

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
METROPOLITAN EDISON COMPANY ET AL.)
(Three Mile Island Nuclear Station,)
Unit 1))

Docket No. 50-289
(Restart)

NRC STAFF PROPOSED FINDINGS OF FACT
AND CONCLUSIONS OF LAW
REGARDING EMERGENCY PLANNING

Joseph R. Gray
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 12th day of August, 1981.

DS07
5
1/1

TABLE OF CONTENTS

Page

I. INTRODUCTION

A. Witness Testimony and Exhibits 1

B. Organization of Findings

 1. Rulings on and Organization of Intervenor Contentions 10

 2. Commission Short and Long Term Order Items and Staff SER 13

 3. NRC's New Emergency Planning Rules 14

 (a) Evaluation of Licensee's Revised Emergency Plan - NUREG-0746 15

 (b) FEMA's Findings and Determinations 16

C. Standards for Emergency Planning

 1. New Emergency Planning Rules 18

 2. Intervenor Contentions on Standards 20

II. FINDINGS OF FACT ON ADMITTED CONTENTIONS

A. Organization and Staffing of Emergency Response Organizations

 1. Licensee's Emergency Response Organization 22

 2. Local Emergency Response Organizations 35

 (a) Staffing of Local Emergency Coordinators 36

 (b) Functions and Qualifications of Local Emergency Personnel 38

 3. Availability of Emergency Workers 40

 4. NRC's Emergency Response Organization 43

	<u>Page</u>
B. <u>Accident Assessment and Dose Projection</u>	44
1. Accident Classification	45
2. Radiation Monitoring	53
(a) Mobile Monitoring Teams	53
(b) Offsite Remote Readout Monitors	58
(c) Analysis Capability	62
(d) Licensee's Radiological Environmental Monitoring Program	66
C. <u>Initial Notification of Governmental Units</u>	69
1. Sequence of Calls	69
2. Information Transmitted	72
D. <u>Public Education, Warning and Emergency Instructions</u>	75
1. Public Education	76
2. Warning	84
3. Emergency Instructions to the Public	
(a) Concept of Operations	95
(b) Emergency Broadcast System (EBS)	100
(c) 911 Telephone System	101
(d) News Releases	105
E. <u>Definition of EPZs</u>	107
F. <u>Protective Action Decisionmaking</u>	115
1. General Criteria	116
2. Evacuation Time Estimates	127
3. Consideration of Contingencies	136
4. Ingestion PAGs	143

	<u>Page</u>
G. <u>Implementation of Protective Actions</u>	151
1. Unmet Needs and Letters of Agreement	161
2. Communications	169
3. Chain of Command	180
4. Police, Fire and National Guard Support	185
5. Wrecking and Fuel Service Support	193
6. Transportation - General	196
7. Transportation of School Children	204
(a) League of Women Voters' Testimony	204
(b) Contentions	209
8. Individuals Without Private Transportation	211
9. Transportation and Care for Invalids and Homebounds	216
10. Post-Evacuation Support	224
11. Medical Facilities and Decontamination	231
12. Distribution and Administration of Potassium Iodide (KI)	239
13. Farmers and Livestock	248
14. Coordination	257
H. <u>Maintaining Emergency Preparedness</u>	260
1. Training	260
2. Exercises and Drills	264
3. Audit and Review of Plans	273
I. <u>Funding for Emergency Response</u>	275

	<u>Page</u>
III. FINDINGS OF FACT ON COMPLIANCE WITH THE COMMISSION'S <u>SHORT AND LONG TERM ORDER ITEMS AND ON THE OVERALL</u> <u>ADEQUACY OF EMERGENCY PREPAREDNESS FOR TMI-1</u>	277
IV. <u>CONCLUSIONS OF LAW</u>	290

