Incoming messages from the Belchertown Area IV EOC were frequently broken and garbled on the CD radio. Also, the Belchertown Area IV EOC took too long to transcribe messages, thereby keeping the network tied up. See Deficiency, pages 34 and 35.

Public alerting was promptly accomplished by sounding the sirens, followed by route alerting. Prescripted messages were used, and coordination with siren activation was excellent, thereby correcting a previous inadequacy (#82-32). The Town of Monroe consists of two villages, each having 32 houses. Because the villages are separated, the siren at Monroe Bridge may not always be heard in Monroe. The tone-alert radio at the EOC was demonstrated once and worked well, thereby correcting a previous inadequacy (#83-5). The message was generic and contained no EBS instructions. Procedures were in place for notifying and, if necessary, evacuating the five special needs persons.

Monroe received recommendations for sheltering in place and partial evacuation of the town. Actions were taken promptly and in accordance with the plan. The nearby towns of Readsboro, Vermont, and Florida, Massachusetts, were contacted for assistance with access control. Monroe informed the Williamstown Reception Center and the Belchertown Area IV EOC of the number of evacuees and which vehicles to expect and when to expect them. Arrangements were made for notifying and evacuating the five people having special needs. The ability to evacuate the town by a convoy of private cars led by a Highway Department truck was demonstrated.

Radiation exposure control and monitoring capabilities were demonstrated by the town's RADEF Officer, who is also the plant's designated town worker. The supplies of direct-reading dosimeters (0-200 mR, 0-20 R, 0-200 R), TLDs, chargers, record-keeping cards, and KI were adequate, thereby correcting a previous inadequacy (#83-34). Dosimeters were charged and issued to staff members, together with instructions for their use. Knowledge of the need for decontamination and where to seek it was evident, thereby correcting a previous inadequacy (#82-4).

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

1. **Description:** If the Monroe EOC were to be evacuated, RACES would be the only means of communicating with the alternate EOC.

   Recommendation: CD radio capability, as well as a commercial telephone, should be provided for the alternate EOC.

2. **Description:** There was no formal control of access into the Monroe EOC.

   Recommendation: There should be a formal control of access into the EOC.

2.1.1.4.9 North Adams EOC. The North Adams EOC was located over the fire station. Although telephones, furnishings, and space were adequate, the overall operation could have been more efficient if operations had not been spread over three rooms. Noise was satisfactorily controlled, and backup power was available. All necessary displays were posted, but the status board was not kept up to date after the Site Area Emergency was declared, resulting in information that was sometimes inaccurate.

Activation and staffing procedures were promptly initiated by a call from the Massachusetts State Police through Tri-State Mutual Aid Fire radio. Mobilization procedures were demonstrated by using a call list that appeared to be current. Except for the mayor and the RADEF Officer, the North Adams EOC was fully staffed. The staff seemed to be generally knowledgeable about emergency procedures and adequately trained. A roster was presented to demonstrate around-the-clock staffing capability.

The Commissioner of Public Safety was in charge. Briefings were informal and inaccurate information was given to the staff. The staff was told by the Commissioner that an Alert ECL was in effect when in fact it was a Site Area Emergency. There was no evidence that the staff was involved in decision making. Forms were not used to inform the staff of the status of activities.

The primary means of communication was the CD radio, with commercial telephone and RACES for backup. Communications worked satisfactorily. Information received from the Massachusetts EOC through the Belchertown Area IV EOC was clear and concise, thereby correcting a previous inadequacy (#83-35).

No PAs were recommended for North Adams. Several traffic control points were established (simulated) to support evacuation efforts of nearby towns, thereby correcting a previous inadequacy (#83-36). Resources for keeping evacuation routes open were adequate. A written list of mobility-impaired persons and those having special needs was available.

The supply of direct-reading dosimeters (0-200 mR, 0-20 R, 0-200 R), TLDs, chargers, KI, and record-keeping cards was adequate, thereby correcting a previous inadequacy (#83-37). However, no instructions on the use of dosimeters were issued. Personnel were also aware of decontamination procedures.

The fire station was used as a decontamination facility. Procedures were demonstrated for decontaminating persons, but not vehicles. The monitoring equipment, instrumentation, proceedures, and action levels were properly demonstrated. However, calibration stickers were missing from the monitoring instruments; an individual's thyroid was not checked; and radiation survey data were not recorded. Individual privacy was lacking, and no provisions had been made for separate male and female areas. Overall, the demonstration was adequate, but it appeared that the exercise controller coached the players beforehand on what they were to demonstrate.

The Commissioner of Public Safety briefed a newspaper reporter, gave copies of messages to him, and allowed him to stay in the operations room throughout the exercise.

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** No instructions were given at the North Adams EOC regarding zeroing, charging, and using direct-reading dosimeters; decontamination; use of KI; and radiation exposure record keeping. (NUREG-0654, II, K.3.a, K.3.b, J.10.e, K.5.a, K.5.b)

   Recommendation: All emergency personnel should be given instructions on proper use of dosimeters and procedures for decontamination; use of KI; and maintaining exposure record-keeping forms.

2. **Description:** The status board at the North Adams EOC was not kept current. (NUREG-0654, II, D.3)

   Recommendation: The ECLs should be posted accurately and promptly.

3. **Description:** Person designated in the North Adams plan was not effectively in charge of emergency operations at the EOC. (NUREG-0654, II, A.1.d)

   Recommendation: The alternate(s) designated to be in charge of the EOC should be properly trained.

4. **Description:** Briefings were informal and inaccurate information was given to the North Adams EOC staff members. (NUREG-0654, II, A.1.b, A.2.a)

   Recommendation Periodic briefings should be held in the North Adams EOC and accurate information should be given to the staff.

5. **Description:** There was no evidence that the North Adams EOC staff was involved in decision making. (NUREG-0654, II, A.1.b, A.2.a)

   Recommendation: The North Adams EOC staff members should be involved in the decision-making process.

Areas Recommended for Improvement

1. **Description:** Space allocation at the North Adams EOC was inefficient.

   Recommendation: Consideration should be given to rearranging operations so that they are not spread over three rooms.

2. **Description:** Message handling in the North Adams EOC was inefficient.

   Recommendation: A standardized message form should be developed and used. The form would reduce or eliminate confusion over messages and should be used for message distribution.

3. **Description:** Personnel performing radiation monitoring at the decontamination facility forgot to check an individual's thyroid and to record radiation survey data.

   Recommendation: Personnel performing radiation monitoring should receive additional training in proper radiological monitoring procedures.

4. **Description:** Calibration stickers were missing from the radiation monitoring instruments.

   Recommendation: Calibration stickers should be placed on all radiation monitoring instruments.

5. **Description:** The decontamination facility had no provisions for separate male and female areas.

   Recommendation: The decontamination facility should be provided with separate male and female dressing and showering areas.

2.1.1.4.10 Rowe EOC. The Rowe EOC was located in the fire station, which is a fairly new building. The operations room was large and has adequate furniture, lighting, and equipment. The noise generated by the proximity of the communication systems to the table used by the selectmen, CDD, and Police Chief caused some interference between the two groups. The status boards were posted and kept up to date within reasonable time frames and were used by all staff members. A plume EPZ map board was present, but no data was posted. The RADEF Officer was located across the hall and had adequate space for his activities. He was close to the entrance and exit and therefore controlled the access of emergency workers. Additional displays and maps were more than adequate, thereby correcting a previous inadequacy (#82-26).

The Alert message was received from the Tri-State Mutual Aid Fire radio at 6:07 p.m. by the Deputy Fire Chief at his home. The CDD was then paged, and both reported to the Rowe EOC by 6:15 p.m. Alerting of personnel commenced immediately, and personnel started arriving within five minutes. The EOC was fully activated and staffed by 6:55 p.m. Members were fully aware of their duties and responsibilities and performed effectively. The Chairman of the Board of Selectmen, for training purposes, designated one of the other selectmen to act as chairman for this exercise. Second-shift and first-shift personnel assignments for demonstration of 24-hour staffing of the EOC required some individuals to act for more than one department.

Management of the Rowe EOC was both effective and coordinated. The selectman in charge briefed the staff on incoming messages and coordinated discussions prior to decision making. Each staff member was familiar with and used the checklists in the plan at each escalation in ECL. Each provided the selectman in charge with a report upon completion. Staff discussions generated by department heads well in advance of needs clearly kept the town ahead in the various PAs necessary for the exercise.

Communication equipment in the EOC included the Tri-State Mutual Aid Fire radio, commercial telephones, CD radio, various local department radios, and two radio scanners used to monitor other activities. The RACES operator arrived without a power pack, but the Fire Department was able to provide him with equipment to get on the air. All systems appeared to work very well. Message handling and logging were done well. However, consideration should be given to moving the communication systems to another room in order to lower the noise level. The CDD monitored the YRNPP radiation monitoring teams and received useful weather data and radiological information.

The Rowe EOC played a minor role in the public alerting process, even though the Belchertown Area IV EOC or the Massachusetts EOC was responsible for the EBS messages. The Rowe EOC had a route alerting system, under the Police Chief, in which citizens were simulated to have been notified at their homes.

The Police Chief, with the approval of the Chairman of the Board of Selectmen, established a plan for controlling access from the north and east. Highway Department staff were used to simulate the manning of traffic control points. The problems anticipated to occur in an evacuation were discussed in depth, and various solutions were considered for each problem. Outside help might have been required to effect an evacuation, but that point was never reached. Access control was simulated. Mobility-

impaired persons were well known to the Fire Department, Police Department, and CDD. The Rowe EOC decided to evacuate the four special needs individuals at the Site Area Emergency ECL, rather than wait for State EOC guidance.

A footlocker contained all the necessary radiological equipment in adequate quantities, including TLDs, thereby correcting a previous inadequacy (#83-38). The RADEF Officer operated from a room near the entrance to the Rowe EOC. He demonstrated dosimetry established a monitoring station, and maintained records in a praiseworthy manner. KI was issued to emergency workers upon leaving the EOC.

Deficiencies

None.

Area Requiring Corrective Action

Description: No data was posted on the plume EPZ map in the Rowe EOC. (NUREG-0654, II, H.3)

Recommendation: An EOC staff person should be assigned responsibility for posting data on the plume EPZ map, and updating it when changes occur.

Areas Recommended for Improvement

1. **Description:** Around-the-clock staffing required that Rowe EOC staff fill positions in more than one department.

   Recommendation: In order to maintain 24-hour staffing, the Rowe EOC should consider acquiring and training additional individuals for the various EOC departments.

2. **Description:** A noise problem was created by the communication systems being located in the operations area of the Rowe EOC.

   Recommendation: The communication systems at the Rowe EOC should be moved to another room to reduce the noise level within the operations area.

2.1.1.4.11 Savoy EOC. The Savoy EOC was located in the garage area of the fire station. Fire apparatus was moved outside to accommodate EOC operations. Space and furnishings were adequate, but the one commercial telephone available was insufficient. Backup power was available and most necessary displays were posted, thereby correcting a previous inadequacy (#82-27). However, the plume EPZ map was not co-located with the other maps and status board in the main operations area of the EOC. Showers and other facilities for extended operations were limited.

Activation and staffing were initiated by a call from the Massachusetts State Police through the Tri-State Mutual Aid Fire system. The staff was called up using radio pagers and an up-to-date call list. The EOC was operational within a few minutes and fully staffed shortly thereafter. The staff showed adequate knowledge and training.

The Chairman of the Board of Selectmen was briefly in charge, as called for in the plan. He then designated his authority to the CDD, who periodically briefed the staff. A copy of the plan was available, and written procedures and checklists were used. Message handling was satisfactory.

Communication was conducted by CD radio, with a commercial telephone for backup. The CDD acted as a radio operator and message clerk. However, the CDD effectively managed emergency operations at the EOC. It would enhance operations to further separate the radio and telephone in the EOC. Some difficulty in conducting telephone conversations did occur during the exercise.

Intermittent problems were experienced with the CD radio and messages were not always clear from the Belchertown Area IV EOC. See Deficiency, pages 34 and 35.

A message from the Belchertown Area IV EOC recommended that Savoy residents take shelter for two hours. Consequently, the CDD requested that the Belchertown Area IV EOC put the information for the public in an EBS message. The dispatch of fire trucks with sirens sounding for route alerting was simulated. The broadcast of informational messages was also simulated.

Resources were adequate for keeping evacuation routes clear and for handling traffic control. The staff was aware of the location of mobility-impaired persons and those having special needs, but this information was not written down.

Direct-reading dosimeters (0-200 mR, 0-20 R, and 0-200 R), TLDs, chargers, exposure record-keeping cards, and KI tablets were available and in adequate supply, thereby correcting a previous inadequacy (#83-39). The RADEF Officer inventoried the equipment and zeroed the direct-reading dosimeters, executed exposure record-keeping forms, and issued instructions, thereby correcting a previous inadequacy (#83-40). The Health Officer organized a decontamination team, reviewed procedures with the team, and set up a decontamination station.

Deficiencies

None.

Area Requiring Corrective Action

Description: The Savoy EOC had only one commercial telephone line available for the staff. (NUREG-0654, II, F)

Recommendation: Additional telephone lines should be procured for use by the Savoy EOC staff.

Areas Recommended for Improvement

1. **Description:** Some difficulty was experienced in conducting telephone conversations in the Savoy EOC because the radio was located too close to the telephone.

   Recommendation: The radio and telephone at the Savoy EOC should be farther apart.

2. **Description:** The plume exposure EPZ map was not posted within the main operations area in the Savoy EOC.

   Recommendation: The plume exposure EPZ map should be moved to the main operations area in the EOC.

3. **Description:** Although this was not required to be demonstrated at the site, there was no list of mobility-impaired or special needs individuals at the Savoy EOC.

   Recommendation: A list of mobility-impaired and special needs individuals should be maintained at the Savoy EOC.

2.1.1.5 Massachusetts Reception Centers

2.1.1.5.1 Greenfield Reception Center. The Greenfield Reception Center was located in the cafeteria building of Greenfield Community College. The decontamination area was located in the basement. The center could support long-term congregate care for 2500 persons, which was its stated capacity.

Registration was accomplished by both college and ARC personnel, thereby correcting previous inadequacies (#84-7 and 84-8). The relocation center was entered from the decontamination area. Initial registration was performed by college personnel. If a medical problem existed, the person would then be registered by the ARC. If no problem existed, the evacuee would be sent to the shelter area.

Fire Department personnel were responsible for monitoring and decontamination. In demonstrating their technique for vehicle decontamination, the firemen were clearly not familiar enough with the procedures, necessitating continuation of a previous inadequacy (#84-6). The three instruments available (CDV-700, CDV-715, and CDV-717) were brought by the firemen. Only one instrument was equipped for audio response and low-level surveys. Calibration of the instruments was current. The Bendix dosimeters were charged and ready to operate.

Greenfield Community College was the coordinating facility for the reception center. It had the resources needed to care for families and to keep them together. It could meet health, recreation, sleeping, and food needs for an extended period.

Two staff members arrived from the Heath EOC, which was being evacuated. The manager of the reception center took them to an area set aside for the alternate EOC. The Belchertown Area IV EOC and the Heath EOC were notified.

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** The firemen at the Greenfield Reception Center were not sufficiently trained in decontamination procedures. (NUREG-0654, II, J.12)

   Recommendation: Additional training in decontamination and radiological monitoring procedures should be provided for the firemen.

2. **Description:** Only one survey instrument had audio equipment and low-level radiation survey capability at the Greenfield Reception Center. (NUREG-0654, II, J.12)

Recommendation: Additional instruments with audio equipment and low-level radiation survey capability should be provided at the Greenfield Reception Center for use in radiation monitoring.

Areas Recommended for Improvement

None.

2.1.1.5.2 Williamstown Reception Center. The Williamstown Reception Center was located at Greylock High School and was well equipped to serve as a reception center. This location is more than five miles outside of the 10-mile EPZ, thereby partially correcting a previous inadequacy (#82-10). Space allocation has been improved.

Activation and staffing by the ARC, Williamstown Fire Department, and other EOC personnel were timely, thereby correcting a previous inadequacy (#86-12). New registration forms were used, and the registration process was effectively demonstrated, thereby correcting a previous inadequacy (#83-18). Separate procedures for receiving and sheltering were followed by the staff present in each location. However, evacuees were not kept informed as to the status of emergency activities through the use of an information center (e.g., bulletin board) in accordance with the plan.

Communications were provided by a new CD radio, commercial telephone, and RACES. The communication systems worked well; however, the staff was not familiar with the procedures for operating the CD radio.

Radiological monitoring, decontamination equipment and procedures, and exposure control for emergency workers were demonstrated. The disposable coveralls used by emergency workers were too small for some individuals, and extra-large coveralls were not available for evacuees, if necessary. Some degree of training was evident, but the training appeared to have been rapid and brief, necessitating continuation of a previous inadequacy (#82-10). Floor coverings (e.g., absorbent paper with a plastic backing) to minimize the spread of contamination were not used, and more signs, arrows, and lane-control materials would be advisable.

Three persons arriving at the Williamstown Reception Center were monitored, thereby correcting previous inadequacies (#83-19 and 86-11). They were found not to be contaminated and were sent to the registration area, where they went through the reception and mass-care-registration processes. Food service was available, and the space was adequate for handling the rated capacity of 2600 persons.

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** Floor coverings and additional visual aids are needed to prevent the spread of contamination within the Williamstown Reception Center. (NUREG-0654, II, J.12)

   Recommendation: A four-foot-wide absorbent paper with a plastic backing should be obtained for use as a disposable floor covering between the relocation and monitoring areas. This item should be added to the list of supplies in TAB A, Attachment 2, page 2-A-1, of the plan. In addition, visual aids (e.g., rope on moveable posts,

instructions, and arrows) should be provided for controlling and informing the evacuees.

2. **Description:** The emergency workers performing radiation monitoring of evacuees and the operator of the CD radio at the Williamstown Reception Center were inadequately trained. (NUREG-0654, II, F, J.12)

   Recommendation: Additional training should be provided for the Williamstown Reception Center staff, with emphasis on radiological monitoring procedures and operation of the CD radio.

Areas Recommended for Improvement

1. **Description:** The disposable coveralls available for emergency workers and evacuees at the Williamstown Reception Center were too small for some individuals.

   Recommendation: Extra large disposable coveralls should be obtained for emergency workers and evacuees.

2. **Description:** Evacuees at the Williamstown Reception Center were not kept informed as to the status of emergency activities, which is provided for in the emergency plan.

   Recommendation: The information center (e.g., bulletin board) should give the status of emergency activities, and evacuees should periodically be informed over a public-address system as to what is occurring.

2.1.2 Vermont State Operations

2.1.2.1 Vermont EOC

The Vermont EOC was located on the second floor of a state government complex in Waterbury, Vermont. Activation and staffing of the EOC were handled according to the State plan. YRNPP notified the State Warning Point of the Alert, which had been declared at the plant at 6:08 p.m. The State Warning Point notified the VEM duty officer at 6:15 p.m. Although only one dispatcher was present at the State Warning Point, the individual was able to handle all police traffic and emergency response notifications, thereby correcting a previous inadequacy (#83-44). The duty officer promptly followed proper procedures in notifying the EOC staff, using a prepared call list and commercial telephone and pagers. However, an automatic dialing or group calling system would enhance the notification procedure for EOC staff. The State Warning Point is located in the same building as the Vermont EOC, thereby correcting a previous inadequacy (#83-43).

Vermont EOC staff members arrived promptly and activated the EOC. The following organizations were represented: VEM, State Police, Department of Natural Resources, Department of Agriculture, ARC, Department of Human Services, National Guard, Division of Occupational and Radiological Health, and Department of Transportation. These organizations demonstrated the ability to operate the EOC on an extended basis by presenting a roster, thereby correcting a previous inadequacy (#83-55).

The Vermont EOC was effectively managed by the Public Safety Commissioner. Staff members were knowledgable about their duties and professional in manner. The Commissioner held frequent briefings to keep the staff abreast of events, and members were involved in the decision-making process. The Commissioner should be commended for having held 13 briefings during the exercise. Video graphics were displayed on a screen for the entire EOC staff to view, thereby correcting a previous inadequacy (#83-41). This graphics approach was very helpful in keeping the staff informed.

Access to the EOC was controlled by Vermont State Police. Each person entering the EOC was required to sign in and receive a badge. Upon leaving the EOC, each was required to sign out and turn in the badge. Staff members had written procedures available for their use. They also kept message logs. As the messages were received, they were reproduced and distributed to the staff.

The operations center in the Vermont EOC was small; however, the staff was able to operate efficiently within the confines of the area provided, thereby correcting a previous inadequacy (#82-35). The facility provided the necessary resources to support extended operations (i.e., bunks, showers and kitchen facilities). ECLs were posted, as were necessary maps and charts.

The Wescom SS-4A microwave radio-telephone system was used as the primary linkage between local EOCs and the Vermont EOC. The Wescom system allows conferencing, which can also be used on the landline radio system. The communication systems in the Vermont EOC performed well during the exercise, thereby correcting a previous

inadequacy (#83-45). The operators carried out their assignments in a professional manner. No delays were observed in obtaining or updating information concerning the local EOCs and the Dummerston IFO, thereby correcting previous inadequacies (#86-19 and 86-21). However, the Vermont EOC plan needs revision concerning whether the EOC, rather than the Rockingham alternate EOC, advises local EOCs of ECL changes. The messages were numbered on the master log, which was displayed in the operations room. Although ARES was not used in this exercise, it was activated during the Alert ECL. The utility promptly notified the EOC of all ECL changes through the use of a dedicated communications system, thereby correcting a previous inadequacy (#86-13).

The meteorological conditions prevailing at the time of the exercise resulted in the plume heading to the southwest. The ability of the Vermont EOC to project dosages was not directly demonstrated, partially because of the wind conditions, but primarily because dose projections were made at the Buckland EOF by a radiological health team representing the States of Massachusetts, New Hampshire, and Vermont.

Public notification consisted of prescripted messages which had been developed, but with specific information omitted. These were successfully used, which avoided the necessity for "ad hoc" preparation of EBS messages. Hard copies of completed EBS messages were immediately telefaxed to the Media Center, thereby correcting a previous inadequacy (#86-15). Also, the messages transmitting the PARs described the affected areas using familiar boundaries, jurisdictions, and landmarks.

The various steps involved in preparation of EBS messages (e.g., verification by EBS radio station(s), advising NOAA and local EOCs, activation of tone-alert radios and sirens, and broadcasting the messages) were accomplished in a timely manner since key staff members knew how to execute these procedures and checked one another to verify completion. However, written procedures should be developed to insure accomplishment of these items by persons unfamiliar with the details of the process.

There was no discussion of route alerting for areas where siren coverage was minimal, or non-existent. Additionally, there was no discussion regarding notification of institutions or special population groups in the eventuality of the radioactive plume entering the State of Vermont.

A problem with interstate coordination was evident. On several occasions the Massachusetts EOC advised that it was about to broadcast, or was already broadcasting, EBS messages without having consulted with the Vermont EOC on message content or siren coverage. The Vermont EBS stations from which simulated messages were being broadcast could be heard in the Vermont towns within the EPZ. The Vermont EBS messages were not consistent in content with Massachusetts EBS messages because of the lack of coordination by the Massachusetts EOC with the Vermont EOC. Overall, even though interstate coordination of message content and the activation of sirens and tone-alert radios may be difficult, the ability to provide prompt public notification is very important and should not be demonstrated by simulation only.

The updated plans and implementing instructions for the State Department of Health staff and field monitoring teams were reviewed. New personnel have been hired to operate the laboratory and direct the field monitoring teams.

METPAC computer displays, which allow for independent dose projections, were produced at the Vermont EOC as well as at the Buckland EOF, thereby correcting a previous inadequacy (#86-16). A staff specialist has been newly hired with the expertise necessary to evaluate population exposure to both external and internal sources.

The State of Vermont had an inadequate supply of dosimeters for State emergency workers. TLDs have been obtained and supplied to the State and local emergency workers, thereby correcting previous inadequacies (#84-14 and 86-18).

Criteria have now been established for administering KI to emergency workers, thereby correcting a previous inadequacy (#82-38). The radiation dose limits imposed for radiation emergency workers were revised within the EPA guidelines, thereby correcting a previous inadequacy (#82-37). However, the decision chain in the State plan for authorizing emergency workers to receive radiation doses in excess of the PAGs continues to need further clarification, necessitating continuation of a previous inadequacy (#82-39).

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** Procedures were not evident in the Vermont EOC as to EBS message preparation, verification by EBS radio station(s), activation of tone-alert radios and sirens, and message broadcast and coordination with MCDA. (NUREG-0654, II, A.2.a, E.6)

   Recommendation: Procedures should be developed and followed by Vermont EOC staff members as to EBS message preparation, verification by EBS radio station(s), activation of tone-alert radios and sirens, and message broadcast. All elements of these procedures should be demonstrated at the next exercise in which Vermont participates, including coordination with MCDA.

2. **Description:** Discussions were not held in the Vermont EOC for conducting route alerting where siren coverage may be minimal, or notifying institutions and special population groups. (NUREG-0654, II, E.6, F.1.b)

   Recommendation: Discussions should be conducted by Vermont EOC staff members as to the need for conducting route alerting, as well as notifying institutions and special population groups.

3. **Description:** The State of Vermont had an inadequate supply of dosimeters available for State emergency workers. (NUREG-0654, II, K.3.a)

   Recommendation: The State of Vermont should acquire additional dosimetry for use by State emergency workers.

4. **Description:** The decision chain in the Vermont EOC plan for authorizing emergency workers to receive radiation doses in excess of the PAGs is unclear. (NUREG-0654, II, K.4)

   Recommendation: The section in the Vermont EOC plan on radiation doses in excess of the PAGs should be clarified as to the procedures to be followed by Vermont EOC staff.

Area Recommended for Improvement

Description: The notification procedure for the Vermont EOC staff was time consuming for the one dispatcher at the State Warning Point.

Recommendation: An automatic dialing or group dialing system should be acquired for use by the dispatcher at the State Warning Point.

Plan Issue

Description: The Vermont EOC plan states that Rockingham advises local EOCs of ECL changes. This is now performed by the Vermont EOC.

Recommendation: Change the Vermont State plan to reflect the role of the State EOC in advising local EOCs of ECL changes.

2.1.2.2 Dummerston Incident Field Office

The Director of the Dummerston IFO was notified at his residence at 6:25 p.m. of the emergency by a verified call from the Vermont EOC. Staff notification procedures were demonstrated, using a current call list. The following organizations were represented at the IFO: Director and his staff, State Police, Health Department, Transportation Department, ARC, National Guard, and Windham County Police Department. Staffing was completed by 7:03 p.m., with 24-hour staffing capability demonstrated through double staffing of some positions and presentation of a roster. All staff members displayed excellent training and were knowledgeable about their duties.

The Director was effectively in charge, as provided for in the plan. His briefings were well managed, and the staff participated in decision making. A copy of the plan was available, as were written procedures and checklists. Message logs were kept, and messages were efficiently reproduced and distributed. The Vermont Field Team Coordinator briefed the Director on the status and location of field monitoring teams, thereby correcting a previous inadequacy (#86-20).

The Dummerston IFO had recently been moved into a new facility, which had sufficient space, furniture, lighting, and support equipment. There is no backup power, but a generator is on order. The ECL was posted, and a clearly visible status board was kept current. The following maps were posted: plume EPZ, evacuation routes, relocation centers, access control points, radiological monitoring points, and population data by evacuation area. Access to the IFO was controlled by Windham County police officers. The new facility is excellent, thereby resolving two previous inadequacies (#83-46 and 84-15) relating to internal operations and communications.

The communication systems at the Dummerston IFO were excellent. Dedicated telephone lines provided the primary link to the Vermont EOC, the YRNPP, and local EOCs, with police radio, facsimile machines, and commercial telephones as backups. However, only one radio operator was available and no backup was available. The IFO was well aware of communications between the Vermont EOC and the local EOCs, as the IFO heard local confirmations of all pertinent messages. A previous inadequacy (#82-36) concerning the information being transmitted to local EOCs was thereby resolved. ECL changes were transmitted from the Vermont EOC to the IFO in a timely manner, thereby correcting a previous inadequacy (#86-21). The recent addition of a facsimile system for transmissions between the IFO and the Vermont EOC, YRNPP, and other governmental agencies has enhanced operations considerably. Hard-copy transmission between the IFO and the Media Center was available, but was not used.

In PA matters involving the Dummerston IFO, traffic volume was discussed, traffic control points were promptly ordered, and all roads were blocked (simulated). Resources were adequate, in terms of available personnel and vehicles, to cover all traffic and access control points and functions. The staff was aware of the resources needed to keep roads clear in bad weather or handle situations involving stalled or wrecked vehicles. Although evacuation was not ordered in Vermont, all bus drivers were put on standby in the event they were needed.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

1. **Description:** The Dummerston IFO has an unfilled vacancy for a backup radio operator.

   Recommendation: At least three radio operators should be recruited and trained to fill the radio operator position. An adequate number of replacement radio personnel will thereby be provided.

2. **Description:** Although this was not required to be demonstrated at the site, it was noted that the Dummerston IFO did not have backup electrical power.

   Recommendation: The IFO should obtain backup electrical power. A generator is on order.

2.1.2.3 Vermont Field Monitoring

The Vermont field monitoring teams were mobilized from their workstation in Montpelier. Mobilization procedures were not evaluated during this exercise. Team members were contacted at their homes and dispatched from Montpelier to the Dummerston IFO. Teams 1 and team 2 arrived at the Dummerston IFO by 7:40 p.m. A telephone call-up system with roster was available in the Vermont field team procedures manual.

There were two members per team. One team had a front-wheel-drive station wagon, and the other had a four-wheel-drive vehic' thereby correcting a previous inadequacy (#86-22). Also available was a third ehicle on standby. Before the simulated field trip, team members were briefed on plant and weather conditions and on procedures and responsibilities. The two field monitoring teams were provided with film badges and TLDs, thereby correcting a previous inadequacy (#84-24).

The monitoring equipment was generally adequate. Each vehicle was suitable for handling radiological and sampling equipment. Both teams had radiation monitoring instruments, along with a single-channel analyzer attached to a 2 × 2 sodium iodide (NaI) gamma scintillation detector. Each team also had two MSA Model G air-sampling pumps, thereby correcting a previous inadequacy (#86-23). However, to obtain an adequate air sample (i.e., 20 ft^3, in accorc ance with State procedures), more than four and one-half hours would have been requi ed at a flow rate of 2 L/min. Each vehicle was supplied with an excellent kit that contained soil- and vegetation-sampling equipment. The kits also contained equipment for taking water and milk samples. The teams were supplied with color-coded maps that indicated the sampling locations. According to team members, the monitoring and counting equipment is calibrated yearly; however, most of the instruments did not have calibration stickers. Generally, team members lacked information about instrument calibration and operating characteristics. They did not understand the techniques required to minimize contamination problems in sample counting.

The field teams were not actually dispatched from the Dummerston IFO. The teams did demonstrate their ability to collect air samples by closely following written procedures. However, tweezers were not available to remove and handle the particulate filter to minimize cross-contamination, and the procedures did not cover using the tweezers. No calibration reports were available for the Ludlum instruments so that team members could verify that the window on the single-channel ana'yzer had been properly set for optimal detection of radioiodine at the 10^{-7} µCi/cc level.

The teams are using a 2 × 2 NaI gamma scintillation probe for radioiodine detection; however, a pancake-type G-M probe might enhance their ability to detect radioiodine and might possibly be more versatile during weather so adverse (e.g., extreme cold and damp) that the NaI crystal could crack.

The teams did not take any other physical samples. If they had been required to take several soil samples, for example, procedures and equipment were not available for decontaminating equipment and preventing cross-contamination.

Because the teams were not actually dispatched, communication procedures were simulated. Team members stated that they would maintain radio contact with the Vermont EOC. Each vehicle had only a single-channel radio and a small hand-held radio used primarily to monitor local transmissions.

Dosimetry and decontamination procedures were adequate. Both vehicles contained protective equipment, including heavy-duty boots and gloves. Adequate supplies of KI were available at the Dummerston IFO. Teams had direct-reading dosimeters (0-200 mR, 0-20 R, 0-200 R). Permanent-record dosimeters (e.g., film badges and TLDs) were also available for each team member.

The Vermont field monitoring teams simulated being dispatched to various locations (e.g., Wilmington, Readsboro, and Stamford) for monitoring the plume, should wind directions change. The scenario had the radioactive plume in Massachusetts and moving southwest, away from the State of Vermont. The placement of teams in the plume could not be demonstrated during this exercise, necessitating continuation of a previous inadequacy (#86-14).

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** According to Vermont field monitoring team members, their monitoring and counting equipment is calibrated yearly; however, the instruments did not have proper calibration stickers. (NUREG-0654, II, H.10)

   Recommendation: Vermont field monitoring team members should ensure that equipment brought into the field is properly labeled and that calibration dates have been properly recorded. All monitoring equipment should be clearly labeled as having been calibrated at least annually.

2. **Description:** Vermont field monitoring team members did not understand the techniques required to minimize cross-contamination in sample counting. (NUREG-0654, II, I.8)

   Recommendation: Additional instruction should be provided in preparing and handling samples for counting in order to reduce the possibility of cross-contamination.

3. **Description:** Vermont field monitoring teams demonstrated their ability to take air samples by closely following written procedures; however, tweezers were not available to remove and handle the

particulate filter to minimize cross-contamination. (NUREG-0654, II, I.8)

Recommendation: Although an equipment checklist was available to team members, tweezers were omitted from the list. The checklist should be revised, and all appropriate equipment, including tweezers, should be on the list and in the kits provided to the field teams.

4. **Description:** The air-sampling pumps used by the Vermont field monitoring teams were inadequate. It would have taken more than four and one-half hours at the prescribed flow rate before 20 ft^3 of air would have passed through the particulate filter and silver zeolite cartridge, and radioisotopes, including radioiodines at 10^{-7} µCi/cc, could have been properly detected. (NUREG-0654, II, I.8, I.9)

   Recommendation: The Vermont field monitoring teams should be provided with high-volume air-sampling pumps capable of providing a flow rate of 1.5-2 cfm.

Area Recommended for Improvement

Description: Calibration reports for the Ludlum instruments were not available to verify optimal detection of radioiodine.

Recommendation: Calibration reports for the Ludlum instruments should be available to verify optimal detection of radioiodine.

2.1.2.4 Vermont Local EOCs

2.1.2.4.1 Halifax EOC. The Halifax EOC was located in the meeting room of the Halifax fire station. The facility was adequate in terms of space, lighting, furnishings, and equipment to support emergency operations. Backup power was available from a tested portable generator; other generators were available through individuals. The maps posted showed the plume EPZ, evacuation routes, and relocation centers. In addition, maps showing access control points, radiological monitoring points, and population data were available. However, a clearly visible status board was not used during this exercise. A paper sheet provided information on significant events. The result was less than optimal performance efficiency during exercise activities.

Activation and staffing of the Halifax EOC were adequate for carrying out emergency operations. At 5:23 p.m., the Halifax EOC Emergency Director (ED) was notified of an Unusual Event at the YRNPP on the Southwest Mutual Aid Fire radio. After verifying the call, the ED promptly notified EOC staff members. The ED arrived at the EOC shortly thereafter. An Alert message was received at the EOC at 6:17 p.m., which was immediately acknowledged. The ED again called EOC staff members in a timely manner. Sufficient staffing to carry out emergency operations was completed by 7:52 p.m.; full staffing was completed by 9:13 p.m. Key staff members present included the Chairman and two other members of the Board of Selectmen.

The Halifax EOC was managed effectively by the ED. The staff worked together well, coordinating their activities. Due to excellent communication systems, the ED knew the whereabouts of all key individuals during the exercise. Periodic briefings were held to update the staff on the situation. It was evident that most of the EOC staff cared about their town's safety and emergency operations. Frequent reference was made during the exercise to the 1988 version of the Halifax plan. Most of the staff had a copy of the new version of the plan, thereby correcting an earlier inadequacy (#82-41). All messages were logged; however, messages were not reproduced and distributed to the staff. Reproduction and distribution of messages together with the use of standard message forms would also enhance the efficiency of message handling.

Several communication systems were available to Halifax EOC staff. Official notifications of ECLs were received over Southwest Mutual Aid Fire radio and were verified over two-way radio. The Halifax EOC was also in communication with the Vermont EOC and the local EOCs over a CD microwave network. In addition, five portable two-way radios and at least 10 pagers were available. Commercial telephones served as backup. However, the list of telephone numbers for hospitals, local utilities, etc. should be prepared and posted in the EOC. All communication systems generally worked well throughout the exercise.

Few activities concerning public alerting and instruction, PAs, and recovery and [illegible]ere observed during this exercise; however, the staff discussed n[illegible]tion and [illegible]n activities. Therefore, an earlier inadequacy (#84-17) related to [illegible]very and activities remains unresolved.

Mid- and high-range direct-reading dosimeters and permanent-record dosimeters (i.e., TLDs) were available at the Halifax EOC. The EOC staff demonstrated proper procedures for zeroing and reading the direct-reading dosimeters. Staff members were also familiar with proper use of dosimetry equipment and appropriate record-keeping procedures, thereby correcting a previous inadequacy (#83-50).

Deficiencies

None.

Area Requiring Corrective Action

Description: Telephone numbers for hospitals, local utilities, etc. were not readily available in the Halifax EOC. (NUREG-0654, II, F)

Recommendation: A list should be prepared and posted in the EOC of all important telephone numbers (e.g., hospitals, local utilities, etc.).

Areas Recommended for Improvement

1. **Description:** A clearly visible status board was not used at the Halifax EOC during this exercise. A paper sheet was used to provide information on significant events.

   Recommendation: A clearly visible status board should be used for conveying up-to-date information on significant events.

2. **Description:** A standard message form was not available in the Halifax EOC.

   Recommendation: A standard message form with boxed areas for recording times, ECLs, wind directions, and other related data should be used.

2.1.2.4.2 Readsboro EOC. The Readsboro EOC, located in a large meeting room at the town fire station, was adequate to support emergency operations. It had sufficient space, lighting, furniture, and telephones. The availability of a kitchen and other essential facilities meant that EOC operations could be supported on an extended basis. However, because the communication systems were located in the operations area, noise was not adequately controlled for optimal operations. Displays were minimal. An EPZ map was posted and kept up to date. Maps showing evacuation routes, relocation centers, and population data were available, but not posted for ready reference. Furthermore, maps depicting access control points were not available. Also, a status board was available, but not utilized. In particular, the ECLs were not posted. Therefore, part of an earlier inadequacy (#82-40) related to posting of displays and maps remains unresolved.

Activation and staffing of the Readsboro EOC were weak. At 5:28 p.m., the Deputy Emergency Director (DED) was notified on the Southwest Mutual Aid Fire network of an Unusual Event at the YRNPP. After verifying the call, the DED promptly arrived at the EOC. The ED arrived at the EOC at 6:30 p.m. The DED left at about 6:34 p.m., and the ED about a minute later, to attend to a real-life traffic emergency. The DED returned about 6:40 p.m. and the ED about 7:05 p.m.

The Readsboro EOC staff did not realize that the Alert notification had been transmitted about 6:30 p.m. to the EOC, where the call was received and interpreted by the ED's wife. About 7:21 p.m., the ED learned that an Alert had been declared and that the message had been received by his wife, but not relayed to the EOC staff, necessitating continuation of a previous inadequacy (#86-24). However, once the Alert status was known, staff mobilization was swift. Within minutes eight emergency workers, including three selectmen, arrived at the EOC, thereby correcting a previous inadequacy (#86-25). However, most of the emergency staff then left the EOC to attend a town meeting. The ED, DED, and the communications staff handled most of the EOC operations. Timely messages were received concerning ECLs: at 8:20 p.m., the notification of a Site Area Emergency, and at 9:34 p.m., the notification of a General Emergency.

The management of emergency operations was satisfactory. However, because only a limited number of staff were available in the Readsboro EOC, periodic briefings were not held. The DED was effectively in charge of operations, with the new ED also participating. However, the ED felt that he needed additional training and preparation before assuming EOC leadership. A copy of the Readsboro plan was available at the EOC. Message logs were kept; however, the messages were not reproduced and distributed for efficient handling of information. Use of a standard message form would enhance the efficiency of message handling.

The communication systems at the Readsboro EOC were adequate and generally worked well. The primary communications system was radio, with commercial telephones as backup. The major radio channels available included the CD microwave network, Southwest Mutual Aid Fire network, and Highway Department radio. Also available were the tone-alert radio receiver and an AM radio for EBS messages. Radio contact with the Vermont EOC and the local EOCs was successfully maintained. However, field personnel occasionally had difficulty in contacting the EOC by portable

radio. More powerful portable and mobile radios should be used for more efficient communication.

Public alerting proceeded smoothly at the Readsboro EOC. By 7:50 p.m., two vehicles equipped with a public-address system had been dispatched (simulated) to inform people about the Alert ECL. An advisory message was also broadcast. At 9:34 p.m., the Vermont EOC recommended sheltering in place for Readsboro. After discussion with the EOC staff, the ED coordinated the dispatch of vehicles with public-address systems. These vehicles were dispatched in a timely manner at 9:42 p.m.

Traffic was effectively controlled. Seven traffic control points were promptly activated after learning of the Alert status. Also, the DED indicated that sufficient resources were available to keep evacuation routes clear during bad weather or in the event of traffic impediments.

During this exercise, no individual was evacuated. The EOC staff knew the locations of mobility-impaired persons in the area; however, this information was not available in written form, necessitating continuation of a previous inadequacy (#83-47). Also, the local school could not be contacted, as the exercise was conducted after school hours. Therefore, a previous inadequacy (#86-26) concerning school evacuation procedures remains unresolved.

An adequate supply of direct-reading dosimeters (0-200 mR, 0-20 R, 0-200 R), chargers, and TLDs was available. These dosimeters were properly zeroed and issued to all EOC staff as well as field emergency workers. However, appropriate instructions were not issued with the dosimeters. It was concluded that an earlier inadequacy recommending the presence of a qualified Radiological Health Officer (#82-43) was not a problem for the Readsboro EOC.

Deficiency

Description: The Readsboro EOC was not activated and staffed in a timely manner. The Alert notification was transmitted to the EOC at approximately 6:30 p.m. during staff involvement with a real emergency. The message was received and interpreted by the ED's wife, with the result that the EOC staff was not informed of the Alert ECL until 7:21 p.m.. The EOC was then promptly activated and staffed. (NUREG-0654, II, E.1, F.1.a)

Recommendation: Procedures need to be clarified and followed to ensure that the Alert notification is received by the responsible individuals and that the Readsboro EOC is activated in a timely manner in accordance with the local plan.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

1. **Description:** Although this was not required to be demonstrated at the site, it was noted that the maps depicting access control points were not available at the Readsboro EOC. Also, certain displays, such as a status board and maps, were available, but not used. Finally, ECLs were not posted.

   Recommendation: Displays should be effectively used during emergency operations. The status board should be kept up to date, and the ECLs should be posted. Maps showing access control points should be available. Finally, all displays should be posted for ready reference.

2. **Description:** Although this was not required to be demonstrated at the site, it was noted that the ED, DED, and communications staff handled most of the Readsboro EOC operations; however, the staff members whose participation is called for in the plan were not present throughout the exercise.

   Recommendation: As called for in the plan, the Readsboro EOC should be fully staffed throughout the exercise.

3. **Description:** Although this was not required to be demonstrated at the site, no instructions were given at the Readsboro EOC regarding use of dosimeters and procedures for maintaining radiation exposure record-keeping forms.

   Recommendation: All emergency personnel should be given instructions on proper use of dosimeters and procedures for maintaining exposure record-keeping forms.

4. **Description:** Although this was not required to be demonstrated at the site, the Readsboro EOC did not have information available in written form on the location and special needs of mobility-impaired individuals.

   Recommendation: The Readsboro EOC should prepare a list of mobility-impaired individuals and their special needs.

5. **Description:** Readsboro EOC staff members were not adequately trained for their roles at the EOC.

   Recommendation: The Readsboro EOC staff members should receive additional training.

6. **Description:** The Readsboro EOC field personnel experienced sporadic difficulty in communicating with the Readsboro EOC via portable radios.

   Recommendation: More powerful portable radios should be provided to the Readsboro EOC field personnel for more efficient communication.

7. **Description:** The noise level in the operations area of the Readsboro EOC was not adequately controlled.

   Recommendation: The communication systems should be relocated to an enclosed area away from the operations area.

8. **Description:** A standard message form was not used in the Readsboro EOC, and messages were not distributed.

   Recommendation: A standard message form with boxed areas for recording times, ECLs, wind directions, and other related data should be developed. Messages should be distributed to the staff on these forms.

9. **Description:** Periodic briefings were not held to update the Readsboro EOC staff on the emergency situation.

   Recommendation: Periodic briefings should be held with EOC staff.

2.1.2.4.3 Stamford EOC. The Stamford EOC was located in a new addition to the fire station that is still under construction. The facility was adequate for carrying out emergency operations. Although available, emergency power was not demonstrated during the exercise. Noise was adequately controlled. Appropriate maps and other displays were clearly displayed and kept up to date. Specifically, the principal of the school did a good job updating the plume EPZ map.

The primary staff notification system was the Southwest Mutual Aid Fire network, a dedicated telephone circuit activated by the Rockingham State Police Office. The Fire Chief, school principal, and other town officials can be contacted immediately using this system. At 5:35 p.m., the Fire Dispatcher was notified on the Southwest Mutual Aid Fire network of an Unusual Event at the YRNPP. After verifying the call, the dispatcher began calling the EOC staff members required for activation of the EOC. An up-to-date written call list was used for staff mobilization; however, additional staff members need to be recruited for 24-hour staffing of the Stamford EOC.

The Stamford EOC was notified of the Alert ECL at 6:25 p.m. Following verification of the call, EOC staff members were notified of the Alert ECL. Staffing was completed in a timely manner by 6:40 p.m. The organizations represented at the EOC included the Board of Selectmen, the Fire Department, and the School Department. Fire Department personnel performed many of the EOC functions. They were well trained to carry out their assigned tasks. Approximately eight individuals were continuously involved in EOC operations, thereby correcting an earlier inadequacy (#86-27) related to adequate staffing.

Since the CDD position has not been filled, the Chairman of the Board of Selectmen was effectively in charge of operations at the EOC. She was very knowledgeable and was ably assisted by the Fire Chief. The Chairman held periodic briefings to update the staff on the emergency situation. EOC staff members performed their jobs very efficiently and demonstrated good knowledge of the plan and proper emergency procedures. Copies of the plan, which had been updated in April 1988, were available and were consulted regularly, thereby correcting a previous inadequacy (#86-28). However, an inconsistency in the plan as to procedures for receiving ECL notifications from the Vermont EOC resulted in some confusion in the Stamford EOC. The Rockingham State Police requested verification of an ECL upgrade after the Alert was declared. According to their plan the EOC was supposed to be notified by the Vermont EOC and not the State Police after the Alert level. The EOC was in contact with the Vermont EOC in accordance with their plan.

Message logs were maintained for efficient handling of information. However, messages from the Vermont EOC were not always clear and could have kept the Stamford EOC from performing effectively if it were not for the EOC staff's excellent understanding of the plan and proper emergency procedures. Also, access to the EOC was not effectively controlled. Better control of access to the EOC should be demonstrated in future exercises.

Radio was the primary means of communicating with the Vermont EOC and nearby local EOCs, with telephones available as backup. All communications equipment worked well. However, as discussed above, messages transmitted from the Vermont EOC

were not always clear, which could have kept the EOC from performing effectively. On occasion, the signal broke up and there was considerable static. However, messages transmitted from the other local EOCs using the same system were very clear.