TABLE OF CONTENTIONS

<u>CONTENTION</u>	<u>PAGE</u>	<u>CONTENTION</u>	<u>PAGE</u>
EP-1	72, 98	EP-10	232
EP-2	248	EP-11	143
EP-3(A)	20	EP-12	105
3(B)	21	EP-13	224
3(C)(1)	58	EP-14(A)	89
3(C)(2)	62	14(B)	92, 209
EP-4(A)	248	14(C)	83, 97, 178
4(B)	167		193, 218, 245
4(C)	77		270
4(D)	32	14(D)	170
4(E)	74	14(E)	178
4(F)	264	14(F)	38
4(G)	69	14(G)	38
4(H)	116	14(H)	177
4(I)	53	14(I)	216
4(J)	25	14(J)	188
EP-5(A)	244	14(K)	235
5(B)	124	14(L)	190
5(C)	40	14(M)	246
5(D)	87	14(N)	170
5(E)	119	14(O)	89
5(F)	260	14(P)	101, 176
5(G)	252	14(Q)	80
5(H)	263	14(R)	181
EP-6(A)	231	14(S)	191, 235
6(B)	193	14(T)	89
6(C)	169	14(U)	138
6(D)	163	14(V)	196
6(E)	246	14(W)	161
6(F)	216	14(X)	185
6(G)	256	14(Y)	95
EP-7	46	14(Z)	238
EP-8	48	14(AA)	199
EP-9	51	14(BB)	254
		14(CC)	195
		14(DD)	135
		14(EE)	225

<u>CONTENTION</u>	<u>PAGE</u>	<u>CONTENTION</u>	<u>PAGE</u>
EP-14(F)	100	EP-18	56, 66
14(G)	275	Board Questions	
14(H)	134	4(a)	59
14(I)	229	4(b)	62
14(J)	233		
14(K)	132		
14(L)	36		
14(M)	134		
14(N)	136		
14(O)	186		
EP-15(E)	257		
EP-16(A)	227		
16(B)	36		
16(C)	172		
16(D)	178		
16(E)	91		
16(F)	174		
16(G)	211		
16(H)	214		
16(I)	183		
16(J)	210		
16(K)	222		
16(L)	224		
16(M)	92, 94		
16(N)	140		
16(O)	221		
16(P)	135		
16(Q)	103		
16(R)	213		
16(S)	228		
16(T)	202		
EP-17(A)	108, 110, 112, 114		
17(B)	273		

1. "Licensee's Testimony of Robert E. Rogan, George J. Giangli, and Alexis Tsaggaris on the Adequacy of Onsite Emergency Preparedness at Three Mile Island Unit 1" (Rogan et al., ff. Tr. 13756);
 2. "Licensee's Testimony of William E. Riethle in Response to Contention Nos. EP-3(c)(1) and EP-18 and Board Question 4 (Offsite Radiological Monitoring)" (Riethle, ff. Tr. 14842);
 3. "Licensee's Testimony of Russell R. Dynes on the Principles of Planning for Emergencies" (Dynes, ff. Tr. 17120);
 4. "Licensee's Testimony of Bruce E. Podwal, Albert E. Schaufler, and Robert E. Rogan on Evacuation Time Estimates for the Plume Exposure Pathway Emergency Planning Zone at Three Mile Island" (Podwal et al., ff. Tr. 17410);
 5. "Licensee's Testimony of Milton Levenson on Realistic Estimates of the Consequences of Nuclear Accidents for Use in Emergency Planning" (Levenson, ff. Tr. 19525); and
 6. "Licensee's Testimony of Eugene F. Knopf, William Gallagher and Oran Henderson Relating to Emergency Planning" (Knopf et al., ff. Tr. 21816).
3. The direct testimony offered by the intervenors and received in evidence is as follows:
1. "Aamodt Testimony to Support Aamodt Contention 4" (Aamodt, ff. Tr. 14517);
 2. "Direct Testimony of Dr. Jan Beyea on behalf of the Anti-Nuclear Group Representing York Regarding A.N.G.R.Y. Contention No. III (B)(D)" (Beyea, ff. Tr. 18350);
 3. "Testimony of Paul M. Lytle, Jr., Jeremiah K. Fisher and Vance Fisher in Support of Aamodt Contention EP-2" (Lytle et al., ff. Tr. 18749);
 4. "Testimony of Dr. Robert Weber in Support of Aamodt Contention EP-2" (Weber, ff. Tr. 18799);
 5. "Testimony of Bruce Molholt, Ph.D, in Support of Off-site Contentions of the Environmental Coalition on Nuclear Power (EP-7 (ECNP 2-8), EP-10 (ECNP 2-28), EP-11 (ECNP 2-33))" (Molholt, ff. Tr. 19690);
 6. "Intervenor Aamodt's Testimony of County Agricultural Agents Harold E. Stewart of Dauphin County and John T. Smith of York