Public alerting proceeded smoothly at the Stamford EOC. The notification from the Vermont EOC to shelter in place was received at 9:35 p.m. The staff met briefly to set up assignments for notifying the public. The procedure was to sound the town siren and activate the tone-alert radios located in each household. Households without electricity had special telephones and a large number of preprogrammed buttons were used to contact each of these households. One individual in town had neither telephone nor electricity; a vehicle was dispatched to notify this person. The following notification actions were taken in a timely manner: (1) activating the EBS and tone-alert radios at 9:35 p.m. and 9:40 p.m., respectively; (2) telephoning individuals without tone-alert radios at 9:40 p.m.; and (3) dispatching a vehicle at 9:42 p.m. to inform an individual without a telephone or electricity. This successful demonstration of public alerting and notification systems corrects an earlier inadequacy (#82-42) related to the tone-alert radios operating properly.

Major PAs were not taken during this exercise. Although traffic control points were not activated, the EOC staff described the procedures for such activation. Also, the staff stated that appropriate resources were available to keep evacuation routes clear even in hazardous situations such as bad weather and road impediments. Also, sufficient local resources, in terms of available personnel and vehicles, were available to perform all traffic and access control functions simultaneously. EOC staff members were also aware of special evacuation problems. For example, the locations of mobility-impaired individuals were known.

Procedures and equipment for exposure control were adequately demonstrated. An adequate supply was available of direct-reading dosimeters (0-200 mR, 0-20 R, 0-200 R), chargers, and TLDs. Appropriate instructions were issued along with the dosimeters. Emergency workers had received training shortly before the exercise. The individuals at the Stamford EOC were knowledgeable about the use of dosimetry. Proper procedures for zeroing and using the dosimeters were demonstrated by a number of the emergency staff. Two earlier inadequacies (#83-48 and 83-49) concerning the recommendations for additional radiological exposure control training are thereby corrected.

Deficiencies

None

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

1. **Description:** Access to the Stamford EOC was not effectively controlled.

   Recommendation: The Stamford EOC should improve its ability to control access to the EOC for future exercises.

2. **Description:** The Stamford EOC does not have a CDD as well as sufficient staff for 24-hour operation of the EOC.

   Recommendation: Additional staff members should be recruited and trained in emergency operations at the Stamford EOC.

3. **Description:** The Stamford EOC plan for receiving ECL notifications was inconsistent with the Vermont EOC and State Police procedures.

   Recommendation: The Stamford plan should be revised in agreement with the Vermont EOC and State Police procedures for ECL notifications.

2.1.2.4.4 Whitingham EOC. The Whitingham EOC was located in the Jacksonville fire station. The facility was excellent, having sufficient space, lighting, furniture, telephones, and other equipment to support emergency operations. Bunks, a kitchen, showers, toilet facilities, food, beverages, and emergency equipment were available to support extended operations. Although available at the site, backup power was not demonstrated during the exercise. A portable generator was available in an emergency vehicle.

Several status boards and maps were prominently displayed, clearly marked, and kept up to date in a timely manner. The map displays showed the plume EPZ, evacuation routes, access control points, and radiological monitoring points. However, a map showing population data by evacuation area was not available in the Whitingham EOC. For this reason, an earlier inadequacy (#83-51) relating to maps in the EOC remains unresolved.

Activation and staffing of the facility were prompt and quite thorough for a local EOC in an area of low population density. At 5:30 p.m., the ED was notified of the Unusual Event at the YRNPP over the Southwest Mutual Aid Fire network. The ED immediately activated the Whitingham EOC. EOC staff members were contacted by telephone, using a written call list. The staff arrived promptly, with the exception of the RADEF Officer, the Health Officer, and the Human Services Officer. The duties of the RADEF Officer were assumed by the DED; the Health Officer and Human Services Officer arrived at 7:50 p.m. and 8:30 p.m., respectively. The following functions and groups were represented at the EOC: the Board of Selectmen, CD, police, fire, health, transportation, RADEF, communications, and supply.

The ability to make decisions and coordinate emergency response activities was clearly demonstrated. The ED managed the emergency operations at the EOC very effectively, with excellent cooperation from the staff. Staff members were keenly interested in the exercise activities and kept up to date at all times. A copy of the most recent plan, dated 1988, was available for ready reference. Message and sign-in logs were maintained.

Several communications systems were available. All incoming emergency messages were received by radio from the Rockingham State Police Office. The separate radio system used to communicate with other local EOCs was part of the Southwest Mutual Aid Fire network. Two commercial telephone lines were available as backup. The Communications Officer did an excellent job of receiving and distributing messages. Messages were occasionally either garbled or unclear as a result of static; however, these messages were immediately clarified. The problem appeared to be associated with the Vermont EOC radio system. Messages received from the other local EOCs were clear.

Public alerting and PAs were the responsibility of the Rockingham State Police Office; therefore, they were not part of the scenario for the Whitingham EOC. The EOC staff was nonetheless well prepared, with the necessary procedures for such an event being spelled out in the plan. Also, the staff stated that appropriate resources were available to keep evacuation routes clear, even in hazardous situations such as bad weather and road impediments. Sufficient local resources were also available, in terms

of available personnel and vehicles, to perform all traffic and access control functions simultaneously. EOC staff members were also aware of special evacuation problems. For example, they knew the locations of mobility-impaired individuals.

The RADEF Officer demonstrated the use of the available dosimetry equipment. She did not fully understand radiological exposure control procedures, stating that she and other members of the staff had requested additional training in radiological exposure control from the State of Vermont. Observations were made with regard to certain problems identified in earlier exercises. The Whitingham EOC had an adequate supply of TLDs, thereby correcting an earlier inadequacy (#83-52) related to the availability of permanent-record equipment. Another inadequacy (#83-53) related to the availability of a RADEF Officer and the training of the staff was partially corrected. Although a RADEF Officer is now available, the EOC staff still needs additional training in use of dosimetry equipment, record keeping, maximum dose allowed without authorization, decontamination procedures, and use of KI. Moreover, another inadequacy (#82-44) related to the responsibilities for decontamination at the EOC remains unresolved. Staff members felt that these responsibilities need clarification and that they have not received adequate training.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

1. **Description:** A map showing population data by evacuation area was not available in the Whitingham EOC.

   Recommendation: A map showing appropriate population data by evacuation area should be available at the Whitingham EOC.

2. **Description:** The RADEF Officer and other staff at the Whitingham EOC did not fully understand radiological exposure control procedures.

   Recommendation: The RADEF Officer and other members of the Whitingham EOC staff should receive additional training in radiological exposure control.

3. **Description:** The Whitingham EOC experienced some difficulty in receiving radio messages from the Vermont EOC.

   Recommendation: The poor-quality radio transmission from the Vermont EOC to the Whitingham EOC should be corrected.

4. **Description:** The responsibilities for decontamination at the Whitingham EOC need further clarification.

   Recommendation: The responsibilities for decontamination at the Whitingham EOC should be clarified and the staff should receive additional training in decontamination procedures.

2.1.2.4.5 Wilmington EOC. The Wilmington EOC was located in the town police station. The EOC had sufficient space, lighting, furniture, and telephones to support emergency operations. Backup power was available at the site, but was not demonstrated during the exercise. A status board was clearly visible and kept up to date on significant events in a timely manner. Several maps were also prominently displayed and used effectively. These maps showed the plume EPZ, evacuation routes, relocation centers, access control points, radiological monitoring points, and population data by evacuation area.

Activation of the EOC was demonstrated. The ED was notified of an Unusual Event at the YRNPP on the Southwest Mutual Aid Fire network. He called the appropriate EOC staff members and notified them of the Unusual Event. At 6:23 p.m., the message concerning the Alert ECL was received from the Rockingham State Police Office. Upon this notification, the ED, who is also the Wilmington Police Chief, activated the EOC. He called, among others, the Fire Chief, the RADEF Officer, the Health Officer, the Highway and Transportation Officer, and members of the Board of Selectmen. However, the ED and the Fire Chief were the only individuals present in the EOC. The ED stated that the remaining EOC staff members were on standby and that they would be included in the decision-making process. Those on standby were briefed by the ED on several occasions via telephone. The operation should have full staff participation at a centralized location.

The ED managed emergency operations at the Wilmington EOC very effectively. The EOC staff was split between the EOC and the fire station and could have operated more effectively at one location. Periodic briefings were held via telephone to update staff members on the situation. A copy of the plan was available for ready reference. Message handling was efficient. All messages were logged. Access to the EOC was controlled. Efficient use of the status board and maps also contributed to the efficient operation of the EOC.

Communications during the exercise were excellent. The Southwest Mutual Aid Fire network worked exceptionally well as the primary notification system until the Vermont EOC was fully functional. At that time, the dedicated Vermont EOC telephone system became the primary communications link. Commercial telephones were available as backup.

Wilmington was not affected by the plume during this exercise, therefore, evacuation was not required. However, the EOC staff discussed evacuation and sheltering in the event a PA was recommended. The EOC staff did express concern about traffic flow in the center of town and suggested that assistance from the County or the State Police may be required to coordinate traffic during an emergency.

The Wilmington EOC was adequately supplied with dosimetry equipment. There were 13 dosimetry kits, each consisting of mid-range (0-20 R) and high-range (0-200 R) direct-reading dosimeters, TLDs, instruction sheet, and exposure record-keeping cards. Also available were two survey meters and a supply of KI. The EOC recently recruited a replacement RADEF Officer. He attended the State Emergency Management RADEF course and is planning to attend a RADEF course at Emmitsburg, Maryland.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

1. **Description:** The ED and Fire Chief were the only persons present in the Wilmington EOC. The ED stated that the remaining EOC staff members were available on a standby basis.

   Recommendations: As called for in the plan, the Wilmington EOC should be fully staffed throughout the exercise.

2. **Description:** The EOC staff was split between the fire station and the police station and they communicated by telephone and messenger.

   Recommendation: The Wilmington EOC staff should be centrally located in a facility that can adequately house the entire staff.

2.1.3 Utility and State Coordination

2.1.3.1 Emergency Operations Facility

The EOF was located in a new facility in the New England Power Company building in Buckland, Massachusetts, thereby correcting a previous inadequacy (#82-7). State and utility personnel had adequate space in which to work, and EOF staff members communicated easily with each other.

Vermont and Massachusetts personnel arrived in a timely manner. The Massachusetts Radiological Health Director contacted his counterpart at the Vermont EOC and offered to send telefacsimile updates until such time as Vermont personnel were able to arrive. Personnel from both States were knowledgeable and highly proficient in carrying out their duties.

The METPAC computer system was used by both States at the EOF to perform dose projections, thereby correcting previous inadequacies (#83-9 and 83-54). However, because of a flaw in the scenario, the METPAC dose projections and the results of the YRNPP field monitoring team measurements did not agree. The YRNPP staff recommended PAs based on the field team results, which indicated higher radiation levels. The Massachusetts EOC staff, on the basis of its own analysis, modified the YRNPP recommendations for evacuation of North Adams, Charlemont, Rowe, and Savoy, recommending sheltering in Rowe, Savoy, and Charlemont. The utility and the Massachusetts EOC concurred on the recommendation to evacuate Monroe and Florida.

Although the EOF staff was well qualified and trained, some inefficiencies were noted in the use of field teams to get enough meaningful data for analyses of the overall situation, necessitating continuation of a previous inadequacy (#83-11). The activities of the State and utility field monitoring teams should be coordinated better. To get more data, the teams should be rotated in and out of the plume, so each team can get one or two sets of samples before pulling back to an area with low background radiation for conducting analyses. While one team is analyzing samples, another team could be taking samples in the plume. Even though three utility and two Massachusetts field monitoring teams were available, only two air samples were taken for radioiodine analysis.

Given the difficulties of obtaining air and particulate samples of a plume moving down a valley, the State dose assessors kept well abreast of the situation. They knew the extent and location of the plume at all times.

The Massachusetts Radiological Health Director recommended that emergency workers in Monroe, Florida, and Savoy take KI. The Massachusetts field monitoring teams were also instructed to take KI, on the basis of iodine levels indicated in an air sample obtained by a YRNPP field monitoring team.

When Massachusetts was faced with the unexpected shortage of one field monitoring team member, the utility loaned a staff member to serve as the radio operator for handling communications with the Massachusetts field monitoring teams. The regular radio operator was then free to serve as the missing field monitoring team

member. In addition, Connecticut's Radiological Health Program simulated the loan of an individual to replace the unavailable Massachusetts member at the EOF.

The communication systems at the EOF for both utility and State personnel were adequate and worked well, thereby correcting a previous inadequacy (#84-22). However, the radio link with the Massachusetts field monitoring teams worked poorly. The teams frequently experienced radio "dead spots" because of the local topography. The State of Massachusetts should discover how YRNPP personnel are able to remain in constant communication with their field monitoring teams and, if feasible, acquire a similar system. In addition, the State representatives at the EOF were not provided with the current list of telephone numbers for variously located telefacsimile units. As a result, considerable time was spent in organizing telefacsimile transmissions and making up a new list of pertinent telephone numbers.

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** The Massachusetts staff at the EOF did not use the field monitoring teams effectively in order to gather enough meaningful data for analyses of the overall situation. (NUREG-0654, II, I.11)

   Recommendation: The efforts of the Massachusetts and YRNPP field monitoring teams should be coordinated. In particular, the teams should be rotated in and out of the radioactive plume.

2. **Description:** The Massachusetts staff at the EOF experienced many radio "dead spots" as it attempted to stay in contact with its field monitoring teams. (NUREG-0654, II, F)

   Recommendation: Because YRNPP personnel at the EOF were able to keep in constant communication with their field monitoring teams, Massachusetts should explore this system with the utility and acquire a similar system, if feasible.

Area Recommended for Improvement

Description: State representatives at the EOF were not provided with a current list of telephone numbers for the variously located telefacsimile units.

Recommendation: State representatives at the EOF should be provided with a current list of telephone numbers for all telefacsimile units.

2.1.3.2 Media Center

Activation and staffing of the Media Center at the Oxbow Motel in Charlemont, Massachusetts, were accomplished in a timely and realistic manner. The first utility PIO arrived shortly before notification of the Alert ECL. Within one and one-half hours, the Media Center was fully functional with a full complement of utility spokespersons and support staff. All communications and support equipment were set up in an impressively short time. The equipment included all telephone lines, telefacsimile machines, radios, copying machines, media-monitoring equipment, briefing displays, and media kits. The Massachusetts PIOs arrived in good time, considering the distances traveled from the point of notification. All organizations indicated that a system of notification and activation was in place to respond at any time of day with both principal and backup staff to sustain a 24-hour operation. The well-trained support staff responded promptly and performed their tasks very efficiently.

Media Center facilities were generally very good. There was adequate space for the PIOs to work and for the media to be briefed, with adjacent areas being available for small meetings and interviews. An adjoining parking lot permitted a clear view for the satellite communication trucks of television stations for transmitting and receiving. The equipment available to the PIOs was markedly improved, including typewriters and copiers. While typewriters were not provided for the media, this did not present a concern, given the common use today of personal portable computers by reporters. Electric power and outlets were needed for these items and the 100-ampere lighting for the television cameras. In addition, backup power was not available at the Media Center. Finally, the three telephone lines for the reporters were inadequate in view of the probable demands of the reporters.

The communication facilities at the Media Center were greatly improved by the establishment of a new telephone system. This system enhanced communications among the Media Center, the EOF, and the several State EOCs. Telephone lines were provided for the utility, the State PIOs, and the Federal agency representatives. A dedicated telephone system was used to connect the PIOs with the EOF. The three facsimile machines enhanced transmission of hard-copy messages and news releases. The backup communications capability consisted of radios for the YRNPP personnel and the State PIOs.

The informational functions performed at the Media Center were generally very good. Eight full-scale briefings and one technical briefing were held during this five and one-half hour exercise. The briefings were timely and informative, with the PIOs explaining technical information in a clear and understandable manner. The many charts, maps, and displays were effectively used, and media kits were available with information on radiation, the YRNPP, and local emergency plan provisions. However, the emergency status board was never used to brief the media during the exercise, necessitating continuation of a previous inadequacy (#84-28). Hard-copy news releases were issued by the YRNPP and the State of Massachusetts; none were distributed by the State of Vermont, which preferred to make announcements. Although radios and a television set were available for monitoring, one AM radio did not work and the other radios and the television set were not actively monitored, necessitating continuation of previous inadequacies (#83-14 and 83-56).

Virtually no time was taken in advance of each media briefing for the PIOs to confer and prepare their presentations. The result was often extemporaneous and poorly organized presentations, with little forethought having been given to probable news media questions. If fewer briefings had been held, more time would have been available to prepare for them.

EBS messages were distributed in hard-copy form and announced by the Massachusetts PIO. However, the State of Vermont did not distribute EBS messages in hard-copy form in the Media Center, although the messages were available in the PIO working area, necessitating continuation of a previous inadequacy (#86-31). The first Vermont news release erroneously identified the cause of the Alert ECL as "leaking of main coolant." This factual error was not discovered and therefore never corrected. The media kits could be improved by including clearer graphics of the plant and biographical data on the speakers. The EBS instructions appeared to be clear, accurate, timely, and appropriate to the situation.

A limited rumor-control operation was maintained in the Media Center. The switchboard operator received six simulated telephone inquiries, thereby correcting a previous inadequacy (#82-12). Five of the calls were referred to appropriate toll-free State information lines. One call was inadvertently referred to the utility PIO, who then referred the caller to the toll-free number. Future exercises should include more rumor-control activities.

The Media Center also corrected certain additional inadequacies from previous exercise activities. The inadequacies corrected included information not being available to spokespersons (#86-17); typewriters not being available to State and utility PIOs, (#84-27); and insufficient hard-copy news releases by Massachusetts representatives were available for the press (#86-30). One previous inadequacy (#86-1) concerning information on school evacuation remains unresolved because the exercise took place in the evening. The necessary information, however, is in public instruction brochures.

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** Backup emergency electrical power was unavailable at the Media Center. (NUREG-0654, II, G.3.a)

   Recommendation: Backup emergency electrical power should be provided at the Media Center.

2. **Description:** The Media Center did not have sufficient electrical power outlets to provide for the electrical requirements of news media equipment (i.e., computers, typewriters, television camera lighting). (NUREG-0654, II, G.3.a)

Recommendation: A contingency agreement should be negotiated with the local utility to provide for the electrical power requirements of the news media.

3. **Description:** Only three telephone lines were available in the Media Center for reporters, which is unrealistic in view of the probable heavy demand by reporters. (NUREG-0654, II, G.3.a)

   Recommendation: A contingency agreement should be arranged with the local telephone company to provide additional telephones in the news media work area.

4. **Description:** Although radios and a television set were available in the Media Center for monitoring the news, one AM radio did not work and the other radios and the television set were not actively monitored. (NUREG-0654, II, G.4.b)

   Recommendation: Media Center procedures should be revised to improve the effectiveness of monitoring personnel. The required training should encompass the following: checking equipment; replacing equipment, if needed; establishing monitoring positions and noting responsibilities; deciding upon tours of duty; and, providing for monitoring reports for each news medium monitored.

5. **Description:** The Media Center staff spent virtually no time conferring in advance of each news media briefing. The result was often extemporaneous and poorly organized presentations. (NUREG-0654, II, G.4.b)

   Recommendation: Media Center procedures should be revised to provide for staff conferences before the news briefings in order to decide what will be presented and to anticipate possible news media questions.

6. **Discussion:** At Media Center briefings, the status board was not used as a public information tool to assist the reporters. The status board would have given the news media a point of reference as to current events. (NUREG-0654, II, G.4.b)

   Recommendation: Media Center procedures should be revised to require use of a status board. The responsibility for keeping it current and making it available to the news media at all times should be appropriately assigned.

7. **Description:** The first State of Vermont news release at the Media Center erroneously identified the declaration of an Alert ECL as resulting from "leaking of main coolant." (NUREG-0654, II, G.4.b)

Recommendation: All news releases covering the technical aspects of the incident should be reviewed by utility and State technical personnel prior to being released.

8. **Description:** The State of Vermont issued news releases and EBS messages; however, they were never distributed in hard-copy form in the Media Center. (NUREG-0654, II, G.4.b)

   Recommendation: The State of Vermont representatives in the Media Center should distribute in hard-copy form all issued news releases and EBS messages.

Area Recommended for Improvement

Description: Although personally owned portable computers are much in use by reporters today, it would enhance operations if a few manual or electric typewriters were available at the Media Center for their use.

Recommendation: A few manual or electric typewriters should be available for use by news media personnel.

2.2 INGESTION EXPOSURE PATHWAY EXERCISE

2.2.1 Massachusetts State Operations

2.2.1.1 Massachusetts EOC

Assessment of the ingestion exposure pathway data, much of which was received by telefacsimile machine from the analytical laboratories, was timely, professional, and well coordinated. Inputs from the State Departments of Food and Agriculture, Fisheries and Wildlife, and Environmental Quality Engineering provided effective interface in the decision-making process. The needs of the agricultural community and the general population were adequately met. The briefings were thorough and concise, demonstrating effective teamwork. The initial deployment of a long term sampling and monitoring program for water and agricultural product indicated assurance that the public's health and safety would be protected.

Emergency response personnel involved in the ingestion exposure pathway exercise not only demonstrated effective teamwork, but coordination and competence as well. Available data were processed and calculated using conservative approaches and recommendations were communicated to the designated decision makers. Decisions were effective and were communicated to the public via EBS.

Interactions of the Massachusetts EOC with the Departments of Food and Agriculture, Fisheries and Wildlife, and Environmental Quality Engineering were effective and the long-term problems regarding recovery procedures and monitoring activities were considered and discussed. Issues concerning farmers, milk, maple syrup, game, other foods, water, and animal feed were appropriately addressed. The Massachusetts EOC staff members effectively demonstrated their ability to consider the nature of the radioactive ingestion contaminants and their consequences on the short and long term public health effects after reentry, thereby correcting a previous inadequacy (#82-15).

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.2.1.2 Belchertown Area IV EOC

The Belchertown Area IV EOC did not participate in ingestion exposure pathway activities since the local EOCs were not participating. Its participation terminated at the end of the plume exposure pathway portion of the exercise. Massachusetts directs all ingestion pathway activities from the State EOC.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.2.1.3 Massachusetts Field Sampling

Mobilization was demonstrated during the plume exposure pathway exercise held on April 26, 1988. Team members stayed overnight in the area and knew when and where to meet for team deployment during the ingestion exposure pathway exercise. Dispatched from the Buckland EOF, the teams left at 10:00 a.m. and arrived at their assigned locations by 10:30 a.m.

The teams' monitoring equipment was adequate. The utility maintains two complete sets of all instruments and equipment required for field monitoring and sampling. The vehicles provided to the teams were not suitable for all expected terrains and weather conditions. Air-sampling equipment was available at the Buckland EOF; however, because air samples were not indicated, certain equipment was not taken into the field. Team 1 had sufficient equipment to collect all necessary samples. Team 2 was missing certain equipment, such as protective booties and gloves, which were available in the utility instrument kit.

Transport of collected samples was simulated. Procedures for sampling, proper labeling, and physically transferring the samples to the laboratory at Jamaica Plain were discussed in detail by the team leaders. Both teams were familiar with proper procedures for sample collection. Team members knew where to take the samples and whom to give the samples to.

Both teams demonstrated good health physics techniques as far as sample collection and adequate measures to prevent the spread of contamination (i.e., double bagging of samples). Team 1 showed good judgment in deciding where to collect vegetation samples (i.e., along the probable path of contaminated water rather than from more convenient areas at higher elevation).

Communications were only slightly better than those during the plume exposure pathway exercise. Some "dead spots" were still experienced in communications to and from the EOF and with the other field teams.

Necessary equipment was available and proper procedures were followed by both teams with respect to radiation exposure control. However, team 2 was missing both personal protective equipment and direct-reading dosimeters because the locker of equipment provided by the utility was not picked up at the EOF. The teams discussed additional and alternate control measures that may be included in future revisions of their procedures.

The scenario provided adequate opportunities for the MDPH to demonstrate ingestion exposure pathway field sampling capabilities. The team leaders effectively discussed with team members sampling procedures, sampling locations, the type of samples to be taken, and the reasons for taking these samples. The comment was made that, in an actual event, sampling instructions would come from the Massachusetts EOC, rather than from the Buckland EOF, as was true for this field exercise.

Ingestion exposure pathway samples were taken, including a milk sample. It was suggested that the "history" of each milk sample be noted on the data sheets (e.g.,

whether the cow was on pasture grass or whether the milk sample was obtained from a tank containing a mixture of milk obtained before or after a release incident).

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** One Massachusetts field sampling team was missing certain equipment, such as direct-reading dosimeters and certain protective clothing. The necessary equipment was available in the utility instrument kit, but the entire kit had been left at the Buckland EOF. (NUREG-0654, II, H.11, K.3.b)

   Recommendation: A checklist of the equipment required to implement the plan should be used to ensure that the required equipment is taken into the field. All members of the field sampling teams should have proper dosimetry, including a permanent-record dosimeter.

2. **Description:** The Massachusetts field sampling teams experienced difficulty in communicating with each other and the Buckland EOF. (NUREG-0654, II, F)

   Recommendation: The State of Massachusetts should consider adding additional channels to the radios used by its field teams. The utility's frequency should be included for possible relay of information.

Areas Recommended for Improvement

1. **Description:** The vehicles used by the Massachusetts field sampling teams were not suitable for all expected terrains and weather conditions.

   Recommendation: The Massachusetts field sampling teams should be provided with vehicles that can be used under all expected terrains and weather conditions.

2. **Description:** The Massachusetts field sampling teams did not note the history of each milk sample on the data sheets.

   Recommendation: The field teams should note the history of each milk sample, including type of feed and time the sample was taken, on the data sheet attached to the sample.

2.2.1.4 Massachusetts Laboratories

2.2.1.4.1 Jamaica Plain Laboratory. The State of Massachusetts Radiological Laboratory at Jamaica Plain had a fully trained staff and a laboratory equipped with the following instrumentation: multichannel analyzer, TLD reader, G-M counter, alpha and beta counters, liquid scintillation spectrometer, and GeLi semiconductor detector. However, no additional or substitute equipment was available for instruments being serviced or those becoming inoperable. Maintenance and calibration procedures were suitable for accurate results. Secondary standards were used for calibration measurements.

Members of the laboratory staff had been effectively trained in electronics and measurement techniques; however, written procedures were not available in the laboratory. The laboratory had limited capacity and personnel for only one shift. The number of samples that could have been processed was limited; however, the plan calls for use of backup laboratories (i.e., Yankee Atomic Radiological Laboratory and Winchester Engineering Analytical Center). These backup laboratories provide the necessary capabilities, thereby correcting a previous inadequacy (#84-25).

Four samples were delivered to the laboratory for analysis: one each of soil, grass, maple sap, and water. A thin-end-window probe was used to scan the sample before removing it from the vehicle. Smears were not obtained from the sample packages to test for loose contamination before they were removed from the vehicle. The vehicle driver was monitored for radioactivity. The samples were taken to the laboratory via the main entrance to the "office complex." This route could have presented a contamination problem if negative smears had not been obtained. Contamination control was unacceptable throughout the sample-handling process and should be properly addressed. Additionally, the error analysis for the sample results should be reviewed.

The entire building complex was actually without telephone service during the demonstration. Consequently, the director of the laboratory had to improvise an alternate method for transmitting the sample count data (i.e., controller input data) to the Massachusetts EOC. A "test" message was sent via telefacsimile machine to the laboratory's office in Boston, from which the data would be telefaxed to the Massachusetts EOC. The phone system was eventually repaired and contact with the Massachusetts EOC was reestablished, both by telephone and telefacsimile systems.

All controller input data, including milk sample data, were sent via telefacsimile machine to the Massachusetts EOC by 12:48 p.m. Once the system was repaired, the "overflow" milk sample data were sent via telephone from Yankee Atomic Radiological Laboratory to the laboratory at Jamaica Plain at 12:56 p.m. The data were then telefaxed from Jamaica Plain to the Massachusetts EOC at 12:59 p.m.

Approval had been received for a purchase order for a "private-line" telephone that would be independent of the building's switchboard. This precaution should preclude future outages for both the telephone and telefacsimile systems.

The staff at the Jamaica Plain laboratory adequately demonstrated its ability to

identify and quantitatively measure radioisotopes. It also demonstrated appropriate procedures for preparing and measuring field samples. Further work is needed in estimating the uncertainty factors in laboratory measurements. In addition, the Jamaica Plain laboratory cannot analyze for strontium and would have to contract such work to a backup facility.

Deficiencies

None.

Areas Requiring Corrective Action

1. **Description:** The samples to be analyzed at the laboratory at Jamaica Plain were transported via the main entrance to the "office complex." Such a route would have resulted in contamination if negative smears had not been obtained as a result of the sample-handling process. Contamination control was therefore not acceptable. (NUREG-0654, II, I.8)

   Recommendation: The staff at the Jamaica Plain laboratory should receive additional training in proper procedures and techniques for processing environmental samples for radioactive measurement in order to minimize contamination of working areas and cross-contamination of the samples.

2. **Description:** The staff at the Jamaica Plain laboratory was unable to estimate the uncertainty factors in its measurements. (NUREG-0654, II, I.8)

   Recommendation: The laboratory's instruments should be routinely inspected and operationally checked, periodically calibrated, and repaired as needed to ensure reliable performance and meaningful measurements. Laboratory staff should receive additional training in estimating the uncertainty factors in its measurements.

3. **Description:** Written operating procedures were not available in the Massachusetts State laboratory at Jamaica Plain, even though the staff had been effectively trained. (NUREG-0654, II, I.8)

   Recommendation: Standard operating procedures should be developed and made available for reference by laboratory staff.

Areas Recommended for Improvement

1. **Description:** The laboratory had no additional or substitute instruments to replace those being serviced or becoming inoperable.

   Recommendation: Arrangements should be made with vendors to supply instruments to replace those being serviced or becoming inoperable.

2. **Description:** The laboratory at Jamaica Plain is limited in that 24-hour staffing cannot be maintained.

   Recommendation: Additional staff should be recruited and trained so that laboratory operations can be maintained around the clock.

3. **Description:** The laboratory at Jamaica Plain was without telephone service during the early portion of the exercise because of a malfunction in the building's switchboard.

   Recommendation: The requested and approved "private-line" telephone should be installed as soon as possible.

4. **Description:** The laboratory at Jamaica Plain cannot analyze for strontium.

   Recommendation: The laboratory at Jamaica Plain should consider developing the ability to analyze for strontium.

2.2.1.4.2 Westboro Laboratory. The Yankee Atomic Radiological Laboratory at Westboro had a fully trained staff and laboratory equipped with the following instrumentation: multichannel analyzers, TLD reader, G-M counter, alpha and beta counters, liquid scintillation spectrometer, and GeLi semiconductor detectors. Backup modules and extra counting units were available to replace those being serviced or becoming inoperable. National Bureau of Standards primary standards were used for calibration purposes, and secondary and working standards were also used. These procedures were ideally suited to ensure accurate readings and measurements. Members of the laboratory staff were generally knowledgeable and well trained in radiological methods and techniques. Around-the-clock staffing capability was demonstrated by presentation of a roster.

Proper screening procedures, including a chain of custody, were evident in the demonstration of receiving "overflow" milk samples. The samples were routed through a sample preparation and counting process. A short count was made to demonstrate the necessary increase in count time to meet the lower limit of detection requirements. The spectral analysis data, including the spectrum, were electronically stored. The sample was then to be placed in a long-term storage area for possible retrieval. A milk sample was processed extremely efficiently; the processing did not tax the ability of the laboratory. The laboratory demonstrated its ability to identify and quantitatively measure radioisotopes in exemplary fashion. It also demonstrated proper procedures for preparing and measuring field samples. Members of the laboratory staff were well trained and supported by a highly qualified director. Sample information and data output were accurately logged, documented, and stored for later retrieval.

During future exercises, more samples should be processed to better simulate the overflow situation. The ability to set priorities for samples in the queue would thereby be demonstrated. Both milk and vegetation samples should be included to demonstrate sample preparation and contamination control.

Telephone and telefax communications between the laboratory, the Massachusetts State laboratory, and the utility were adequate.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.2.2 Vermont State Operations

2.2.2.1 Vermont EOC

Although radioactive plume deposition affected Massachusetts towns only, the Vermont EOC staff recognized that contaminated milk and other food products might be transported into the State. Department of Health and Agriculture personnel watched milk and meat processing plants closely to detect such contamination. Because the plume might have moved north, farmers located close to the State line were advised to keep cows on stored feed for a few more days as a precautionary measure. The staff indicated that, if plume deposition had occurred in Vermont, milk supplies would have been embargoed or converted into products that could be stored for several months.

The updated plans and implementing instructions for the staff and field monitoring teams of the Department of Health and Agriculture were reviewed. New personnel had been hired to operate the laboratory and direct the field monitoring teams. The Vermont State laboratory procedures were observed and those inadequacies noted in the Vermont Yankee Nuclear Power Plant exercise assessment report, Section 2.2.1.2, should be addressed. Agreements have been written to provide strontium-90 analysis at the Food and Drug laboratory at Winchester, Massachusetts.

The Radiological Health Director and his Operations Assistant were quite familiar with procedures for population dose assessment, recommendations for PAs, and preventive measures for reducing public ingestion exposure. Staffing at the Vermont EOC included provision for 24-hour operation. In addition, a staff specialist was available with the necessary expertise to evaluate exposure of the population to both external and internal sources.

Adequate procedures for dose assessment and prediction as to ingestion pathway contributions from 15 sources have been listed and assigned to State agency teams, especially Agriculture. An information brochure entitled *Agriculture and Nuclear Power in Vermont* is being distributed to farm interests through the Extension Service. This brochure is being received with great interest and should greatly reduce inquiries after an accident.

Sample EBS messages were prepared by the Agriculture Deputy Director for use (simulated) at the Vermont EOC later in the exercise. Guidelines for reentry were discussed by the Vermont EOC staff, and adequate procedures were explained, thereby correcting a previous inadequacy (#83-42).

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.2.3 New Hampshire State Operations

2.2.3.1 New Hampshire EOC

The State of New Hampshire participated in the exercise to some extent at the New Hampshire EOC. The Division of Public Health and the Office of Emergency Management participated.

The controller brought all participants up to date on the situation at the YRNPP as of 11:30 a.m. on April 27, 1988. The discussions centered on the plume exposure pathway exercise and the radiation levels reported by the Massachusetts EOC. Decisions were made to take water, milk, air, and soil samples to determine if the radioactive cloud had passed over New Hampshire.

At 12:00 p.m., the exercise was jumped ahead by two days, and additional meteorological and radiation data were injected into play by the controller. Excellent discussions were held on methods for taking samples, placing dairy cows on stored food and water, and transmitting EBS messages to the general public. The additional meetings held to discuss issuance of EBS messages to the public involved (simulated) the Governor, the Office of Emergency Management, and the Director of Public Health. The State of New Hampshire has the necessary equipment for field monitoring, taking samples, and transporting them to the State laboratory for analysis.

The Division of Public Health uses the EPA PAGs in making decisions on both preventive and emergency action levels (EALs) of milk and food products in the ingestion zone.

During the exercise, no radiation was detected in New Hampshire; therefore, the only actions taken were to assure the public that no PAs were necessary and to advise that milk should continue to be sampled until individuals were sure that there was no contamination.

Coordination between the States of New Hampshire and Vermont, and the Commonwealth of Massachusetts was demonstrated in the decision-making process.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.2.4 New York State Operations

2.2.4.1 New York EOC

The New York State EOC was an extensive facility with sufficient space, furniture, lighting, and telephones for emergency operations. It was capable of 24-hour operation. An ingestion pathway EPZ map was posted.

All agencies that expected to be involved in ingestion exposure pathway activities sent personnel to the exercise. New York EOC staff members were aware of their responsibilities and were able, either personally or through the use of agency resources (e.g., the state health laboratory), to carry out their responsibilities.

The Governor's designee was effectively in charge of the New York EOC. An extensive briefing was held to update staff on events and on the responsibilities and capabilities of the various agencies. An extended discussion took place on potential problems and how the State would respond. EOC staff members were aware of the problems and demonstrated that they knew what to do and that they had the resources available to carry out their responsibilities (e.g., using a logical and practical procedure to monitor the ingestion exposure pathway and notifying all dairy farms). A copy of the plan was available and used during the exercise.

The New York EOC had extensive communication systems. Relevant radiological data were received from the Massachusetts EOC via telephone. The State also had available two mobile communications center vehicles that could have been used to direct monitoring teams or to provide complete communications should there have been a power failure or interruption. Each vehicle had 15 telephone lines, several cellular telephones, and a multifrequency radio, and carried 10 local radios for close-in communication.

The dose projection team calculated doses using the TRACES computer model. The team backed these dosages up with hand calculations and then plotted the projections. The PAs taken were based on these dose assessments and other relevant factors. The dose projections would usually be augmented by available field data. Sufficient equipment was available for collecting and transporting samples of soil, vegetation, milk, and water. Equipment for field sampling teams included survey meters, including a microR/hr survey meter, for giving a preliminary reading and indicating if protective clothing (e.g., disposable rubber booties) should be worn. The State laboratory is extensive and is recognized by EPA as fully capable of testing for radioactive isotopes. The laboratory is well equipped; its staff is trained in procedures for receiving and analyzing samples and reporting the results; and it can be operated around the clock.

Up-to-date information was available on the location of dairy farms, food processing plants, and water-supply intake points. Detailed maps showing crop information were available. Cattle were placed on stored feed upon notification of the release. This precaution is standard operating procedure. There is also a trained body of workers, primarily from the Department of Agriculture and Markets, to implement PAs. No other PAs were required.

A public information officer was present throughout the exercise. Plans were developed to brief the media at the New York EOC, if necessary.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.2.5 Utility and State Coordination

2.2.5.1 Emergency Operations Facility

The Buckland EOF was operational and sufficiently staffed for the ingestion exposure pathway exercise. The Massachusetts Field Team Coordinator demonstrated his ability to properly analyze and prioritize the activities of field sampling teams.

Both the Vermont and Massachusetts representatives at the EOF gave an acceptable verbal roster of available personnel for maintaining 24-hour staffing. The States and YRNPP representatives demonstrated excellent cooperation in exchanging technical information and making PA decisions.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Areas Recommended for Improvement

None.

2.2.5.2 Media Center

The Media Center did not participate in ingestion exposure pathway activities. Its exercise functions terminated at the end of the plume exposure pathway portion of the exercise. However, emergency public instructions were drafted in the form of a news release at each State EOC.

Deficiencies

None.

Areas Requiring Corrective Action

None.

Area Recommended for Improvement

Description: The Media Center did not participate in the ingestion exposure pathway portion of the exercise, even though news releases, EBS messages, and rumor-control activities were involved.

Recommendation: The Media Center should participate in ingestion exposure pathway activities.

3 SCHEDULE FOR CORRECTION OF DEFICIENCIES AND AREAS REQUIRING CORRECTION ACTION

Section 2 of this report lists deficiencies and areas requiring corrective action, along with the recommendations noted by the Federal evaluators. These evaluations are based on the applicable planning standards and evaluation criteria set forth in Section II of NUREG-0654/FEMA-REP-1, Rev. 1, entitled *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* (Nov. 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 and areas requiring corrective action noted in the exercise have been corrected and that such corrections have been incorporated into the State and local plans, as appropriate.

FEMA requests that the State and local jurisdictions submit the measures that they have taken or that they intend to take to correct deficiencies and areas requiring correction action. 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.

The definitions of exercise inadequacies are as follows:

Deficiencies are demonstrated and observed inadequacies that would cause a finding that off-site emergency preparedness was not adequate to provide reasonable assurance that appropriate protective measures can be taken to protect the health and safety of the public living in the vicinity of a nuclear power facility in the event of a radiological emergency. Because of the potential impact of deficiencies on emergency preparedness, they are required to be promptly corrected through appropriate remedial actions, including remedial exercises, drills, or other actions.

Areas Requiring Corrective Actions are demonstrated and observed inadequacies of State and local government performance; and although their correction is required during the next scheduled biennial exercise, they are not considered, by themselves, to adversely impact public health and safety.

Table 2 summarizes the deficiencies and areas requiring corrective action identified in this exercise, but not the areas recommended for improvement. Table 3 gives the current status of deficiencies and areas requiring corrective action identified in the exercises of March 25, 1982, April 6, 1983, August 22, 1984, June 11, 1986, and April 26-27, 1988. Table 4 lists the status of each of the 36 FEMA core objectives for each State and local jurisdiction by exercise year.

4 REMEDIAL EXERCISE ASSESSMENT

On August 24, 1988, a Remedial Exercise was held to demonstrate the correction of the four deficiencies identified during the April 26-27, 1988 Yankee Rowe Exercise. This report contains a description of activities undertaken to correct the four deficiencies identified in the Summary Deficiency Report of July 19, 1988.

A three and a half hour drill was held on August 24 involving the Massachusetts State EOC, Vermont EOC, Area IV MCDA Office and the local community of Charlemont, MA. The remedial exercise demonstrated the capability of the State EOC and the Belchertown Area IV EOC to alert and notify the public; and to provide informational or instructional messages to the local communities within the Yankee Rowe EPZ over the Emergency Broadcast System (EBS) within 15-minutes. Coordination with the State of Vermont in EBS message content and siren and tone-alert radio activation was fully demonstrated. The director held periodic briefings and involved his staff in the decision-making process during the remedial exercise as set forth in the Massachusetts State Plan. The deficiency at Readsboro, VT has been corrected with the issue of State pagers which will be activated by the Vermont State Police directly from the State or local Warning Points, and will be the official "24-hour points of contact."

This Remedial Exercise has corrected the four deficiencies identified during the April 26-27, 1988 exercise.

MASSACHUSETTS EOC

Deficiency #1

Description: Massachusetts EOC staff members were not involved in the decision-making process; decisions were often made by the MCDA Director during his briefing presentations; staff members were not afforded the opportunity of demonstrating their knowledge of emergency roles. (NUREG-0654, II, A.1.a, A.2.a)

Recommendation: The Massachusetts MCDA Director and the EOC staff should actively participate in the decision-making process at the EOC.

Corrective Action: The MCDA Director maintained constant contact with the operations group and technical support staff, including representatives from the Massachusetts Department of Public Health. Key staff were consulted and their recommendations considered prior to the Director's decision and authorization of actions to be taken. This deficiency has been corrected.

Deficiency #2

Description: Massachusetts EOC staff members did not follow the public alerting and notification procedures for simulated activation of tone-alert radios and sirens prior to the simulated release of EBS messages at both the site area emergency and general emergency declarations. In addition, a lack of coordination with the State of Vermont was evident in EBS message content and siren and tone-alert-radio activation. (NUREG-0654, II, E.6, F.1.b)

Recommendation: Public alerting and notification procedures should be followed at the Massachusetts EOC, and simulated activation of tone-alert radios and sirens should occur prior to the simulated release of the EBS message. In addition, the Massachusetts EOC should coordinate EBS message content and siren and tone-alert-radio activation with all affected contiguous states.

Corrective Action: Conferencing between MCDA and Vermont Directors; determination of EBS broadcast time; notification of EBS message content; EPZ siren notification; activation of the EBS broadcast; and activation of NWS-NOAA weather receivers were capably demonstrated by the MCDA staff and the Vermont EOC. This deficiency has been corrected.

BELCHERTOWN — AREA IV EOC

Deficiency #3

Description: The Belchertown Area IV EOC had some difficulty early in the exercise with radio transmissions to local EOCs. The messages were sometimes garbled or incomplete and some important messages were delayed in being transmitted to the Florida EOC. (NUREG-0654, II, E.6, F.1.b)

Recommendation: The Belchertown Area IV EOC should have its communications system repaired and proper procedures should be followed to ensure that important messages are transmitted to the affected local EOCs in a timely manner. Also, when further information regarding PAs is requested, Area IV should respond promptly.

Corrective Action: For the purpose of this drill the Charlemont EOC was activated to test the message traffic between Area IV and the local EOCs. The communication system at Area IV functioned properly during the drill. Messages to local EOCs were transmitted in a timely fashion and clearly understood. This deficiency has been corrected. The radio operator's procedures

and methodology constitute an Area Requiring Corrective Action. However, it was observed by the evaluator that the radio operator's procedures could have been corrected by prompt action on the part of the Area IV Director. This did not occur. Training in radio procedures and methodology should be standardized and ongoing.

READSBORO, VT EOC

Deficiency #4

Description: The Readsboro EOC was not activated and staffed in a timely manner. The Alert notification was transmitted to the EOC at approximately 6:30 p.m. during notification of a real emergency. The message was received and interpreted by the CDD's wife with the result that the EOC staff was not informed of the Alert ECL until 7:21 p.m. The EOC was then promptly activated and staffed. (NUREG-0654, II, E.1, F.1.a)

Recommendation: Procedures need to be clarified and followed to ensure that notification is received by the responsible individuals and that the Readsboro EOC is activated in a timely manner in accordance with the local plan.

Corrective Action: All towns within the ten mile EPZ of Yankee Rowe have been issued State pagers, and the assigned local "pager carriers" trained in the procedures to be followed upon receipt of a page. The pagers will be activated by the Vermont State Police directly from the State or local warning points. Misunderstood telephone conversations, contact with untrained personnel and other notification problems will be eliminated by this system. This deficiency has been corrected.

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Deficiencies:					
Massachusetts EOC					
1. **Description:** Massachusetts EOC staff members were not involved in the decision-making process; decisions were often made by the MCDA Director during his briefing presentations; staff members were not afforded the opportunity of demonstrating their knowledge of emergency roles.	A.1.a, A.2.a				
Recommendation: The Massachusetts EOC staff should actively participate in the decision-making process at the EOC.					
2. **Description:** Massachusetts EOC staff members did not follow the public alerting and notification procedures for simulated activation of tone-alert radios and sirens prior to the simulated release of EBS messages at both the site area emergency and general emergency declarations. In addition, a lack of coordination with the State of Vermont was in EBS message content and siren and tone-alert-radio activation.	E.6, F.1.b				
Recommendation: Public alerting and notification procedures should be followed at the Massachusetts EOC, and simulated activation of tone-alert radios and sirens should occur prior to the simulated release of the EBS message. In addition, the Massachusetts EOC should coordinate EBS message content and siren and tone-alert-radio activation with all affected contiguous states.					

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Deficiencies: (Cont'd)					
Belchertown Area IV EOC					
Description: The Belchertown Area IV EOC had some difficulty early in the exercise with radio transmissions to local EOCs. The messages were sometimes garbled or incomplete and some important messages were delayed in being transmitted to the Florida EOC.	E.6, F.1.b				
Recommendation: The Belchertown Area IV EOC should have its communications system repaired and proper procedures should be followed to ensure that important messages are transmitted to the affected local EOCs in a timely manner. Also, when further information regarding PAs is requested, Area IV should respond promptly.					
Readsboro EOC					
Description: The Readsboro EOC was not activated and staffed in a timely manner. The Alert notification was transmitted to the EOC at approximately 6:30 p.m. during staff involvement with a real emergency. The message was received and interpreted by the ED's wife, with the result that the EOC staff was not informed of the Alert ECL until 7:21 p.m. The EOC was then promptly activated and staffed.	E.1, F.1.a				
Recommendation: Procedures need to be clarified and followed to ensure that the Alert notification is received by the responsible individuals and that the Readsboro EOC is activated in a timely manner in accordance with the local plan.					