County Regarding Contention EP-1" (Stewart and Smith, ff. Tr. 20243);

7. "Testimony on Behalf of the Anti-Nuclear Group Representing York on Municipal and School Emergency Planning in York, and York County Emergency Response to Three Mile Island" (Ryscavage et al., ff. Tr. 21508);
8. "Testimony of Kai T. Erikson on Emergency Planning for the Three Mile Island Area Communities in Rebuttal to the Testimony of Dr. Dynes" (on behalf of ANGRY) (Erikson, ff. Tr. 21686);
and
9. "Testimony of Donald Zeigler on Emergency Planning for the Three Mile Island Area Communities on Behalf of the Anti-Nuclear Group Representing York" (Zeigler, ff. Tr. 21818).

In addition, Mrs. Aamodt called Dr. Lawrence Samples who testified on her behalf beginning at Tr. 18775. He did not submit pre-filed direct testimony.

4. The Commonwealth of Pennsylvania, which is participating as an interested state under 10 CFR § 2.715(c), called numerous witnesses to testify on its behalf. The direct testimony filed by the Commonwealth is as follows:

1. "Commonwealth of Pennsylvania's Testimony of General DeWitt C. Smith and James N. Lothrop Outlining the Commonwealth's Approach to Testimony" (Smith and Lothrop, ff. Tr. 17698);
2. "Commonwealth of Pennsylvania's Testimony of Kenneth R. Lamison Pertaining to Warning (Contentions EP-5(d) and EP-15(f))" (Lamison (Warning), ff. Tr. 17818);
3. "Commonwealth of Pennsylvania's Testimony of Kenneth R. Lamison Pertaining to Exercises and Drills (Contentions EP-4(f), EP-5(d))" (Lamison (Exercises and Drills), ff. Tr. 17818);
4. "Commonwealth of Pennsylvania's Testimony of Kenneth R. Lamison Pertaining to Training (Contention EP-5(f))" (Lamison (Training), ff. Tr. 17818);
5. "Commonwealth of Pennsylvania's Testimony of Kenneth R. Lamison Pertaining to Command and Control (Contentions EP-5(c), EP-6(b), EP-14(c), EP-14(h), EP-14(j), EP-14(r), and EP-14(x))" (Lamison (Command and Control), ff. Tr. 17818);

6. "Commonwealth of Pennsylvania's Testimony of James N. Lothrop Pertaining to Evacuation (Contentions EP-13, EP-14(kk), EP-14(nn), EP-16(a), EP-16(n), EP-16(p))" (Lothrop, ff. Tr. 17996);
7. "Commonwealth of Pennsylvania's Testimony of John J. Comey Pertaining to Public Information (Contention EP-XII)" (Comey, ff. Tr. 18038);
8. "Commonwealth of Pennsylvania Staff Testimony of Margaret A. Reilly in Response to Contentions EP-5B, EP-11, EP-18C, EP-18E (Emergency Planning-Bureau of Radiation Protection)" (Reilly, ff. Tr. 18125);
9. "Commonwealth of Pennsylvania Testimony of Dr. Max A. Van Buskirk, Jr. and Dr. John W. Cable Regarding Contentions EP-2, EP-4(a) and EP-5(g) (Livestock Evacuation)" (Van Buskirk and Cable, ff. Tr. 18296);
10. "Commonwealth of Pennsylvania's Testimony of Julia Cox Pertaining to Thyroid Blocking Agent Distribution (Contentions EP-5(a), EP-6(e), EP-10)" (Cox, ff. Tr. 18497);
11. "Testimony on ECNP Contention 2-33 (EP-11) by George K. Tokuhata, Dr.P.H., Ph.D." (on behalf of Commonwealth) (Tokuhata, ff. Tr. 20097) and Additional Tokuhata Data in Form of Table and Map (Tokuhata Data, ff. Tr. 20106);
12. "Commonwealth of Pennsylvania's Testimony of Leroy C. Corbin, Jr. Regarding Contention EP-18(E) (Contaminated Foodstuffs)" (Corbin, ff. Tr. 20286); and
13. "Joint Testimony of Adolph L. Belser (PEMA), Randy L. Curry (York County) and Michael E. Wertz (Dauphin County) Pertaining to York and Dauphin County Emergency Planning (Contentions EP-6, EP-14 and EP-16)" (Curry et al., ff. Tr. 20787).