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Areas Requiring Corrective Action:					
Massachusetts EOC					
1. **Description:** Massachusetts EOC staff members were not kept informed as to the status (i.e., open or closed) of the relocation and shelter areas. **Recommendation:** The status of relocation and shelter areas should be either posted or periodically announced at the Massachusetts EOC.	J.10.a				
2. **Description:** The Massachusetts EOC staff members were not provided periodic information on the implementation of PARs and status at the local EOCs. **Recommendation:** The Massachusetts EOC staff should be provided periodic status report of PAR implementation at both the State and local EOCs.	A.1.b, A.2.a				
3. **Description:** The Massachusetts EOC was unable to provide a complete and current roster of available staff for 24-hour coverage of the EOC. **Recommendation:** Additional personnel should be recruited and trained as soon as possible for staffing all necessary positions listed in the plan for State EOC operations. The current roster of backup personnel should be revised.	A.2.a, A.4				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Belchertown Area IV EOC					
Description: The radio operator's performance during the remedial exercise indicated a lack of familiarity with recognized radio procedures and methodology.	F				
Recommendation: All radio operators should be provided with standardized and ongoing training in recognized radio procedures and methodology.					
Massachusetts Field Monitoring					
1. **Description:** Radio transmission continued to be a problem for the Massachusetts field monitoring teams. The addition of a repeater on Mount Greylock had not corrected the situation.	F				
Recommendation: Crystal(s) could be added to the State radio that include the utility frequencies. This solution would enable the State field teams to contact the utility to relay information.					
2. **Description:** The Massachusetts field teams were not provided with current and accurate maps of the EPZ area and did not indicate the predetermined monitoring points.	I.8				
Recommendation: The Massachusetts field teams should be provided with current maps of the EPZ area which should indicate the predesignated monitoring and sampling points.					
Massachusetts - EOF					
1. **Description:** The Massachusetts staff at the EOF did not use the field monitoring teams effectively in order to gather enough meaningful data for analyses of	I.11				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Massachusetts - EOF (Cont'd)					
Recommendation: The efforts of the Massachusetts and YRNPP field monitoring teams should be coordinated. In particular, the teams should be rotated in and out of the radioactive plume.					
2. **Description:** The Massachusetts staff at the EOF experienced many radio "dead spots" as it attempted to stay in contact with its field monitoring teams.	F				
Recommendation: Because YRNPP personnel at the EOF were able to keep in constant communication with their field monitoring teams, Massachusetts should explore this system with the utility and acquire a similar system, if feasible.					
Massachusetts Field Sampling					
1. **Description:** One Massachusetts field sampling team was missing certain equipment, such as direct-reading dosimeters and certain protective clothing. The necessary equipment was available in the utility instrument kit, but the entire kit had been left at the Buckland EOF.	H.11, K.3.b				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Massachusetts Field Sampling (Cont'd)					
Recommendation: A checklist of the equipment required to implement the plan should be used to ensure that the required equipment is taken into the field. All members of the field sampling teams should have proper dosimetry, including a permanent-record dosimeter.					
2. **Description:** The Massachusetts field sampling teams experienced difficulty in communicating with each other and the Buckland EOF.	F				
Recommendation: The State of Massachusetts should consider adding additional channels to the radios used by its field teams. The utility's frequency should be included for possible relay of information.					
Massachusetts State Laboratory					
1. **Description:** The samples to be analyzed at the laboratory at Jamaica Plain were transported via the main entrance to the "office complex." Such a route would have resulted in contamination if negative smears had not been obtained as a result of the sample-handling process. Contamination control was therefore not acceptable.	I.8				
Recommendation: The staff at the Jamaica Plain laboratory should receive additional training in proper procedures and techniques for processing environmental samples for radioactive measurement in order to minimize contamination of working areas and cross-contamination of the samples.					

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Massachusetts State Laboratory (Cont'd)					
2. **Description:** The staff at the Jamaica Plain laboratory was unable to estimate the uncertainty factors in its measurements. **Recommendation:** The laboratory's instruments should be routinely inspected and operationally checked, periodically calibrated, and repaired as needed to ensure reliable performance and meaningful measurements. Laboratory staff should receive additional training in estimating the uncertainty factors in its measurements.	I.8				
3. **Description:** Written operating procedures were not available in the Massachusetts State laboratory at Jamaica Plain, even though the staff had been effectively trained. **Recommendation:** Standard operating procedures should be developed and made available for reference by laboratory staff.	I.8				
Charlemont EOC					
Description: The Charlemont EOC was unable to demonstrate communications with emergency workers in the field. **Recommendation:** The radio base station being installed at the EOC should be completed as soon as possible.	F				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Clarksburg EOC					
Description: Emergency backup electrical power was unavailable at the Clarksburg EOC.	H.3				
Recommendation: Emergency backup electrical power should be obtained, either via a permanently installed generator or via a portable generator that could be mounted on a vehicle (e.g., a fire truck) or kept in reserve elsewhere.					
Florida EOC					
Description: No backup power was available at the Florida EOC.	H.3				
Recommendation: Backup power should be obtained. The source should be either a permanently installed unit or a mobile unit that can be quickly hooked up.					
North Adams EOC					
1. **Description:** No instructions were given at the North Adams EOC regarding zeroing, charging, and using direct-reading dosimeters; decontamination; use of KI; and radiation exposure record keeping.	K.3.a, K.3.b, J.10.e, K.5.a, K.5.b				
Recommendation: All emergency personnel should be given instructions on proper use of dosimeters and procedures for decontamination; use of KI; and maintaining exposure record-keeping forms.					

TABLE 2 REMEDIAL ACTIONS FOR YANKEE ROWE NUCLEAR POWER PLANT
(APRIL 26-27, 1988)

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
North Adams EOC (Cont'd)					
2. **Description:** The status board at the North Adams EOC was not kept current. **Recommendation:** The ECLs should be posted accurately and promptly.	D.3				
3. **Description:** Person designated in the North Adams plan was not effectively in charge of emergency operations at the EOC. **Recommendation:** The alternate(s) designated to be in charge of the EOC should be properly trained.	A.1.d				
4. **Description:** Briefings were informal and inaccurate information was given to the North Adams EOC staff members. **Recommendations:** Periodic briefings should be held in the North Adams EOC and accurate information should be given to the staff.	A.1,b, A.2.a				
5. **Description:** There was no evidence that the North Adams EOC staff was involved in decision making. **Recommendation:** The North Adams EOC staff members should be involved in the decision-making process.	A.1.b, A.2.a				
Rowe EOC **Description:** No data was posted on the plume EPZ map in the Rowe EOC. **Recommendation:** An EOC staff person should be assigned respon-	H.3				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Savoy EOC					
Description: The Savoy EOC had only one commercial telephone available for the staff.	F				
Recommendation: Additional telephone lines should be procured for use by the Savoy EOC staff.					
Greenfield Reception Center					
1. **Description:** The firemen at the Greenfield Reception Center were not sufficiently trained in decontamination procedures.	J.12				
Recommendation: Additional training in decontamination and radiological monitoring procedures should be provided for the firemen.					
2. **Description:** Only one survey instrument had audio equipment and low-level radiation survey capability at the Greenfield Reception Center.	J.12				
Recommendation: Additional instruments with audio equipment and low-level radiation survey capability should be provided at the Greenfield Reception Center for use in radiation monitoring.					

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Williamstown Reception Center					
1. **Description:** Floor coverings and additional visual aids are needed to prevent the spread of contamination within the Williamstown Reception Center. **Recommendation:** A four-foot-wide absorbent paper with a plastic backing should be obtained for use as a disposable floor covering between the relocation and monitoring areas. This item should be added to the list of supplies in TAB A, Attachment 2, p. 2-A-1, of the plan. In addition, visual aids (e.g., rope on moveable posts, instructions, and arrows) should be provided for controlling and informing the evacuees.	J.12				
2. **Description:** The emergency workers performing radiation monitoring of evacuees and the operator of the CD radio at the Williamstown Reception Center were inadequately trained. **Recommendation:** Additional training should be provided for the Williamstown Reception Center staff, with emphasis on radiological monitoring procedures and operation of the CD radio.	J.12				
Vermont EOC					
1. **Description:** The decision chain in the Vermont EOC plan for authorizing emergency workers to receive radiation doses in excess of the PAGs is unclear. **Recommendation:** The section in the Vermont EOC plan on radiation doses in excess of the PACs should be clarified as to the	K.4				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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 EOC (Cont'd)					
2. **Description:** Procedures were not evident in the Vermont EOC as to EBS message preparation, verification by EBS radio station(s), activation of tone-alert radios and sirens, and message broadcast. **Recommendation:** Procedures should be developed and followed by Vermont EOC staff members as to EBS message preparation, verification by EBS radio station(s), activation of tone-alert radios and sirens, and message broadcast. All elements of these procedures should be demonstrated at the next exercise in which Vermont participates.	A.2.a, E.6				
3. **Description:** Discussions were not held in the Vermont EOC for conducting route alerting where siren coverage may be minimal, or notifying institutions and special population groups. **Recommendation:** Discussions should be conducted by Vermont EOC staff members as to the need for conducting route alerting, as well as notifying institutions and special population groups.	E.6, F.1.b				
4. **Description:** The State of Vermont had an inadequate supply of dosimeters available for State emergency workers. **Recommendation:** The State of Vermont should acquire additional dosimetry for use by State emergency workers.	K.3.a				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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 Field Monitoring					
1. **Description:** According to Vermont field monitoring team members, their monitoring and counting equipment is calibrated yearly; however, the instruments did not have proper calibration stickers. **Recommendation:** Vermont field monitoring team members should ensure that equipment brought into the field is properly labeled and that calibration dates have been properly recorded. All monitoring equipment should be clearly labeled as having been calibrated at least annually.	H.10				
2. **Description:** Vermont field monitoring team members did not understand the techniques required to minimize cross-contamination in sample counting. **Recommendation:** Additional instruction should be provided in preparing and handling samples for counting in order to reduce the possibility of cross-contamination.	I.8				
3. **Description:** Vermont field monitoring teams demonstrated their ability to take air samples by closely following written procedures; however, tweezers were not available to remove and handle the particulate filter to minimize cross-contamination. **Recommendation:** Although an equipment checklist was available to team members, tweezers were omitted from the list. The checklist should be revised, and all appropriate equipment, including tweezers, should be on	I.8				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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 Field Monitoring (Cont'd)					
4. **Description:** The air-sampling pumps used by the Vermont field monitoring teams were inadequate. It would have taken more than four and one-half hours at the prescribed flow rate before 20 ft^3 of air would have passed through the particulate filter and silver zeolite cartridge, and radioisotopes, including radioiodines at 10^{-7} µCi/cc, could have been properly detected.	I.8, I.9				
Recommendation: The Vermont field monitoring teams should be provided with high-volume air-sampling pumps capable of providing a flow rate of 1.5-2 cfm.					
Halifax EOC					
Description: Telephone numbers for hospitals, local utilities, etc. were not readily available in the Halifax EOC.	F				
Recommendation: A list should be prepared and posted in the EOC of all important telephone numbers (e.g., hospitals, local utilities, etc.).					

TABLE 2 REMEDIAL ACTIONS FOR YANKEE ROWE NUCLEAR POWER PLANT
(APRIL 26-27, 1988)

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Media Center					
1. **Description:** Backup emergency electrical power was unavailable at the Media Center. **Recommendation:** Backup emergency electrical power should be provided at the Media Center.	G.3.a				
2. **Description:** The Media Center did not have sufficient electrical power outlets for the electrical requirements of news media equipment (e.g., computers, typewriters, television camera lighting). **Recommendation:** A contingency agreement should be negotiated with the local utility to provide for the electrical power requirements of the news media.	G.3.a				
3. **Description:** Only three telephone lines were available in the Media Center for reporters, which is unrealistic in view of the probable heavy demand by reporters. **Recommendation:** A contingency agreement should be arranged with the local telephone company to provide additional telephones in the news media work area.	G.3.a				

TABLE 2 REMEDIAL ACTIONS FOR YANKEE ROWE NUCLEAR POWER PLANT
(APRIL 26-27, 1988)

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
4. **Description:** Although radios and a television set were available in the Media Center for monitoring the news, one AM radio did not work and the other radios and the television set were not actively monitored. **Recommendation:** Media Center procedures should be revised to improve the effectiveness of monitoring personnel. The required training should encompass the following: checking equipment; replacing equipment, if needed; establishing monitoring positions and noting responsibilities; deciding upon tours of duty; and, providing for monitoring reports for each news medium monitored.	G.4.b				
5. **Description:** The Media Center staff spent virtually no time conferring in advance of each news media briefing. The result was often extemporaneous and poorly organized presentations. **Recommendation:** Media Center procedures should be revised to provide for staff conferences before the news briefings in order to decide what will be presented and to anticipate possible news media questions.	G.4.b				

Deficiencies/Areas Requiring Corrective Action and RAC Recommendations 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
Media Center (Cont'd)					
6. **Description:** At Media Center briefings, the status board was not used as a public information tool to assist the reporters. The status board would have given the news media a point of reference as to current events. **Recommendation:** Media Center procedures should be revised to require use of a status board. The responsibility for keeping it current and making it available to the news media at all times should be appropriately assigned.	G.4.b				
7. **Description:** The first State of Vermont news release at the Media Center erroneously identified the declaration of an Alert ECL as resulting from "leaking of main coolant." **Recommendation:** All news releases covering the technical aspects of the incident should be reviewed by utility and State technical personnel prior to being released.	G.4.b				
8. **Description:** The State of Vermont issued news releases and EBS messages; however, they were never distributed in hard-copy form in the Media Center. **Recommendation:** The State of Vermont representatives in the Media Center should distribute in hard-copy form all issued news releases and EBS messages.	G.4.b				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
82-1.	Deficiencies in emergency operations facilities and resources were noted, primarily in communications equipment. Telephone lines, radio-pagers, and backup systems were considered weak. (3.1.2.1)	3/25/82	N/A	5	3	F.1.b, F.1.d	Hawley		Yes (4/6/83) Yes (4/26/88)	The EOC has been relocated and has adequate facilities. The communication systems were adequate and worked well.	C
82-2.	Deficiencies in emergency operations facilities and resources were noted, primarily in communications equipment. Telephone lines, radio-pagers, and backup systems were considered weak. (3.1.2.1)	3/25/82	N/A	5	3	F.1.b, F.1.d	Monroe		Yes (4/6/83) Yes (4/26/88)	Communication systems were adequate, however, problems were experienced in receiving messages from Area IV EOC.	C
									Yes (8/24/88)	Messages from Area IV EOC were clearly understood.	
82-3.	Accident assessment capabilities at Monroe/ Monroe Bridge were deficient in areas of evaluation of field data and assessment of radiological hazards. (3.1.2.2)	3/25/82	N/A	7	6	I.8	Monroe, Mass DPH		Yes (4/6/83) No (4/26/88)	This is more a state function than local. The EOC staff was knowledgeable of accident assessment capabilities.	C
82-4.	At Monroe, health, medical, and exposure control measures were lacking; the appropriate emergency response was not demonstrated. The ability to determine, record, and evaluate radiation exposures of emergency workers was lacking. Action guides were not established for	3/25/82	N/A	20	14	K.3.b, K.4, K.5.a, K.5.b	Monroe, Mass DPH		Yes (4/6/83) Yes (4/26/88)	The RADEF officer and EOC staff were knowledgeable on radiological exposure control, monitoring, and decontamination procedures. An adequate supply of equipment was present at the EOC.	C

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YANKEE ROWE NUCLEAR POWER PLANT

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	decontamination of personnel or equipment. Survey instruments were not removed from their packages, and other decontamination supplies were not available. Provisions for disposal of contaminated materials were not available. (3.1.2.3)										
82-5.	A utility representative should be available at the state EOC to provide technical evaluations and propose recommendations for appropriate emergency response actions. (4.1.1.1)	3/25/82	N/A	10	6	C.4	Massachusetts		Yes (4/6/83) Yes (4/26/88)	The EOC had an area assigned for a utility representative.	C
82-6.	At the state EOC relocation centers and shelter areas were not displayed on the available maps. Also, communications between the Massachusetts Area IV CD Headquarters and some local EOCs were sometimes late and confusing. (4.1.1.2)	3/25/82	N/A	4,5	4,3	J.10.a, F.1.b	Massachusetts (Area IV EOC)		Yes (4/6/83) Yes (4/26/88)	The State EOC staff was not aware of the status of relocation centers and shelter areas. Area IV EOC messages to local EOCs were sometimes delayed.	C
									Yes (8/24/88)	The State EOC staff was aware of the status of relocation centers. Area IV EOC messages to local EOCs were timely and were clearly understood.	
82-7.	At the EOF, lack of space may lead to interference in telephone and radio communications. More space is also needed to accommodate field teams and security personnel. (4.1.1.3)	3/25/82	N/A	4	4	F.1.b, H.3	Massachusetts (EOF)		Yes (4/6/83) Yes (4/26/88)	The EOF has been relocated to an excellent facility in Buckland.	C

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

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82-8.	Procedures for use by the State Police Headquarters need to be revised to include contingency measures when Massachusetts DPH personnel cannot be reached in the initial alert call-up. (4.1.1.4)	3/25/82	N/A	1	2	E.2	Massachusetts		Yes (4/6/83) Yes (4/26/88)	Procedures were adequate for notification of MDPH personnel during the off-hours exercise.	C
82-9.	MCDA needs training on how to work with State Police dispatchers so that SOPs are properly followed. Plans and SOPs need further revision to achieve more prompt communications. (4.1.1.5)	3/25/82	N/A	5	3	E.6, F.1.b, F.1.e	Massachusetts		Yes (4/6/83) Yes (4/26/88)	MCDA experienced no problems working with the State Police dispatchers.	C
82-10.	Additional staff and on-the-job training are needed at the Williamstown shelter and reception facility to administer the plan, which had not been approved at the time of the exercise. Also, the location of the facility is within 5 miles of the 10-mile EPZ, which is not in accordance with NUREG-0654 guidelines. It is suggested that the location of this facility be reviewed and a determination made as to whether its location may adversely affect public protection capabilities. (4.1.1.6)	3/25/82	N/A	27	4,.0	A.2.a, J.10.h	Williamstown		Yes (4/6/83) Yes (4/26/88)	The revised plan has been approved and sufficient staff was available to handle activities at the reception center. The center is not within 5 miles of the 10-mile EPZ. However, additional training is needed by the staff, especially in evacuee monitoring and decontamination procedures.	I

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YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
82-11.	Hard-copy press releases would improve communications between the state EOC and the Media Center. (4.1.1.7)	3/25/82	N/A	4	5	G.4.b	Massachusetts		Yes (4/6/83) Yes (4/26/88)	The State EOC press releases were transmitted via telefacsimile to the Media Center.	C
82-12.	In future exercises, the tollfree number presented in the Emergency Public Information Brochure should be tested to ensure that it functions properly. (4.1.1.8)	3/25/82	N/A	26	5	G.4.c	Massachusetts (Media Center)		Yes (4/6/83) Yes (4/26/88)	The rumor control tollfree number was tested during the exercise.	C
82-13.	More training and upgraded radiation survey should be provided for state field monitoring teams. (4.1.1.9)	3/25/82	N/A	7	7	I.7, I.8	Massachusetts		Yes (4/6/83) Yes (4/26/88)	The field team members were knowledgeable and performed their functions well.	C
82-14.	Processing of samples for radiological contamination may not be feasible at the EOF if background radiation levels are elevated. This is because the EOF is located close to the plant (0.5 mile) and may be vulnerable to excessively high radiation levels. (4.1.1.10)	3/25/82	N/A	4,8	6	H.12	Massachusetts		Yes (4/6/83) Yes (4/26/88)	The EOF has been relocated to Buckland, which is approximately 12 miles from the plant.	C
82-15.	The criteria for allowing reentry should include consideration of the nature of the contaminant and consequences of the ingestion pathway. (4.1.1.11)	3/25/82	N/A	35	6	H.1	Massachusetts		Yes (4/6/83) Yes (4/26/88)	Appropriate reentry considerations were discussed relative to dose assessment, sampling and population dose commitment data.	C

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YANKEE ROWE NUCLEAR POWER PLANT

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
82-16. Primary and backup communication system improvements would increase the effectiveness of EOCs at Charlemont. (4.1.2.15)	3/25/82	N/A	5,2	3 F.1.d	F.1.b,	Charlemont		Yes (4/6/83) Yes (4/26/88) Yes (8/24/88)	Communication problems were experienced from Area IV EOC at first during the exercise. Messages from Area IV EOC were clearly understood.	C
82-17. Primary and backup communication system improvements would increase the effectiveness of the EOC at Florida. (4.1.2.15)	3/25/82	N/A	5,2	3	F.1.b, F.1.d	Florida		Yes (4/6/83) Yes (4/26/88) Yes (8/24/88)	Communication systems were adequate, however, problems were encountered in receiving timely messages from Area IV EOC. Messages from Area IV EOC were clearly understood.	C
82-18. Internal communications at Colrain would be improved with addition of status display boards. (4.1.2.16)	3/25/82	N/A	4	4,13	F.1	Colrain		Yes (4/6/83) Yes (4/26/88)	Status display boards were clearly posted and thoroughly updated.	C
82-19. Internal communications at Florida would be improved with addition of status display boards. (4.1.2.16)	3/25/82	N/A	4	4,13	F.1	Florida		Yes (4/6/83) Yes (4/26/88)	Status display boards were adequate and kept current during the exercise.	C
82-20. Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Buckland		Yes (4/6/83) Yes (4/26/88)	Displays and maps were sufficient and visibly posted at the EOC.	C
82-21. Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Charlemont		Yes (4/6/83) Yes (4/26/88)	Displays and maps were sufficient and visibly posted at the EOC.	C
82-22. Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Clarksburg		Yes (4/6/83) Yes (4/26/88)	Displays and maps were sufficient and visibly posted at the EOC.	C

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YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
82-23.	Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Colrain		Yes (4/6/83) Yes (4/26/88)	Displays and maps were sufficient and visibly posted at the EOC.	C
82-24.	Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Hawley		Yes (4/6/83) Yes (4/26/88)	Displays and maps were sufficient to track emergency operations.	C
82-25.	Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Heath		Yes (4/6/83) Yes (4/26/88)	Displays and maps were available, but could have been arranged differently for more effective use.	C
82-26.	Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Rowe		Yes (4/6/83) Yes (4/26/88)	Displays and maps were more than adequate at the EOC.	C
82-27.	Displays and maps of information generally need improvement at the EOCs. (4.1.2.17)	3/25/82	N/A	4	4,13	J.10.a, J.10.b	Savoy		Yes (4/6/83) Yes (4/26/88)	Displays and maps were sufficient to track emergency operations; however, the plume exposure map should be moved to the operations area.	C
82-28.	Operable equipment is needed to provide 24-hour initial response and prompt activation of the Hawley EOC. (4.1.2.18)	3/25/82	N/A	1,5	2,3	A.1.e, E.2	Hawley		Yes (4/6/83) Yes (4/26/88)	The EOC was promptly activated during the off-hours exercise.	C
82-29.	Management of emergency operations at Monroe/ Monroe Bridge needed the Civil Defense Director or another individual qualified to evaluate radiological conditions and controls. (4.2.1.19)	3/25/82	N/A	20,10	6,14	A.1.d	Monroe/ Monroe Bridge		Yes (4/6/83) Yes (4/26/88)	The CD Director was available and was clearly in charge of the EOC operations.	C

TABLE 1: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
82-30.	Equipment for public alerting and notification needed improvement at EOCs. (4.1.2.20)	3/25/82	N/A	13	11	E.5 J.10.c	Hawley		Yes (illegible)	Tone-alert radios have been provided to all residents.	C
82-31.	Equipment for public alerting and notification needed improvement at EOCs. (4.1.2.20)	3/25/82	N/A	13	11	E.5 J.10.c	Florida		Yes (4/26/88)	Tone-alert radios were provided to residents and route alerting teams were dispatched during the exercise.	C
82-32.	Equipment for public alerting and notification needed improvement at EOCs. (4.1.20)	3/25/82	N/A	13	11	E.5 J.10.c	Monroe/ Monroe Bridge		Yes (4/6/83) Yes (4/26/88)	Adequate equipment for public alerting and notification was available and demonstrated during the exercise.	C
82-33.	Monitoring of doses to emergency workers was not well demonstrated. (4.1.2.21)	3/25/82	N/A	20	14	K.3.a, K.3.b	Clarksburg		Yes (4/6/83) Yes (4/26/88)	Monitoring of emergency workers radiation doses was not observed during the exercise.	I
82-34.	Monitoring of doses to emergency workers was not well demonstrated. (4.1.2.21)	3/25/82	N/A	20	14	K.3.a, K.3.b	Heath		Yes (4/6/83) Yes (4/26/88)	The EOC adequately demonstrated the monitoring of doses to emergency workers.	C
82-35.	The state EOC facilities are in a two-story building where communications are difficult, working space is limited, and the environment is noisy. It is suggested that the facility be relocated to a building with more space and be located away from the flood hazard area. (4.2.1.22)	3/25/82	N/A	4	4	H.3	Vermont	Relocated to a new state EOC in Waterbury, Vermont	Yes (4/6/83) Yes (4/26/88)	Sufficient work space was available and the noise level was adequately controlled at the EOC.	C

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YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
82-36.	Communications between the Brattleboro IFO and some Vermont local EOCs indicated that too little information was received by the local EOCs from the IFO. (4.2.1.23)	3/25/82	N/A	5,3	1,3	E.1.d	Vermont (IFO)		Yes (4/6/83) Yes (4/26/88)	Communications between the Dummerston IFO and the Vermont local EOCs was adequate.	C
82-37.	Dose limits imposed for radiation emergency workers are extremely conservative and could cause severe problems for those performing field monitoring. Radiological health proceduces hamper emergency workers by limiting radiation exposure to a conservative dose which is equivalent to a small fraction of protective action guides. (4.2.1.24)	3/25/82	N/A	6	6	I.7, I.8.	Vermont		Yes (4/6/83) Yes (4/26/88)	The State plan and operating procedures for plume monitoring has been revised to remove the extremely conservative dose limits imposed for radiation emergency workers.	C
82-38.	Criteria should be established for administering potassium iodide to emergency workers. (4.2.1.25)	3/25/82	N/A	21,22	1	J.10.e	Vermont		Yes (4/6/83) Yes (4/26/88)	Criteria have been established for administering KI to emergency workers.	C
82-39.	There is no evidence that an acceptable decision chain has been established to authorize exposure for emergency workers in excess of PAGs. (4.2.1.26)	3/25/82	N/A	3	1	K.4	Vermont		Yes (4/6/83) Yes (4/26/88)	The [illegible] chain for authorizing emergency workers to receive radiation doses in excess of the PAGs needs further clarification in the State plan.	I

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
82-40.	Backup communications systems are needed at Readsboro; additional telephones are needed. Posting of displays and maps also need improvement at Readsboro. An auxiliary power supply is needed. (4.2.2.28)	3/25/82	N/A	5,4	3,4	F.1.a, F.1.b, F.1.d, J.10.a	Readsboro		Yes (4/6/83) Yes (4/26/88)	Communication systems were adequate at the EOC. Displays and maps were inadequate. An emergency power supply was not available at the EOC.	I
82-41.	The Halifax plan needs to be made available at the EOC to assure that acceptable alerting and mobilizations procedures are carried out. (4.2.2.29)	3/25/82	N/A	13,14	1,11	E.1, E.2	Halifax		Yes (4/6/83) Yes (4/26/88)	Several copies of the recently revised town plan were available at the EOC.	C
82-42.	At the Stamford EOC, public alerting and notification systems (NOAA) did not operate properly; sirens were not available. Additional equipment and on-the-job training is suggested to improve capability. (4.2.2.30)	3/25/82	N/A	13	11	I.7	Stamford		Yes (4/6/83) Yes (4/26/88)	The NOAA tone alert radios operated well. A special telephone was used to alert individuals with no NOAA radios. Route alerting also was demonstrated during the exercise.	C
82-43.	At Readsboro, a qualified radiological health officer is needed to improve field monitoring capabilities. (4.2.2.31)	3/25/82	N/A	7	6	I.7	Readsboro		Yes (4/6/83) Yes (4/26/88)	The EOC staff was knowledgeable of radiological exposure control and monitoring procedures.	C
82-44.	Responsibilities for decontamination need to be clarified at the Whitingham EOC. (4.2.2.32)	3/25/82	N/A	20	14	J.12	Whitingham		Yes (4/6/83) No (4/26/88)	The responsibilities still need to be clarified and staff need additional radiological training.	I

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	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
83-1.	Communications from the state to some Massachusetts local EOCs via the Area IV EOC were not sufficient and timely. (3.1)	4/6/83	N/A	5	6	F.1.b	Massachusetts (Area IV EOC)		Yes Yes (4/26/88)	Many local EOCs indicated that messages transmitted from Area IV EOC were at times garbled, incomplete, or delayed.	C
									Yes (8/24/88)	Area IV EOC messages to local EOCs were timely and were clearly understood.	
83-2.	The communication system was not satisfactory. Only one telephone was available and was not sufficient for maintaining contact with the state. (3.2)	4/6/83	3.1.2.1 (3/25/82)	5	8	F.1.b	Monroe		Yes Yes (4/26/88)	A CD radio was in the EOC with RACES and commercial telephone as backup.	C
83-3.	NOAA tone alert radios did not always work effectively. (3.3)	4/6/83	N/A	13	9	F.1.b	Buckland		Yes Yes (4/26/88)	The NOAA tone alert radios worked well during the exercise.	C
83-4.	NOAA tone alert radios did not always work effectively. (3.3)	4/6/83	N/A	13	9	F.1.b	Cl[illegible]-ksburg		Yes Yes (4/26/88)	The NOAA tone alert radio worked well at the EOC.	C
83-5.	NOAA tone alert radios did not always work effectively. (3.3)	4/6/83	N/A	13	9	F.1.b	Monroe		Yes Yes (4/26/88)	The NOAA tone alert radio at the local EOC worked properly during the exercise.	C
83-6.	The state did not provide permanent exposure record devices for the local EOCs. (2.1.1.1)	4/6/83	N/A	20	20	K.3.a	Massachusetts		Yes Yes (4/26/88)	The State provided an adequate number of TLDs to the local EOCs.	C
83-7.	Confusion resulted at some local EOCs as to when to sound sirens. It was not clear whether sirens should be automatically sounded following a Site Area Emergency or a General Emergency notification, or when specific orders are received from the State. (2.1.1.2)	4/6/83	N/A	13	9	E.6	Massachusetts		Yes (8/22/84) Yes (4/26/88)	The State EOC failed to coordinate siren activation with the local EOCs prior to releasing an EBS message.	C
									Yes (8/24/88)	The State EOC adequately coordinated siren activation with the local EOCs prior to releasing an EBS message.	

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83-8.	Monroe Bridge residents were ordered by the Massachusetts EOC to evacuate, but the Vermont EOC was not informed. (2.3.1.2)	4/6/83	N/A	3	15	F	Massachusetts	Interstate protocol is under review. (Letter from Vermont 2/22/84).	Yes Yes (4/26/88)	Coordination activities between the Massachusetts EOC and the Vermont EOC was inadequate in relation to EBS messages being released.	C
									Yes (8/24/88)	Coordination activities between the Massachusetts and Vermont EOCs was adequate in relation to EBS messages being released.	
83-9.	During the move from the EOF to the alternate EOF, there was no dose assessment capability. The Massachusetts plan does not provide for this contingency. (2.5.1.1)	4/6/83	N/A	20	19	A.4, I.8	Massachusetts (EOF)		Yes Yes (4/26/88)	The EOF has been relocated to an excellent facility in Buckland, which is 12 miles from the plant.	C
83-10.	Massachusetts did not demonstrate the capability of 24-hour coverage. Participants were not aware this was an exercise objective. (2.5.1.2)	4/6/83	N/A	2	7	A.1.e, E.2	Massachusetts		Yes Yes (4/26/88)	The 24-hour roster of available staff for the EOC included names of individuals as alternates who would already be participating. Also, a number of additional areas listed no alternatives.	I
83-11.	The Massachusetts staff at the EOF (and alternate EOF) did not optimally utilize their field teams to check the theoretical dose assessments made by the utility. The teams spent most of their time away from the plume and did not track the release through the valley to the 10-mile EPZ boundary. (2.5.1.3)	4/6/83	N/A	20	19	A.3, I.11	Massachusetts (EOF)		Yes Yes (4/26/88)	The Massachusetts staff at the EOF experienced some difficulty in acquiring enough meaningful data for analyses of the overall situation.	I

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83-12.	The Massachusetts field teams did not demonstrate 24-hour capability. (2.5.2.1)	4/6/83	N/A	2	7	A.4	Massachusetts		Yes No (4/26/88)	A roster was available to show 24-hour staffing of field teams.	C
83-13.	The field teams utilized instruments (PIC-6As) which are on loan from the utility and are not permanently available to the state of Massachusetts. (2.5.2.2)	4/6/83	N/A	7	19	H.11, I.8	Massachusetts		Yes Yes (4/26/88)	The utility maintains two complete sets of instruments at the EOF for the sole use by State field teams.	C
83-14.	Monitoring radio and television broadcasts at the Media Center was insufficient. (2.6.2.1)	4/6/83	N/A	4,3	12,10	C.4.b	Massachusetts (Media Center)		Yes Yes (4/26/88)	Radios and a TV were available, however, they were not actively monitored.	I
83-15.	The Town of Rowe did not receive protective action messages from Area IV EOC and did not receive replies to repeated requests for status updates. (2.1.3.1)	4/6/83	N/A	5,3	6	F.1.b	Massachusetts (Area IV EOC)		Yes Yes (4/26/88)	The Town of Rowe received messages in a timely manner from Area IV EOC.	C
83-16.	The Town of Clarksburg did not receive protective action messages from Area IV EOC and did not receive replies to repeated requests for status updates. (2.1.3.1)	4/6/83	N/A	5,3	6	F.1.b	Massachusetts (Area IV EOC)		Yes Yes (4/26/88)	Clarksburg received messages in a timely manner from the Area IV EOC.	C
83-17.	The Town of Clarksburg did not receive proper instructions for sounding of sirens from the Area IV EOC. (2.1.3.2)	4/6/83	N/A	5,3	6	E.6	Massachusetts (Area IV EOC)		Yes Yes (4/26/88)	Clarksburg received proper instructions for sounding of sirens from the Area IV EOC.	C

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83-18.	There was confusion between Williamstown and the Red Cross regarding responsibilities for registration at the reception center. (2.1.4.1)	4/6/83	N/A	27	14	J.12	Williamstown		Yes Yes (4/26/88)	The revised plan clearly stetes each task (e.g., registration) and the responsiblo group.	C
83-19.	Evacuees were not monitored for possible contamination. (2.1.4.2)	4/6/83	N/A	27	14	J.12	Williamstown		Yes Yes (4/26/88)	Evacuees were monitored for possible contamination during the exercise.	C
83-20.	Exposure record forms and permanent exposure record devices such as TLDs and film badges were not available. (2.2.1.1)	4/6/83	N/A	20	20	K.3.a	Buckland		Yes Yes (4/26/88)	Sufficient quantities of exposure record forms and TLDs were available at the EOC.	C
83-21.	Capability for round the clock staffing was not demonstrated. The EOC staff expressed some doubts as to how it would be done. (2.2.2.1)	4/6/83	N/A	2	7	A.4	Charlemont		Yes Yes (4/26/88)	The EOC demonstrated 24-hour staffing by presentation of a current roster of available individuals.	C
83-22.	Exposure record keeping forms and permanent exposure record devices were not in hand. (2.2.2.2)	4/6/83	N/A	20	20	K.3.b	Charlemont		Yes Yes (4/26/88)	Sufficient quantities of exposure record forms and TLDs were available at the EOC.	C
83-23.	Permanent exposure record devices were not available at the EOC and instructions for using dosimeters were not clear.	4/6/83	N/A	20	20	K.3.a, K.3.b	Clarksburg		Yes Yes (4/26/88)	TLDs were available at the EOC and emergency workers were instructed on the use of dosimeters.	C

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83-24.	Permanent exposure record devices were not available at the EOC. (2.2.4.1)	4/6/83	N/A	20	20	K.3.a	Colrain		Yes Yes (4/26/88)	The supply of TLDs at the EOC was adequate and available for emergency workers.	C
83-25.	Backup power was not available to sustain communications. (2.2.5.1)	4/6/83	N/A	5,4	6	F.1.a	Florida		Yes Yes (4/26/88)	Emergency backup power was not available at the EOC, but will be in the new facility.	I
83-26.	A backup communications system to the primary (telephone) system did not exist. (2.2.5.2)	4/6/83	N/A	5,4	6,8	F.1.a, F.1.e	Florida		Yes Yes (4/26/88)	RACES was the backup communication system at the EOC.	C
83-27.	Permanent exposure record devices were not available at the EOC. (2.2.5.3)	4/6/83	N/A	20	20	K.3.a	Florida		Yes Yes (4/26/88)	Sufficient quantities of TLDs were available at the EOC.	C
83-28.	Activation of the EOC was not timely. (2.2.6.1)	4/6/83	N/A	1	7	E.2	Hawley		Yes Yes (4/26/88)	The EOC was promptly activated.	C
83-29.	Staffing of the EOC was not complete and capability for 24-hour staffing was not demonstrated. (2.2.6.2)	4/6/83	N/A	1,2	7	A.4	Hawley		Yes Yes (4/26/88)	The EOC was fully staffed. 24-hour staffing was demonstrated by presentation of a roster.	C
83-30.	The EOC staff showed a lack of knowledge and training in protective action guides and contamination monitoring. (2.2.6.3)	4/6/83	N/A	20	20	K.3.a, K.5.a	Hawley		Yes Yes (4/26/88)	The EOC staff was knowledgeable in PAGs and contamination monitoring.	C

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83-31.	Staffing and resources are insufficient for sustaining 24-hour operations. (2.2.7.1)	4/6/83	N/A	2	7	A.4, H.3	Heath		Yes Yes (4/26/88)	Staffing and resources were sufficient for 24-hour operations of the EOC.	C
83-32.	The communication system consisted of a single telephone with no backup and is not adequate for maintaining communications. (2.2.8.1)	4/6/83	3.1.2.1 (3/25/82)	5	6	F.1.d	Monroe		Yes Yes (4/26/88)	A CD radio was in the EOC with RACES and commercial telephone as a backup.	C
83-33.	Not all radio pagers worked. This caused delay in staffing the EOC. (2.2.8.2)	4/6/83	3.1.2.1 (3/25/82)	1	7	F.1.e	Monroe		Yes Yes (4/26/88)	The Monroe EOC was fully staffed in a timely manner.	C
83-34.	Permanent-exposure record devices were not available at the EOC. (2.2.8.2)	4/6/83	N/A	20	20	K.3.a	Monroe		Yes Yes (4/26/88)	The supply of TLDs was adequate and available for emergency workers.	C
83-35.	Wind direction information received from the state was confusing. (2.2.9.1)	4/6/83	N/A	11,3	6,10	E.4.g	North Adams		Yes Yes (4/26/88)	Wind directions were received from the State EOC and plotted on a map.	C
83-36.	It is not clear when and at what emergency action levels the public is to be notified. (2.2.9.2)	4/6/83	N/A	3	10	D.4	North Adams		Yes Yes (4/26/88)	The local plan clearly defines at what ECL the public is to be notified.	C
83-37.	Permanent exposure record devices were not available at the EOC. (2.2.9.3)	4/6/83	N/A	20	20	K.3.a	North Adams		Yes Yes (4/26/88)	The supply of TLDs was adequate and available for emergency workers.	C
83-38.	Permanent exposure record devices were not available at the EOC. (2.2.10.1)	4/6/83	N/A	20	20	K.3.a	Rowe		Yes Yes (4/26/88)	The supply of TLDs was adequate and issued to emergency workers.	C

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83-39.	Permanent exposure record devices were not available at the EOC. (2.2.11.1)	4/6/83	N/A	20	20	K.3.a	Savoy		Yes Yes (4/26/88)	TLDs were available in sufficient quantities at the EOC.	C
83-40.	The staff lacked knowledge of procedures for reporting dosimeter readings from the field and was not aware of the maximum allowable dose. (2.2.11.2)	4/6/83	N/A	20	20	K.3.b, K.4	Savoy		Yes Yes (4/26/88)	The RADEF officer was knowledgeable of radiological exposure control procedures as well as the EOC staff.	C
83-41.	Technical information received by the Incident Director did not reach the appropriate staff members. (2.3.1.1)	4/6/83	N/A	3	8	F	Vermont	Message handling is being analyzed, the new EOC in Waterbury has an improved operations room. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	Message handling in the State EOC was excellent and frequent staff briefings were conducted.	C
83-42.	Guidelines for reentry were not tested as stated in the exercise objectives. (2.3.1.3)	4/6/83	N/A	35	2	M.1	Vermont	Guidelines for reentry and recovery have been tested in the 21 September 1983 Vermont Yankee Exercise. (Letter from Vermont 2/22/84)	Yes Yes (4/27/88)	Guidelines for reentry were adequately demonstrated by discussions held during the ingestion pathway part of the exercise.	C
83-43.	Confusion existed regarding the need to notify the local warning point at Rockingham of emergency classification upgrades and plant status reports and whether subsequent notification should come from the state EOC in Montpelier. (2.3.2.1)	4/6/83	N/A	3	8	D.4	Vermont	Procedures have been rewritten and training is in progress to correct this deficiency. Also, the State Warning Point is now located in Waterbury along with the Main EOC. Coordination is vastly improved. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	The State EOC has assumed the responsibility and adequately performed this function during the exercise.	C

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83-44.	The staff at the state warning point in Middlesex indicated that if an emergency were to occur during a weekend, it would be difficult to perform callout expeditiously as only one dispatcher would be on duty. However, the Vermont plan indicates that two dispatchers are on duty at all times. (2.3.2.2)	4/6/83	N/A	2,1	3	C.4	Vermont	Some a 037. Additionally, the Commissioner of Public Safety has indicated this concern to be an area of priority review. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	One dispatcher was on duty and adequately handled all traffic flow during the exercise.	C
83-45.	The Vermont civil defense call signs are not clearly differentiated from the Vermont state police call signs. This creates confusion during high radio traffic periods because the individual receiving the call at Rockingham is not sure who it is coming from. (2.3.3.1)	4/6/83	N/A	5	8	F.1.d	Vermont	This has been addressed by training respondees to clearly identify Civil Defense calls, as differentiated from normal non-Civil Defense operations. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	No problems were experienced during the exercise with communication systems.	C
83-46.	Location of the Incident Field Office facilities in Brattleboro on three levels and background noise that interfered with the intercom system hampered communications and coordination. (2.3.4.1)	4/6/83	N/A	4	8	H.3	Vermont (IFO)	A new IFO is planned for the near future. It will be housed with District 2 Transportation Headquarters. The site for the building has been selected and design is underway. For the short term, message handling will be analyzed. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	The IFO has been relocated to excellent facilities at the District 2 Transportation Headquarters in Dummerston.	C

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83-47.	Information on alerting and evacuating the handicapped was not available in written form. (2.4.1.1)	4/6/83	N/A	18	8	J.10.d	Readsboro	The REP Planner for Vermont will contact Readsboro response personnel in order to correct this concern. (Letter from Vermont 2/22/84)	Yes No (4/26/88)	The local plan addresses alerting and evacuation of special needs persons, however, a written list of such individuals was not available.	I
83-48.	Some personnel were not familiar with dosimetry and communication procedures. (2.4.2.1)	4/6/83	N/A	20	1	K.3.a. K.3.b, F	Stamford	Training has been scheduled. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	The EOC staff was knowledgeable in the use of dosimetry and communication procedures.	C
83-49.	The capability of using dosimeters was not demonstrated. (2.4.2.2)	4/6/83	N/A	20	1	K.3.a, K.3.b	Stamford	Training has been scheduled. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	The EOC staff demonstrated the use of dosimeters.	C
83-50.	The EOC staff did not demonstrate an adequate understanding of the proper frequency for reading dosimeters, proper exposure record keeping procedures, or the maximum allowable dose. (2.4.3.1)	4/6/83	N/A	20	1	K.3.a, K.3.b, J.10.e	West Halifax	Each of these sections indicates a need for training. It should be understood that the emergency response personnel of Halifax are limited in the amount of time available to the demand of REMP (the entire town is 400+ individuals). However, the State RADEF Officer is currently inventorying training needs and will arrange for necessary contingent on the outcome of survey. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	The EOC staff members [illegible] knowledgeable of [illegible]se of dosimeters and the maximum allowable dose.	C
83-51.	Maps of evacuation routes, relocation centers and access control points were not available, nor did the available maps have populations by sector identified. (2.4.4.1)	4/6/83	N/A	4	None	J.10.a, J.10.b	Whitingham	Maps will be supplied to the EOC before the next exercise. (Letter from Vermont 2/22/84)	Yes No (4/26/88)	The EOC had all necessary maps except the population by evacuation area map.	I

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83-52.	Permanent exposure record equipment such as film badges and TLDs were not available. (2.4.4.2)	4/6/83	N/A	20	1	K.3.a, K.3.b	Whitingham	Vermont believes the need for permanent exposure records is not necessary. Whitingham has dosimeters and record cards. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	TLDs are now available for emergency workers.	C
83-53.	The staff did not have a RADEF officer as called for in the local plan and none of the staff were trained regarding use of dosimetry equipment, record keeping, maximum dose allowed without authorization, decontamination procedures, or use of potassium iodide. (2.4.4.3)	4/6/83	4.2.2.J2 (3/25/82)	20	1	K.3.b, K.4	Whitingham	Training needs are being inventoried and will be provided as necessary by the State RADEF Officer. (Letter from Vermont 2/22/84)	Yes No (4/26/88)	The EOC now has a RADEF officer, however, the staff members were not knowledgeable of radiological exposure control procedures.	I
83-54.	During the move from the EOF to the alternate EOF, there was no dose assessment capability. The Vermont plan does not provide for this contingency. (2.5.1.1)	4/6/83	N/A	20	1	A.4, I.8	Vermont (EOF)	Vermont will address this concern by sending the dose assessment backup team to the alternate EOF in order to set up operations, prior to the closing of the primary EOF. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	The EOF has been relocated to an excellent facility in Buckland, which is 12 miles from the plant.	C
83-55.	Vermont did not demonstrate the capability of 24-hour coverage. Participants were not aware this was an exercise objective. (2.5.1.2)	4/6/83	N/A	2	5	A.4	Vermont	Vermont does have 24-hr coverage. Primary dose assessment is performed by the Department of Health. Backup is provided by Civil Defense staff (VRERP 9.14, 9.12). (Letter from Vermont 2/22/84)	Yes No (4/26/88)	The State EOC demonstrated 24-hour coverage by presentation of a roster.	C
83-56.	Monitoring radio and television broadcasts at the Media Center was insufficient. (2.6.2.1)	4/6/83	N/A	4,3	8,13	G.4.b	Vermont (Media Center)	Discussions with a utility representative has revealed that additional radios and televisions were present but not seen by the FEMA observer. (Letter from Vermont 2/22/84)	Yes Yes (4/26/88)	Radios and a TV were available, however, they were not actively monitored.	I

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84-5.	Troopers handling emergency response at the barracks for this exercise were unfamiliar with dosimetry and decontamination procedures. They were also unsure of their responsibilities for actions other than access and traffic control. (2.1.4.1)	8/22/84	N/A	20,29	(M)10	K.3,K.4 -K.5	Massachusetts		No (4/26/88)	The State Police activities at the barracks were not observed during the 1988 exercise.	I
84-6.	The firemen responsible for decontamination were untrained in procedures. (2.1.5.1)	8/22/84	N/A	29	(M)13	K.5.a	Greenfield		Yes (4/26/88)	The firemen responsible for monitoring and decontamination need additional training.	I
84-7.	Personnel designated in the plan (see MCDA Area IV Plan, Annex E) for registering and monitoring (RAMONT teams) evacuees did not participate. This was an exercise objective. (2.1.5.2)	8/22/84	N/A	1,2,27	(M)1,13	J.12, M.1.b	Greenfield		Yes (4/26/88)	Personnel responsible for registering and monitoring evacuees (e.g., college, Red Cross) demonstrated their activities during the exercise.	C
84-8.	The Area IV Plan conflicts with the Greenfield (Hoot Community) Plan regarding who is responsible for specific tasks such as registration. (2.1.5.3)	8/22/84	N/A	1,3,27	(M)1,2,13	J.12, P.4	Greenfield		No (4/26/88)	The revised plan clearly states who is responsible for each task (e.g., registration) by listing the responsible agency.	C
84-14.	No permanent reading dosimeters are available for use by emergency workers. (3.1.1.2)	8/22/84	N/A	20	(V)None	K.3	Vermont		6/11/86 Yes (4/26/88)	Not corrected. TLDs are available for use by emergency workers.	C

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84-15.	The fact that the IFO facilities are located on three floors hampered a good overall view of what was happening. For example, the Health Department, which is located in the basement, received separate messages from Waterbury and the upstairs communications center was not aware of this when the radiological field teams were dispatched. (3.1.2.1)	8/22/84	N/A	3,4,5	(V)2,3,4	H.3	Vermont (IFO)		6/11/86	Partially corrected. The physical arrangement of the facility has not changed. An intercom system was used to provide more contact between the Health Department downstairs and the other agencies upstairs. There was a substantial amount of interchange over this system, but again the key fact of field team departure was not reported to the other agencies.	C
									Yes (4/26/88)	The IFO has been relocated to a new building in Dummerston which has excellent facilities. Interactions between all participating organizations was conducted in an orderly fashion.	
84-17.	Recovery and reentry activities were neither discussed nor actually demonstrated. (3.2.1.2)	8/22/84	N/A	3,35	(V)2,11	H.1	Halifax		No (4/26/88)	Recovery and reentry activities were not demonstrated at the EOC.	I
84-22.	In the EOF, some of the rotary dial telephones at the Vermont desk were inoperative. (4.1.1)	8/22/84	N/A	4,5	(V)3,4	F.1.d	Vermont (EOF)		Yes (4/26/88)	The telephones at the Vermont desk worked well.	C

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84-23.	Radio relay problems exist with the field monitoring teams. (4.2.1.1)	8/22/84	N/A	5,6	(M)4,5	F.1.d	Massachusetts		6/11/86	Not corrected. A Health Department staff person was stationed on a mountain top to act as a relay between the field teams and the EOF. This is the same problem and operational fix as observed previously. It allows for continuous contact but is time consuming and a waste of DPH personnel. A permanent repeater would be more efficient.	I
									Yes (4/26/88)	Problems were still encountered with radio communications between the field teams and the EOF.	
84-24.	Field monitoring teams did not have permanent record dosimeters such as film badges or TLD's. (4.2.2.1)	8/22/84	N/A	20	(V)None	K.3.a	Vermont		6/11/86	Partially corrected. Both members of team 155 had film badges. On team 156, the Department of Public Health person had a permanent record device but the Department of Agriculture representative did not.	C
									Yes (4/26/88)	The field team members were provided with a film badge and a TLD.	