In addition, Robert C. Furrer (Tr. 18832), George Fouse (Tr. 20396) Ralph J. Hippert (Tr. 22873), and William P. Dornsife (Tr. 23011) testified on behalf of the Commonwealth. They did not submit pre-filed direct testimony.

5. The Staff's testimony on emergency planning is as follows:
 1. "NRC Staff Testimony of Stephen H. Chesnut on Contentions Related to Onsite Emergency Planning and the Licensee's Emergency Plan" (Chesnut, ff. Tr. 15007);

2. "NRC Staff Testimony of Joseph R. Levine on Contentions Related to Onsite Emergency Planning" (Levine, ff. Tr. 17298);
3. "NRC Staff Testimony of Dale E. Donaldson on Emergency Planning Contentions" (Donaldson, ff. Tr. 17354);
4. "Testimony of Frederick J. Bath and Vernon E. Adler of the Federal Emergency Management Agency on Certain Offsite Emergency Planning Contentions" (Adler and Bath (2/23 Testimony), ff. Tr. 18975);
5. "Testimony of FEMA's Vernon E. Adler and Frederick J. Bath on Contentions Related to Offsite Emergency Preparedness" (Adler and Bath (3/16 Testimony), ff. Tr. 18975);
6. "Testimony of Thomas Urbanik on Evacuation Time Estimate Study for Three Mile Island" (Urbanik, ff. Tr. 19137);
7. "Joint Testimony of NRC Staff's Stephen Chesnut and FEMA's Frederick J. Bath on Contentions Related to Onsite/Offsite Emergency Preparedness" (Chesnut and Bath, ff. Tr. 19626);
8. "NRC Staff Testimony of Harold T. Peterson, Jr. on ECNP Contention 2-33 (EP-11)" (Peterson, ff. Tr. 20500);
9. "NRC Staff Testimony of Stephen H. Chesnut on Unresolved Onsite Emergency Response Matters from the February 9, 1981 NRC Staff Testimony of Dale E. Donaldson on Contentions EP-40 and EP-18" (Chesnut (Unresolved Matters), ff. Tr. 22205); and
10. "NRC Staff Testimony of Dale Donaldson and Stephen Chesnut on Licensee's Response in June 2, 1981 Exercise and NRC Staff's Exercise Report" (Donaldson and Chesnut, ff. Tr. 22236).

6. In addition to the direct testimony filed, the parties submitted various exhibits in the emergency planning phase of this proceeding. The following Board exhibits related to emergency preparedness were introduced and received in evidence:

Board Ex. 3 - "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," NUREG-0654, Appendix 5 (Tr. 4463);

Board Ex. 5 - Draft, "York County Radiological Emergency Response Plan for Incidents at the Three Mile Island Nuclear Power Station," April 14, 1981 (Tr. 20790);

Board Ex. 6 - Draft, "Dauphin County Radiological Emergency Response Plan for Incidents at the Three Mile Island Nuclear Power Station," April 17, 1981 (Tr. 20791);

Board Ex. 7 - "Cumberland County Radiological Emergency Response Plan," April 28, 1981 (Tr. 21813);

Board Ex. 8 - "Lancaster County Radiological Emergency Response Plan," March 20, 1981 (Tr. 21813);

Board Ex. 9 - "Lebanon County Radiological Emergency Response Plan," April 21, 1981 (Tr. 21813);

Board Ex. 11 - FEMA Proposed Rule, 44 CFR 350, 45 Fed. Reg. 42341, June 24, 1980 (Tr. 22639);

Board Ex. 12 - FEMA/NRC Memorandum of Understanding (Tr. 22643); and

Board Ex. 13 - Municipal Emergency Plans (Tr. 22996).

The Board also had five maps prepared which visually describe the area around the Three Mile Island site. These maps were identified as:

Board Physical Ex. A - Three Mile Island Nuclear Power Station, Middletown, PA; 50-Mile Radius Area Population Density Map; 1977 Estimate, by Census County Subdivision. July 1980, U.S. Geological Survey (Tr. 19373);

Board Physical Ex. B - Land Use and Land Cover Map, Harrisburg, PA. 1972, U.S. Geological Survey (Tr. 19373);

Board Physical Ex. C - Computer Plotted Map of Land Use and Land Cover, Three Mile Island and Vicinity, with Census Tracts. U.S. Geological Survey (Tr. 19373);

Board Physical Ex. D - Three Mile Island Nuclear Power Station, Middletown, PA; 20-Mile Radius Population Density Map; 1977 Estimate by Census County Subdivision. July 1980, U.S. Geological Survey (Tr. 19373); and

Board Physical Ex. E - Three Mile Island Nuclear Power Station, Middletown, PA; 10-Mile Radius Area. July 1980, U.S. Geological Survey (Tr. 19373).

7. The following Licensee exhibits relating to emergency planning were introduced and received in evidence:

Licensee Ex. 30 - "GPU Nuclear Emergency Plan for TMI-1," Revision 3, January 1981 (Tr. 13759);

Licensee Ex. 31 - "Three Mile Island Nuclear Station, Unit No. 1, Administrative Procedure 1053, Emergency Equipment Readiness, Revision 0," January 7, 1981 (Tr. 14839);

Licensee Ex. 52 - "Evacuation Time Estimates for the Plume Exposure Pathway EPZ of Three Mile Island Nuclear Generating Facility," 3/3/81 (Tr. 17408);

Licensee Ex. 58 - Letter dated July 8, 1981 to J. Gray, NRC, from R. E. Zahler, re Licensee's commitment on staffing of EOF (Tr. 22934); and

Licensee Ex. 59 - Letter dated July 7, 1981 to R. Adler, Commonwealth, from E. L. Blake, re Licensee commitments on management (operational staffing) (Tr. 23003).

8. The intervenors also introduced certain documents for identification.

Only one of the documents pertaining to emergency planning was admitted into evidence: ANGRY Ex. 3 - Map of school districts in EPZ (Tr. 21669).

9. The Commonwealth of Pennsylvania introduced several emergency planning documents which were later received into evidence. These are:

Commonwealth Ex. 1 - Pages 59 through 67, "Three Mile Island, A Report to the Commissioners and to the Public", NRC Special Inquiry Group, Mitchell Rogovin, Director (Tr. 16200);

Commonwealth Ex. 2.A - Commonwealth of Pennsylvania Disaster Operations Plan, Annex E, Fixed Nuclear Facility Incidents, dated February 23, 1981 (Tr. 17815);

Revised Appendix 7 to the Commonwealth of Pennsylvania Disaster Operation Plan, Annex E, Fixed Nuclear Facility Incidents, dated February 23, 1981 (Tr. 20400);

Commonwealth Ex. 2.B - Map, excerpt of the Commonwealth of Pennsylvania Disaster Operations Plan, Annex E, Fixed Nuclear Facility Incidents, dated February 23, 1981 (Tr. 17815);

Commonwealth Ex. 3 - Commonwealth of Pennsylvania brochure entitled "Emergency Information: What You Should Know About Nuclear Radiation Incidents", issued 11/79 (Tr. 18208);

Commonwealth Ex. 4 - Lancaster County brochure entitled "Emergency Information for Lancaster County" (Tr. 18208);

Commonwealth Ex. 5 - York County brochure entitled "Emergency Information for York County" (Tr. 18208);

Commonwealth Ex. 6 - Commonwealth's TMI Fault Tree Procedures (Tr. 18912); and

Commonwealth Ex. 7 - Dauphin County brochure entitled "Emergency Information for Dauphin County" (Tr. 19683).

10. The Staff's exhibits on emergency planning which were received in evidence are as follows:

Staff Ex. 1 - NUREG-0680, "TMI-1 Restart Evaluation of Licensee's Compliance with the Short and Long Term Items of Section II of NRC Order Dated August 9, 1979, Metropolitan Edison Company, et al., Three Mile Island Nuclear Station Unit 1, Docket No. 50-289" (Tr. 20122);

Staff Ex. 4 - NUREG-0680, Supplement No. 1 (Tr. 11941);

Staff Ex. 6 - NUREG-0746, "Emergency Preparedness Evaluation for TMI-1" (Tr. 15009);

Staff Ex. 7 - NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants", Revision 1 (Tr. 15010);

Staff Ex. 8 - NUREG-0696, "Functional Criteria for Emergency Response Facilities" with attached letter dated March 5, 1981 from Darrell G. Eisenhut to all licensees of operating plants and holders of construction permits (Generic Letter No. 17) (Tr. 15433);

Staff Ex. 10 - NUREG-0728, "Report to Congress: NRC Incident Response Plan," September 1980 (Tr. 16110);