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84-25.	The lab is nor yet ready to do quantitive analyses of the volume and variety of samples of food, water, milk, etc., which would result from this type of accident. (4.3.1.1)	8/22/84	N/A	4,9	(H)3	J.9	Massachusetts		Yes (4/77/88)	The laboratory has limited capability and only one shift of personnel available. The plan provides for backup support with necessary capabilities.	C
84-26.	State Rad Health Labs are not yet geared up to handle a high volume of environmental samples with relatively high and complex activity. Written protocol instructions for processing and analysis of radioactive samples are probably not sufficient for a serious release resulting from core damage and a large area release. (4.3.2.1)	8/22/84	N/A	4,9	(V)3,6	H.12	Vermont		No (4/27/88)	The capability has been improved at a new State laboratory, however, support from other laboratories is still necessary.	I
84-27.	At the media center, sufficient quantities of typewriters are not available for use by PIO's and the media. (5.1)	8/22/84	N/A	4	(H)3 (V)3	G.3.a, G.4.b	Massachusetts, Vermont (Media Center)		6/11/86 Yes (4/26/88)	Not corrected. The PIOs had a sufficient quantity of typewriters at the Media Center.	C

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84-28.	At the media center, the status board used to brief the media was not left on permanent display in the media briefing area making it difficult for the media to obtain information between briefings. (5.2)	8/22/84	N/A	4	(M)3 (V)3	G.4.c	Massachusetts, Vermont (Media Center)		6/11/86 Yes (4/26/88)	Not corrected. An excellent status board was available, however, it was never used during the exercise.	I
86-1.	Information on evacuation of school children was omitted from public instructions.	6/11/86	N/A	14	(M)11	E.7	Massachusetts (Media Center)		No (4/26/88)	The exercise was off-hours, no schools were in session.	I
86-2.	Field team mobilization procedures were not demonstrated. The teams were prepositioned in Greenfield.	6/11/86	N/A	6	(M)6	E.2, I.8	Massachusetts		Yes (4/26/88)	The field team members were dispatched from their home or duty station.	C
86-3.	One of the teams consisted of only one person. This is contrary to Massachusetts procedure and proved to be ineffective in practice.	6/11/86	N/A	6,7	(M)6,7	E.2,I.8, I.11	Massachusetts		No (4/26/88)	Each of the field teams consisted of two members in accordance with their procedures.	C
86-4.	Monitoring procedures were flawed with respect to determining plume presence. The procedures do not call for taking open and closed window readings and ground level measurements. Therefore, there can be no assurance that	6/11/86	N/A	7	(M)7	I.8, III	Massachusetts		Yes (4/26/88)	Monitoring procedures have been revised to include beta and gamma readings at waist level and ground readings.	C

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86-4.	(Cont'd) above background gamma readings taken at three to four feet above ground level are not due to plume shine from above or radiation from previous ground deposition.										
86-5.	Lack of information resulted in unnecessary radiological exposure of local emergency workers at Monroe. The Monroe EOC is located less than a mile from the plant, and the town has an alternate EOC at another location for use when the primary EOC is threatened by a release. The alternate was not used, since Monroe was never informed that there had been a release. This key piece of information should have been forwarded by the State.	6/11/86	N/A	5,20	(M)5,14	F.1.b	Massachusetts, Area IV EOC, Monroe		Yes (8/15/86) Yes (4/26/88) Yes (8/24/88)	The revised procedures and retrained new radio operators resulted in the efficient handling of communications within the Area IV EOC. The State EOC did not coordinate the alert and notification sequence in a timely way. The State EOC did coordinate the alert and notification sequence in a timely way.	C

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86-6.	Currently, no means exist for EOC staff to communicate with emergency personnel in the field (.e.g, traffic control points, personnel on route alert runs, operators of town-owned road equipment). The lack of a communication capability with these functions severely limits the coordination of field activities, the monitoring of exposure to emergency workers, and obtaining progress reports.	6/11/86	N/A	5	(M)5	F.1.e, J.10.k, K.3.a, K.4	Charlemont		Yes (4/26/88)	The EOC is in the process of installing a radio base station for communication with field workers. The system should be completely installed during 1988.	I
86-7.	Representatives from the Highway and Health Departments did not participate in this exercise or the previous one.	6/11/86	N/A	2	(M)2	A.1.b, E.2	Charlemont		Yes (4/26/88)	The Highway and Health Department representatives participated in the exercise.	C
86-8.	The list of mobility-impaired was not up to date.	6/11/86	N/A	15	(M)12	J.10.d	Charlemont		Yes (4/26/88)	The list of mobility-impaired was current.	C
86-9.	Problems were encountered with radio communication to Area IV during the morning.	6/11/86	N/A	5	(M)5	F.1.b	Colrain		Yes (4/26/88)	Problems were encountered with radio communications from Area IV EOC at first during the exercise.	C
									Yes (8/24/88)	Messages from Area IV EOC were clearly understood.	
86-10.	Only partial staffing was demonstrated.	6/11/86	N/A	1	(M)1	E.2	Heath		Yes (4/26/88)	The EOC was fully staffed, including the backup staff.	C

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86-11.	Equipment and procedures for radiological monitoring of evacuees and emergency personnel were not demonstrated.	6/11/86	N/A	27,29	(M)16,17	J.12, K.5.a, K.5.b	Williamstown		Yes (8/19/86)	Equipment and procedures were adequate for radiological monitoring of evacuees and emergency workers.	C
									Yes (4/26/88)	The monitoring of evacuees and emergency personnel was demonstrated during the exercise.	
86-12.	The CD Director and other town staff did not arrive to begin setting up the reception center until about 1:00, about the same time that the first recommendation to evacuate was given to the public. This would have left very little time for setting up the facility before evacuees began arriving. In addition, according to the principal of the school, when school is in session it would take a minimum of one hour to get the students out.	6/11/86	N/A	27	(M)16	J.10.h	Williamstown		Yes (4/26/88)	The reception center was fully staffed and operational in a timely manner.	C

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86-13.	Procedural problems resulted in a deficiency in communications with the licensee. The licensee gave notice of EAL changes to the State representative at the EOF, rather than using the primary system (Nuclear Alert) to communicate directly with the EOC. This method was used on three occasions -- on escalation to Site Area Emergency, on escalation to General Emergency, and on de-escalation back to Site Area Emergency -- despite immediate objections from the Vermont State Director. The result was significant delays in receipt of this crucial information.	6/11/86	N/A	3	(V)2	E.1,	Vermont		Yes (8/15/86)	A letter of agreement has been established between the State of Vermont and Massachusetts and Yankee Atomic which establishes the method for notifying ECL changes to the state.	C
									Yes (4/26/88)	The licensee gave all notices of ECL changes to the State EOC in a timely manner through the use of the dedicated Nuclear Alect communication system.	

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86-14.	The direction and positioning of the Vermont field teams did not produce useful data. Vermont procedures indicate that the teams should be directed to confirm the plume's location by seeking its edge, and then withdraw to minimize their exposure. However, neither team was directed to a location closer than two miles from the plume. Both the teams and the team director at the EOC were using ordinary state highway maps, which did not have sufficient detail to allow for precise direction of the teams.	6/11/86	N/A	7,10	(V)5,6	I.8, I.11, J.10.a	Vermont		Yes (4/26/88)	The field teams were dispatched (simulated) to various locations to await the arrival of the plume if wind direction should change. The plume never entered the State.	1
86-15.	The system for generating NWS and EBS messages needs to be reviewed. The current system does not result in complete messages, and is not sufficiently flexible to accommodate all possible protective action recommendations. Also, it does not result in a complete hard copy for transmission to the Joint Information Center.	6/11/86	N/A	13	(V)7	E.7	Vermont		Yes (4/26/88)	Hard copies of EBS messages were promptly transmitted to the Media Center.	C

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86-16.	No independent dose projections were performed at the EOC, contrary to the plan, which indicates that such calculations will be performed using data provided by the licensee.	6/11/86	N/A	10	(V)6	I.10	Vermont		Yes (4/26/88)	Independent dose projections were performed at the State EOC using the METPAC system.	C
86-17.	Information provided to the spokespersons at the Media Center was incomplete, contributing to the fact that no press releases were issued by Vermont.	6/11/86	N/A	24	(V)8	G.4.a	Vermont (Media Center)		Yes (4/26/88)	Information provided to the Vermont PIO was complete and came directly from the Vermont EOC.	C
86-18.	Permanent record dosimeters have not been distributed to local emergency workers. This repeats an area for corrective action noted in the previous exercise.	6/11/86	N/A	20	(V)10	K.3.a	Vermont		Yes (4/26/88)	TLDs have been provided to the local EOCs for use by emergency workers.	C
86-19.	The Site Area Emergency declaration was not disseminated to all Vermont local EOCs in a timely manner. The Town of Stamford did not receive official notification until 11:55 a.m. and Whitingham did not receive it until 11:43 a.m.	6/11/86	N/A	5	(V)4	E.1	Vermont		Yes (4/26/88)	All affected local EOCs were notified simultaneously of ECL changes via radio with a roll call made to verify the receipt of the notification.	C

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86-20.	The IFC Director was not informed when field monitoring teams were dispatched.	6/11/86	N/A	3	(V)2 (V)3	A.1.b, A.1.d	Vermont (IFO)		No (4/26/88)	The IFO Director was informed of the status of the field teams during the exercise even though they were only simulated being dispatched.	C
86-21.	Notification of EALs to the IFO were late or missed altogether.	6/11/86	N/A	3,5	(V)2,4	E.1	Vermont, IFO		Yes (4/26/88)	The IFO was informed in a timely manner of all ECL changes from the State EOC.	C
86-22.	One of the monitoring team vehicles was not reliable, resulting in a delay of team deployment. The vehicle was not suited to carrying team equipment or negotiating the hilly local terrain, especially in winter.	6/11/86	N/A	7	(V)5	I.8	Vermont		Yes (4/26/88)	The vehicles provided to the two field teams were adequate for all expected terrain and weather conditions.	C
86-23.	One team had two sets of air sampling equipment, while the other had none.	6/11/86	N/A	7	(V)5	H.11, I.8, I.9	Vermont		Yes (4/26/88)	Each team was provided with two low-volume air-sampling pumps.	C
86-24.	Activation procedures broke down when the Alert EAL message was not relayed to the current CD Director.	6/11/86	N/A	1	(V)1	E.2, F.1.e	Readsboro		No (4/26/88)	Activation procedures broke down when the Alert ECL message was not received by the proper personnel and relayed to the EOC.	I
86-25.	None of the town Selectmen participated in the exercise.	6/11/86	N/A	1	(V)1	A.1.b, E.2	Readsboro		Yes (4/26/88)	The town Selectmen participated in the exercise.	C
86-26.	The local school could not respond concerning evacuation procedures.	6/11/86	N/A	3	(V)2	J.10.d	Readsboro		No (4/26/88)	The local school was not in session since the exercise was conducted at night.	I

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86-27.	The Chairman of the Selectmen was the only person who participated fully in the exercise.	6/11/86	N/A	2	(V)1 (V)3	A.1.a, A.2.a A.4	Stamford		Yes (4/26/88)	The EOC was adequately staffed during the exercise.	C
86-28.	The town plan has not been significantly updated since 1986 and is missing important items such as a designated alternate EOC, and arrangements for EBS messages.	6/11/86	N/A	3	(V)2	P.4	Stamford		Yes (4/26/88)	The town plan was recently updated and copies were available and used at the EOC.	C
86-29.	A utility provided technical expert indicated that there had been an off-site release of radiation, when in fact the first release had not yet occurred and would not be announced until the General Emergency, almost an hour later. While he did say that the amount of radiation did not warrant protective measures, his unauthorized issuance of inaccurate information about a subject beyond his responsibility could have caused precipitous actions by the public and hindered the actions and decision-making of the appropriate off-site authorities.	6/11/86	N/A	24,25		C.4.a, C.4.b	Yankee Atomic, Massachusetts, Vermont (Media Center)		Yes (5/15/86)	Training was provided to Media Center staff, coordination among staff was excellent; statements to the media were informative; the technical expert was concise during briefings; and questions from the media were answered promptly and correctly.	C
									No (4/26/88)	The information provided by the utility representative to the states EOCs was accurate during the exercise.	

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85-30.	Sufficient hard copy news releases were not available to the press. The utility regularly generated new releases, but extra copies were not available and only some of them were posted. Massachusetts issued only one news release and Vermont did not issue any.	6/11/86	N/A	24	(M)18	G.4.a	Massachusetts (Media Center)		Yes (4/26/88)	The utility and State issued, posted, and distributed hard copy news releases and/or EBS messages at the Media Center	C
86-31.	Sufficient hard copy news releases were not available to the press. The utility regularly generated new releases, but extra copies were not available and only some of them were posted. Massachusetts issued only one news release and Vermont did not issue any.	6/11/86	N/A	24	(V)8	G.4.b	Vermont (Media Center)		Yes (4/26/88)	The State issued and posted news releases and/or EBS messages, however, they were never distributed in hard copy form in the Media Center.	I
88-1.	Massachusetts EOC staff members were not involved in the decision-making process; decisions were often made by the MCDA Director during his briefing presentations; staff members were not afforded the opportunity of demonstrating their knowledge of emergency roles. (2.1.1.1.1)	4/26/88	N/A	3	3	A.1.a, A.2.a	Massachusetts		Yes (8/24/88)	The MCDA Director maintained constant contact with EOC staff members. Key staff were consulted and their recommendations considered prior to the Director's decision and authorization of actions to be taken.	C

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88-2.	Massachusetts EOC staff members did not follow the public alerting and notification procedures for simulated activation of tone-alert radios and sirens prior to the simulated release of EBS messages at both the site area emergency and general emergency declarations. In addition, a lack of coordination with the State of Vermont was in EBS message content and siren and tone alert radio activation. (2.1.1.1.2)	4/26/88	2.1.1.2 (4/6/83) 2.3.1.2 (4/6/83)	12, 13	16, 17	E.6, F.1.b	Massachusetts		Yes (8/24/88)	Conferencing between MCDA and Vermont Directors; determination of EBS broadcast time; notification of EBS message content; EPZ siren notification; activation of the EBS broadcast; and activation of NWS-NOAA weather receivers were capably demonstrated by the Massachusetts and Vermont EOC staff.	C
88-3.	Massachusetts EOC staff members were not kept informed as to the status (i.e., open or closed) of the relocation and shelter areas. (2.1.1.1.3).	4/26/88	4.1.1.2 (3/25/82)	3, 5	3, 5	J.10.a	Massachusetts				
88-4.	The Massachusetts EOC was unable to provide a complete and current roster of available staff for 24-hour coverage of the EOC. (2.1.1.1.4)	4/26/88	N/A	34	N/A	A.2.a, A.4	Massachusetts				
88-5.	The Massachusetts EOC staff members were not provided periodic information on the implementation of PARs and status of local EOCs. (2.1.1.1.5)	4/26/88	N/A	3	3	A.1.b, A.2.a	Massachusetts				

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88-6.	The Belchertown Area IV EOC had some difficulty early in the exercise with radio transmissions to local EOCs. The messages were sometimes garbled or incomplete and some important messages were delayed in being transmitted to the Florida EOC. (2.1.1.2.1)	4/26/88	3.1 (4/6/83)	4	4	E.6, F.1.b	Massachusetts (Area IV EOC)		Yes (8/24/88)	The Chariemont EOC was activated to test the message traffic between Area IV and the local EOCs. Communication systems functioned properly. Messages to local EOCs were transmitted in a timely fashion and were clearly understood.	C
88-7.	The radio operator's performance during the remedial exercise indicated a lack of familiarity with recognized radio procedures and methodology. (2.1.1.2.2)	8/24/88	N/A	4	4	F	Massachusetts (Area IV EOC)				
88-8.	Radio transmission continued to be a problem for the Massachusetts field monitoring teams. The addition of a repeater on Mount Greylock had not corrected the situation. (2.1.1.3.1)	4/26/88	4.2.1.1 (8/22/84)	4	4	F	Massachusetts				
88-9.	The Massachusetts field teams were not provided with current and accurate maps of the EPZ area and did not indicate the predetermined monitoring points. (2.1.1.3.2)	4/26/88	N/A	7	10	I.8	Massachusetts				

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88-10.	The samples to be analyzed at the laboratory at Jamaica Plain were transported via the main entrance to the "office complex." Such a route would have resulted in contamination if negative smears had not been obtained as a result of the sample-handling process. Contamination control was therefore not acceptable. (2.2.1.4.1.1)	4/27/88	N/A	28	35	I.8	Massachusetts				
88-11.	The staff at the Jamaica Plain laboratory was unable to estimate the uncertainty factors in its measurements. (2.2.1.4.1.2)	4/27/88	N/A	28	35	I.8	Massachusetts				
88-12.	Written operating procedures were not available in the Massachusetts State laboratory at Jamaica Plain, even though the staff had been effectively trained. (2.2.1.4.1.3)	4/27/88	N/A	28	35		Massachusetts				
88-13.	The Massachusetts staff at the EOF did not use the field monitoring teams effectively in order to gather enough meaningful data for analyses of the overall situation. (2.1.3.1.1)	4/26/88	2.5.1.3 (4/6/83)	10	13	I.11	Massachusetts (EOF)				

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Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-14. The Massachusetts staff at the EOF experienced many radio "dead spots" as it attempted to stay in contact with its field monitoring teams. (2.1.3.1.2)	4/26/88	N/A	4	4	F	Massachusetts (EOF)				
88-15. One Massachusetts field sampling team was missing certain equipment, such as direct-reading dosimeters and certain protective clothing. The necessary equipment was available in the utility instrument kit, but the entire kit had been left at the Buckland EOF. (2.2.1.3.1)	4/27/88	N/A	6	6	H.11, K.3.b	Massachusetts				
88-16. The Massachusetts field sampling teams experienced difficulty in communicating with each other and the Buckland EOF. (2.2.1.3.2)	4/27/88	N/A	4	4	F	Massachusetts				
88-17. The Charlemont EOC was unable to demonstrate communications with emergency workers in the field (2.1.1.4.2.1)	4/26/88	6/11/86	4	4	F	Charlemont				
88-18. Emergency backup electrical power was unavailable at the Clarksburg EOC. (2.1.1.4.3.1)	4/26/88	N/A	4, 5	4, 5	H.3	Clarksburg				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-19.	No backup power was available at the Florida EOC. (2.1.1.4.5.1)	4/26/88	2.2.5.1 (4/6/83)	4, 5	4, 5	H.3	Florida				
88-20.	No instructions were given at the North Adams EOC regarding zeroing, charging, and using direct-reading dosimeters; decontamination; use of KI; and radiation exposure record keeping. (2.1.1.4.9.1)	4/26/88	N/A	6	6	K.3.a, K.3.b, J.10.e, K.5.c, K.5.b	North Adams				
88-21.	The status board at the North Adams EOC was not kept current. (2.1.1.4.9.2)	4/26/88	N/A	5	5	D.3	North Adams				
88-22.	Person designated in the North Adams plan was not effectively in charge of emergency operations at the EOC. (2.1.1.4.9.3)	4/26/88	N/A	3	3	A.1.d	North Adams				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-23. Briefings were informal and inaccurate information was given to the North Adams EOC staff members. (2.1.1.4.9.4)	4/26/88	N/A	3	3	A.1.b, A.2.a	North Adams				
88-24. There was no evidence that the North Adams EOC staff was involved in decision making. (2.1.1.4.9.5)	4/26/88	N/A	3	3	A.1.b, A.2.a	North Adams				
88-24a. No data was posted on the plume EPZ map in the Rowe EOC. (2.1.1.4.10.1)	4/26/88	N/A	4	5	H.3	Rowe				
88-25. The Savoy EOC has only one commercial telephone line available for the staff. (2.1.1.4.11.1)	4/26/88	N/A	4	4	F	Savoy				
88-26. The firemen at the Greenfield Reception Center were not sufficiently trained in decontamination procedures. (2.1.1.5.1.1)	4/29/88	2.1.5.1 (8/22/84)	25	24	J.12	Greenfield				
88-27. Only one survey instrument had audio equipment and low-level radiation survey capability at the Greenfield Reception Center. (2.1.1.5.1.2)	4/26/88	N/A	21	22	J.12	Greenfield				
88-28. Floor coverings and additional visual aids are needed to prevent the spread of contamination within the Williamstown Reception Center. (2.1.1.5.2.1)	4/26/88	N/A	6	6	J.12	Williamstown				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-29. The emergency workers performing radiation monitoring of evacuees and the operator of the CD radio at the Williamstown Reception Center were inadequately trained. (2.1.1.5.2.2)	4/26/88	4.1.1.6 (3/25/82)	21	22	J.12	Williamstown				
88-30. The decision chain in the Vermont EOC plan for authorizing emergency workers to receive radiation doses in excess of the PACs is unclear. (2.1.2.1.1)	4/26/88	4.2.1.26 (3/25/82)	3	3	K.4	Vermont				
88-31. Procedures were not evident in the Vermont EOC as to EBS message preparation, verification by EBS radio station(s), activation of tone-alert radios, and message broadcast. (2.1.2.1.2)	4/26/88	N/A	12, 13	17, 18	A.2.a, E.6	Vermont				
88-32. Discussions were not held in the Vermont EOC for conducting route alerting where siren coverage may be minimal, or notifying institutions and special population groups. (2.1.2.1.3)	4/26/88	N/A	12, 13	17, 18	E.6, F.1.b	Vermont				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-33. The State of Vermont had an inadequate supply of dosimeters available for State emergency workers. (2.1.2.1.4)	4/26/88	N/A	6	6	K.3.a	Vermont				
88-34. According to Vermont field monitoring team members, their monitoring and counting equipment is calibrated yearly; however, the instruments did not have proper calibration stickers. (2.1.2.3.1)	4/26/88	N/A	7	10	H.10	Vermont				
88-35. Vermont field monitoring team members did not understand the techniques required to minimize cross-contamination in sample counting. (2.1.2.3.2)	4/26/88	N/A	9	12	I.8	Vermont				
88-36. Vermont field monitoring teams demonstrated their ability to take air samples by closely following written procedures; however, tweezers were not available to remove and handle the particulate filter to minimize cross-contamination. (2.1.2.3.3)	4/26/88	N/A	9	12	I.8	Vermont				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-37.	The air-sampling pumps used by the Vermont field monitoring teams were inadequate. It would have taken more than four and one-half hours at the prescribed flow rate before 20 ft^3 of air would have passed through the particulate filter and silver zeolite cartridge, and radioisotopes, including radioiodines at 10^{-7} uCi/cc, could have been properly detected. (2.1.2.3.4)	4/26/88	N/A	9	12	-1.8, 1.9	Vermont				
88-38.	Telephone numbers for hospitals, local utilities, etc. were not readily available in the Halifax EOC. (2.1.2.4.1.1)	4/26/88	N/A	4	4	F	Halifax				
88-39.	The Readsboro EOC was not activated and staffed in a timely manner. The Alert notification was transmitted to the EOC at approximately 6:30 p.m. during staff involvement with a real emergency. The message was received and interpreted by the ED's wife, with the result that the EOC staff was not informed of the Alert ECL until 7:21 p.m. The EOC was then promptly activated and staffed. (2.1.2.4.2.1)	4/26/88	6/11/86	2	2	E.1, F.1.a	Readsboro		Yes (8/24/88)	All towns within the 10-mile EPZ have been issued pagers and personnel have been trained in the procedures to be followed upon receipt of a page. The pagers will be activated by the Vermont State Police.	C

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-40.	Backup emergency electrical power was unavailable at the Media Center. (2.1.3.2.1)	4/26/88	N/A	5	5	G.3.a	Massachusetts, Vermont (Media Center)				
88-41.	The Media Center did not have sufficient electrical power outlets for the electrical requirements of news media equipment (e.g., computers, typewriters, television camera lighting). (2.1.3.2.2)	4/26/88	N/A	5	5	G.3.a	Massachusetts Vermont (Media Center)				
88-42.	Only three telephone lines were available in the Media Center for reporters, which is unrealistic in view of the probable heavy demand by reporters. (2.1.3.2.3)	4/2[illegible]/88	N/A	5	5	G.3.a	Massachusetts, Vermont (Media Center)				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-43.	Although radios and a television set were available in the Media Center for monitoring the news, one AM radio did not work and the other radios and the television set were not actively monitored. (2.1.3.2.4)	4/26/88	2.6.2.1 (4/6/83)	5,3	5,3	G.4.b	Massachusetts (Media Center)				
88-44.	The Media Center staff spent virtually no time conferring in advance of each news media briefing. The result was often extemporaneous and poorly organized presentations. (2.1.3.2.5)	4/26/88	N/A	14	MA-19 VT-20	G.4.b	Massachusetts, Vermont (Media Center)				
88-45.	At Media Center briefings, the status board was not used as a public information tool to assist the reporters. The status board would have given the news media a point of reference as to current events. (2.1.3.2.6)	4/26/88	5.2 (8/22/84)	5,14	MA-5 MA-19 VT-20	G.4.b	Massachusetts, Vermont (Media Center)				
88-46.	The first State of Vermont news release at the Media Center erroneously identified the declaration of an Alert ECL as resulting from "leaking of main coolant." (2.1.3.2.7)	4/26/88	N/A	13	18, 19	G.4.b	Vermont (Media Center)				

TABLE 3: DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION
YANKEE ROWE NUCLEAR POWER PLANT

	Issue Description	Exercise Date	Previously Identified Issue	FEMA Objective	Exercise Objective	NUREG-0654 Reference	Jurisdiction	Action Taken	Objective Subsequently Tested (Exercise Date)	Corrective Action Verified (i.e., Results)	Current Status
88-47.	The State of Vermont issued news releases and EBS messages; however, they were never distributed in hard-copy form in the Media Center. (2.1.3.2.8)	4/26/88	6/11/86	14	20	G.4.b	Vermont (Media Center)				

NOTES:

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

Previously identified Issue: Deficiency or area requiring corrective action identification number and the exercise date is listed in parentheses.

FEMA Objective: From the list of FEMA's standard 36 core objectives.

Exercise Objective: From the listing 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 ACTION.

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 action as observed during the exercise.

Current Status: C = Complete
I = Incomplete

TABLE 4 STATUS OF OBJECTIVES — YANKEE ROWE NUCLEAR POWER PLANT

FEMA Core Objective	Year of Exercise	Massachusetts																Vermont											Joint State			
		State EOC	Area IV EOC	Field Teams	Laboratory	Reception Centers	Buckland	Charlemont	Clarksburg	Colrain	Florida	Hawley	Heath	Monroe	North Adams	Rowe	Savoy	State EOC	IFO	Field Teams	Laboratory	Reception Center	Halifax	Readsboro	Stamford	Whitingham	Wilmington	Media Center	EOF	New Hampshire EOC	New York EOC
1. Demonstrate ability to mobilize staff and activate facilities promptly.	1982	A	A	–	–	–	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	A	A	I	A	A	A	A	A	A	A	–	I	–	A	A	A	A	A	N	A	–	–
	1984	–	–	P	–	–	–	–	–	–	–	–	–	–	–	–	–	A	A	–	–	–	A	A	N/O	N/O	N/O	A	A	–	–
	1986	A	A	–	–	P	P	P	A	A	P	A	P	A	A	A	A	A	A	P	–	–	A	A	P	A	A	A	A	–	–
	1988	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	–	–	–	I	A	–	–	–	A	–	–
	1988R	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2. Demonstrate ability to fully staff facilities and maintain staffing around the clock.	1982	A	A	–	–	–	A	A	A	A	A	A	A	A	A	A	A	N/O	N//O	–	–	–	A	A	N/O	N/O	A	–	N/O	–	–
	1983	A	A	–	–	–	A	I	N/O	A	A	I	P	A	A	A	A	A	A	–	I	–	A	A	A	A	A	A	–	–	–
	1984	–	–	A	I	–	–	–	–	–	–	–	–	–	–	–	–	A	A	–	I	–	A	N/O	A	A	A	A	A	–	–
	1986	A	A	–	–	A	P	P	A	A	A	A	A	A	A	A	A	N	N	N	N	N	N	N	N	N	N	A	A	–	–
	1988	I	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	–	–	–	–	–	–	–	–	–	–	A	A	–	–
3. Demonstrate ability to make decisions and to coordinate emergency activities.	1982	A	A	–	–	–	A	A	A	A	A	A	A	A	A	A	A	A	N	–	–	–	A	A	A	A	A	A	–	–	–
	1983	A	A	–	–	–	A	A	A	A	A	A	A	A	A	A	A	A	–	–	–	–	A	A	A	A	A	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	A	–	–	–	A	A	A	A	A	–	A	–	–
	1986	A	A	A	–	A	P	A	A	A	A	A	A	A	A	A	A	A	P	A	–	–	A	A	A	A	A	A	A	–	–
	1988	I	A	–	A	A	A	A	A	A	A	A	A	A	I	A	A	A	A	–	–	–	–	–	–	–	–	P	I	–	–
	1988R	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4. Demonstrate adequacy of facilities and displays to support emergency operations.	1982	A	A	–	–	–	A	A	A	A	A	I	A	A	A	A	A	A*	A	–	–	–	A	A	A	A	A	A	I	–	–
	1983	A	A	–	–	–	A	A*	A	A	A	A	A	A	A	A	A	A	P	–	P	–	A	A	A	A	A	A	A	–	–
	1984	–	–	–	I	–	–	–	–	–	–	–	–	–	–	–	–	A	I	–	–	–	A	A	A	A	A	P*	I	–	–
	1986	A	A	–	–	A	P	A	A	A	A	A	A	A	A	A	A	A	A	–	–	–	A	A	A	A	A	A	A	–	–
	1988	A	A	–	A	I	A	A	I	A	I	A	A	A	I	I	A	–		A	–	–	–	–	–	–	–	I	A	–	–
5. Demonstrate ability to communicate with all appropriate locations, organizations, and field personnel.	1982	I	I	–	–	–	A	I	A	A	I	I	A	I	A	A	A	I	–	–	–	–	P	P	I	I	I	–	A	–	–
	1983	A	I	–	–	–	A	A	A	A	I	A	P	I	A	A	A	A	A	–	–	–	A	A	A	A	A	A	P	–	–
	1984	–	–	I	–	–	–	–	–	–	–	–	–	–	–	–	–	A	A	I	–	–	A*	A	I	A	I	A	A*	–	–
	1986	A	I	A	–	A	P	P	P	P	A	A	A	A	A	A	A	I	P	A	–	–	A	A	A	A	A	A	A	–	–
	1988	A	I	I	A	A	A	I	A	A	A	A	A	A	A	A	I	A	A	–	–	–	I	–	–	–	–	I	I	–	A
	1988R	–	I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6. Demonstrate ability to mobilize and deploy field monitoring teams in a timely fashion.	1982	–	–	N	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–
	1983	–	–	P	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	P	–	–	–	–	–	–	–	–	–	–	–
	1984	–	–	P	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	N	–	–	–	–	–	–	–	–	–	–	–
	1986	–	–	I	–	–	–	–	–	–	–	–	–	–	–	–	–	N	N	N	N	N	N	N	N	N	N	–	–	–	–
	1988	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	A	–	–	–	–	–	–	–	–	–	–	–
7. Demonstrate appropriate equipment and procedures for determining ambient radiation levels.	1982	–	–	N	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–
	1983	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	N/O	–	–	–	–	–	–	–	–	–	–	–
	1984	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–
	1986	–	–	P	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	P	–	–	–	–	–	–	–	–	–	–	–
	1988	–	–	I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	I	–	–	–	–	–	–	–	–	I	–	–

TABLE 4 STATUS OF OBJECTIVES -- YANKEE ROWE NUCLEAR POWER PLANT (Cont'd)

FEMA Core Objective	Year of Exercise	Massachusetts																		Vermont										Joint State		
		State EOC	Area IV EOC	Field Teams	Laboratory	Reception Centers	Buckland	Charlemont	Clarksburg	Colrain	Florida	Hawley	Heath	Monroe	North Adams	Rowe	Savoy	State EOC	IFO	Field Teams	Laboratory	Reception Center	Halifax	Readsboro	Stamford	Whitingham	Wilmington	Media Center	EOF	New Hampshire EOC	New York EOC
8. Demonstrate appropriate equipment and procedures for measurement of airborne radioiodine concentrations as low as 10^{-7} μCi/cm in the presence of noble gases.	1982	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/O	-	-	-	-	-	-	-	-	-	-	-
	1983	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/O	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-
	1986	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	N	N	N	N	N	N	-	-	-
	1988	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	-	-	-	-	-	-	-
9. Demonstrate appropriate equipment and procedures for collection, transport and analysis of samples of soil, vegetation, snow, water and milk.	1982	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	N	-	-	-	-	-	-	-	-	-	-	-
	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/O	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-
	1986	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	A	A
	1988	-	-	A	I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-
10. Demonstrate ability to project dosage to the public via plume exposure, based on plant and field data, and to determine appropriate protective measures, based on PACs, available shelter, evacuation time estimates, and all other appropriate factors.	1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	A	-	-
	1983	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	A	-	-	-	-	-	-	-	-	-	A	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	A	-	-
	1986	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	-	-	-	-	-	-	A	-	-
	1988	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-
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 PACs and other relevant factors.	1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
	1983	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
	1986	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	A	A	A
	1988	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 4 STATUS OF OBJECTIVES -- YANKEE ROWE NUCLEAR POWER PLANT (Cont'd)

FEMA Core Objective	Year of Exercise	Massachusetts																	Vermont								Joint State				
		State EOC	Area IV EOC	Field Teams	Laboratory	Reception Centers	Buckland	Charlemont	Clarksburg	Colrain	Florida	Heath	Monroe	North Adams	Rowe	Savoy	State EOC	IFO	Field Teams	Laboratory	Reception Center	Halifax	Readsboro	Stamford	Whitingham	Wilmington	Media Center	EOF	New Hampshire EOC	New York EOC
12. Demonstrate ability to implement protective actions for ingestion pathway hazards.	1982	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	–	–	–	–	–	–	–	–	–	–	–	–	–
	1983	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	–	–	–	–	–	–	–	–	–	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	–	–	–	–	–	–	–	–	–	–	–	–	–
	1986	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	M	M	–	A	A
	1988	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–
13. Demonstrate ability to alert the public within the 10-mile EPZ, and disseminate an initial instructional message, within 15 minutes.	1982	A	A	–	–	–	A	A	M	A	A	A	A	P	A	A	M	A	–	–	–	–	A	A	–	A	A	–	–	–	–
	1983	A*	–	–	–	–	–	–	–	A	–	–	–	–	I	–	–	–	A	–	–	–	P	P	A	–	–	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	A	M	–	–	–	–	–	–
	1986	A	A	–	–	–	P	A	A	A	A	–	–	A	–	A	A	A	–	–	–	–	–	A	–	A	A	–	–	–	–
	1988	I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	I	–	–	–	–	–	A	A	A	A	A	–	–	–	–
	1988R	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
14. Demonstrate ability to formulate and distribute appropriate instructions to the public, in a timely fashion.	1982	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1983	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1986	P	–	–	–	–	P	–	A	A	P	–	–	A	–	A	M	M	M	M	M	M	M	M	M	M	N	A	–	–	–
	1988	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–
15. Demonstrate the organizational ability and resources necessary to manage evacuation of all or part of the plume EPZ.	1982	M	M	–	–	–	M	A	M	M	A	M	M	M	P	A	M	A	–	–	–	M	A	A	A	A	–	–	–	–	–
	1983	–	–	–	–	–	P	P	M	P	M	M	M	A	M	A	M	–	–	–	–	M	M	M	M	M	–	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	–	–	–	–	M	M	M	M	M	–	–	–	–	–
	1986	A	A	–	–	–	P	A	A	A	A	A	P	A	A	P	M	M	M	M	M	M	M	M	M	M	–	–	–	–	–
	1988	–	–	–	–	–	A	A	A	A	A	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
16. Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, as inclement weather or traffic obstructions.	1982	A	M	–	–	–	M	M	M	M	M	M	M	M	P	A	M	–	–	–	–	M	A	M	I	M	–	–	–	–	–
	1983	A	–	–	–	–	A	M	M	M	A	M	M	M	A	A	A	–	–	–	–	M	M	M	M	M	–	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	–	–	–	–	M	M	M	M	M	–	–	–	–	–
	1986	A	A	–	–	–	P	A	A	A	A	A	–	P	A	–	M	M	M	M	M	M	M	M	M	–	–	–	–	–	–
	1988	–	–	–	–	–	A	A	A	A	A	A	A	A	A	A	A	–	–	–	–	A	–	A	–	–	–	–	–	–	–

TABLE 4 STATUS OF OBJECTIVES — YANKEE ROWE NUCLEAR POWER PLANT (Cont'd)

FEMA Core Objective	Year of Exercise	Massachusetts																		Vermont								Joint State				
		State EOC	Area IV EOC	Field Teams	Laboratory	Reception Centers	Buckland	Charlemont	Clarksburg	Colrain	Florida	Hawley	Heath	Monroe	North Adams	Rowe	Savoy	State EOC	IFO	Field Teams	Laboratory	Reception Center	Halifax	Readsboro	Stamford	Whitingham	Wilmington	Media Center	EOF	New Hampshire EOC	New York EOC
17. Demonstrate the organizational ability and resources necessary to control access to an evacuated area.	1982	A	M	–	–	–	A	M	M	M	A	M	M	M	A	A	A	A	–	–	–	–	M	A	M	M	A	–	–	–	–
	1983	A	–	–	–	–	A	A	M	A	A	M	P	A	A	A	A	M	M	M	–	–	M	M	M	M	M	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1986	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	M	M	–	–
	1988	–	–	–	–	–	A	A	A	A	A	A	A	A	A	A	A	A	–	–	–	–	A	–	A	A	–	–	–	–	–
18. Demonstrate the organizational ability and resources necessary to effect an orderly evacuation of mobility-impaired individuals within the plume EPZ.	1982	M	M	–	–	–	M	A	M	A	A	M	A	A	A	A	M	M	–	–	–	–	M	A	M	M	A	–	–	–	–
	1983	–	–	–	–	–	–	A	M	A	A	–	M	A	A	A	M	–	–	–	–	–	P	A	M	A	P	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	M	M	M	M	M	M	M	M	M	M	–	–
	1986	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	M	M	–	–	–
	1988	–	–	–	–	–	M	M	M	M	M	M	M	M	M	M	M	M	–	–	–	–	–	–	–	–	–	–	–	–	–
19. Demonstrate the organizational ability and resources necessary to effect an orderly evacuation of schools within the plume EPZ.	1982	M	–	–	–	–	M	M	M	M	M	M	M	M	M	M	M	M	–	–	–	–	M	M	M	M	M	–	–	–	–
	1983	M	M	–	–	–	M	P	M	P	M	M	M	P	P	P	M	–	–	–	–	–	M	M	M	M	M	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	M	M	M	M	M	M	M	M	M	M	–	–
	1986	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	M	M	–	–	–
	1988	–	–	–	–	–	M	M	M	M	M	M	M	M	M	M	M	M	–	–	–	–	–	–	–	–	–	–	–	–	–
20. Demonstrate ability to continuously monitor and control emergency worker exposure.	1982	M	M	–	–	–	P	P	I	A	A	I	I	I	A	A	P	M	–	–	–	–	I	A	P	I	A	–	A	–	–
	1983	I	–	–	–	–	P	A	I	A	A	P	A	A	P	A	A	–	–	–	–	–	P	A	I	I	M/O	–	–	–	–
	1984	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	M	P	–	–	P	P	P	P	P	–	A	–	–
	1986	A	A	A	–	–	A	A	A	A	A	A	A	A	A	A	A	P	A	A	–	–	A	A	A	A	A	–	–	–	–
	1988	–	–	I	–	–	A	A	A	A	A	A	A	A	I	A	A	I	–	–	–	–	–	–	–	–	–	–	–	–	–
21. Demonstrate ability to make the decision, based on predetermined criteria, whether to issue KI to emergency workers and/or the general population.	1982	M	M	–	–	–	M	M	M	M	M	M	M	M	M	M	M	M	–	–	–	–	M	M	M	M	M	–	–	–	–
	1983	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1984	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1986	A	A	–	–	–	A	A	–	A	M/O	A	A	A	M/O	A	M/O	M	M	M	M	M	M	M	M	M	M	M	–	–	–
	1988	A	–	–	–	–	A	A	–	–	–	–	–	–	–	–	–	A	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 4 STATUS OF OBJECTIVES - YANKEE ROWE NUCLEAR POWER PLANT (Cont'd)

FEMA Core Objective	Year of Exercise	Massachusetts																		Vermont									Joint State				
		State EOC	Arga IV EOC	Field Teams	Laboratory	Reception Centers	Buckland	Charlemont	Clarksburg	Colrain	Florida	Hawley	Heath	Monroe	North Adams	Rowe	Savoy	State EOC	IFO	Field Teams	Laboratory	Reception Center	Halifax	Readsboro	Stamford	Whittingham	Wilmington	Media Center	EOF	New Hampshire EOC	New York EOC
22. Demonstrate ability to supply and administer KI, once the decision has been made to do so.	1982	N	N	-	-	-	N	N	N	N	N	N	N	N	N	N	N	N	-	-	-	-	N	N	N	N	N	-	-	-	-
	1983	N	-	-	-	-	N	N	N	N	N	N	N	N	N	N	N	N	-	-	-	-	N	N	N	N	N	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	N	N	N	N	N	-	-	-	-
	1986	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	-	-
	1988	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-
23. Demonstrate ability to effect an orderly evacuation of on-site personnel.	1982	N	N	-	-	-	-	-	-	-	-	-	-	N	-	N	-	N	-	-	-	-	N	N	N	N	N	-	-	-	-
	1983	N	-	-	-	-	-	-	-	-	-	-	-	N	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	A	-	-	-	-	-	-	-	-
	1986	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	-	-
	1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24. Demonstrate ability to brief the media in a clear, accurate and timely manner.	1982	A	-	-	-	-	N	N	N	N	N	N	N	N	N	N	N	-	-	-	-	-	-	-	-	-	-	A	-	-	-
	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-
	1986	A	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-
	1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-
25. Demonstrate ability to provide advance coordination of information released.	1982	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-
	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-
	1986	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	I	-	-	-
	1988	I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	I	-	-	-
26. Demonstrate ability to establish and operate rumor control in a coordinated fashion.	1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
	1983	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1986	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	N	N	N	N	N	A	-	-	-
	1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	A	-	-	-
27. Demonstrate adequacy of procedures for registration and radiological monitoring of evacuees.	1982	-	-	-	-	I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-
	1983	-		-	-	I	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
	1986	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	N	N	N	N	N	-	-	-	-
	1988	-	-		-	I	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	N	N	N	N	N	-	-	N	N
28. Demonstrate adequacy of facilities for mass care of evacuees.	?	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N/O	-	-	-	-	-	-	-	-	-
		-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	-	-
	1988	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-

TABLE 4 STATUS OF OBJECTIVES -- YANKEE ROWE NUCLEAR POWER PLANT (Cont'd)

FEMA Core Objective	Year of Exercise	Massachusetts																	Vermont									Joint State				
		State EOC	Area IV EOC	Field Teams	Laboratory	Reception Centers	Buckland	Charlemont	Clarksburg	Colrain	Florida	Hawley	Heath	Monroe	North Adams	Rowe	Savoy	State EOC	IFO	Field Teams	Laboratory	Reception Center	Halifax	Readsboro	Stamford	Whitingham	Wilmington	Rutland Center	EOF	New Hampshire EOC	New York EOC
29. Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment, and vehicles.	1982	-	-	-	-	-	M	M	M	M	M	M	M	M	M	M	M	M	-	-	-	-	M	M	M	M	M	-	A	-	-
	1983	M	M	-	-	-	M	M	M	M	M	M	M	M	M	M	M	M	-	-	-	-	M	M	M	M	M	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1986	-	-	-	-	I	-	-	-	-	-	-	-	-	-	-	-	M	M	M	M	M	M	M	M	M	M	-	-	-	-
	1988	-	-	-	-	A	-	-	A	-	-	-	-	-	-	-	-	M	M	M	M	M	M	M	M	M	M	-	-	-	-
30. Demonstrate adequacy of ambulance facilities and procedures for handling contaminated individuals.	1982	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1983	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1986	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	M	M	M	-	-
	1988	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	M	-	-	M	M
31. Demonstrate adequacy of hospital facilities and procedures for handling contaminated individuals.	1982	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1986	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	M	M	M	-	-
	1988	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	M	-	-	M	M
32. Demonstrate ability to identify need for, request and obtain Federal assistance.	1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	M	-	-
	1986	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	M	M	M	-	-
	1988	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-
33. Demonstrate ability to relocate to and operate the alternate EOF/EOC.	1982	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	1983	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	A	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	M	-	-
	1986	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	M	M	M	-	-
	1988	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	M	M	M	M	M	M	M	M	M	M	M	M	M	M
34. Demonstrate ability to estimate total population exposure.	1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-
	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	M	-	-
	1986	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	M	M	M	-	-
	1988	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 4 STATUS OF OBJECTIVES -- YANKEE ROWE NUCLEAR POWER PLANT (Cont'd)

FEMA Core Objective	Year of Exercise	Massachusetts																			Vermont									Joint State			
		State EOC	Area IV EOC	Field Teams	Laboratory	Reception Centers	Buckland	Charlemont	Clarksburg	Colrain	Florida	Hawley	Heath	Monroe	North Adams	Rowe	Savoy	State EOC	IFO	Field Teams	Laboratory	Reception Center	Halifax	Readsboro	Stamford	Whitingham	Wilmington	Media Center	EOF	New Hampshire EOC	New York EOC
35. Demonstrate ability to determine and implement appropriate measures for controlled recovery and reentry.	1982	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	A	-	-
	1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	N	N	-	-	-	-	-	-	-	-	P	-	-
	1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	N	N	-	-	-	-	-	-	-	-	A*	-	-
	1986	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	1988	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Legend:

C = Corrective Action Identified
N = Not an exercise objective
A = Objective fully demonstrated (Adequate)
P = Objective partially demonstrated

N/O = Not Observed by FEMA
I = Objective not fully demonstrated (Inadequate)
- = Not Applicable
R = Remedial Exercise