Staff Ex. 14 - NUREG-0680, Supplement 3 (Tr. 20122);

Staff Ex. 17 - Affidavit of Stephen Chesnut on Closeout Inspection on 30 Health Physics-Emergency Planning Significant Findings from Inspection 50-289/80-22, on Licensee's Shift Manning Using One Licensed Senior Reactor Operator Rather Than Two and on Containment High Range Monitors for Emergency Response (Tr. 22234);

Staff Ex. 18 - Memorandum dated June 16, 1981 to B. K. Grimes, NRC, from R. T. Jaske, FEMA, containing "[FEMA] Interim Findings and Determinations Relating to the Status of State and Local Emergency Preparedness around Three Mile Island (TMI) Fixed Nuclear Facility" (Tr. 22512);

Staff Ex. 19 - "FEMA Responses to Licensing Board Questions on Extent to Which Panic and Psychological Stress Were Factored into NUREG-0654/FEMA-REP-1, on Data on Persons Who Panic in Disaster Situations, and on Documentation Available to FEMA on Extent to Which Evacuees Respond to Instructions Perceived to be Contrary to Their Best Interests" (Tr. 22513);

Staff Ex. 20 - Attachment 1 to FEMA's Interim Findings and Determinations of June 16, 1981: Pennsylvania REP Exercise Site - Specific to TMI - Observations and Recommendations (Tr. 22514);

Staff Ex. 21 - Attachment 2 to FEMA's Interim Findings and Determinations of June 16, 1981: Update of May 14, 1981 "Review of Pennsylvania Planning Site - Specific to TMI" (Tr. 22515);

Staff Ex. 22 - Brief Summary of the [FEMA] Guidance Memorandum Series for Use as an Index, dated December 15, 1980 (Tr. 22593); and

Staff Ex. 23 - NUREG-0746, Supplement No. 1 (Tr. 22879).

11. Other documentary evidence pertaining to emergency planning which was incorporated into the record is as follows:

1. Professional Qualifications, Brian K. Grimes (ff. Tr. 15007, 15855);
2. Resolution No. OR-9-171, dated July 16, 1979, "Organization Chart for PEMA" (PEMA Organization Chart, ff. Tr. 18286);
3. Department of Health, Education and Welfare, Food and Drug Administration, "Notice Requesting Submissions of New Drug Applications for Potassium Iodide as a Thyroid-Blocking Agent for Use in a Radiation Emergency," 43 FED. REG. 58798 (1978) (Tr. 18577);
4. Department of Health, Education and Welfare, Food and Drug Administration, "Notice Approving Two New Drug Applications for Potassium Iodide as a Thyroid-Blocking Agent for Use in a Radiation Emergency," 45 FED. REG. 11912 (1980) (Tr. 18577);
5. Professional Qualifications, Robert C. Furrer (ff. Tr. 18836);
6. Organization Chart of the Pennsylvania Department of Agriculture (ff. Tr. 18836);
7. Professional Qualifications, Michael S. Pawlowski (ff. Tr. 18928);
8. Memorandum dated March 26, 1981 from Samuel J. Chilk, U.S. Nuclear Regulatory Commission to William J. Dircks, U.S. Nuclear Regulatory Commission, regarding SECY-80-257/257A - Radiation Protection - Thyroid Blocking (Tr. 20394);
9. Letter dated March 25, 1981 from Joseph M. Hendrie, Chairman, U.S. Nuclear Regulatory Commission, to Louis Guiffrida, Director, Federal Emergency Management Agency (Tr. 20394);

10. Letter dated March 25, 1981 from Joseph M. Hendrie, Chairman, Nuclear Regulatory Commission, to Dr. Mark Novich, Acting Commissioner of Food and Drugs, Food and Drug Administration (Tr. 20394);
11. Professional Qualifications, George W. Fouse (ff. Tr. 20397);
12. Official Notice of Calculations Performed by Dr. Walter H. Jordan on Dose to Thyroid (5/15 ASLB Memo. and Order, ff. Tr. 21304);
13. Attachment 3 to FEMA's Interim Findings and Determinations of June 16, 1981: Changes in Preparedness on Issues before the Board - Unresolved Matter Based on Filed Testimony of FEMA's Bath/Adler and FEMA's Bath/NRC Chesnut (Bath (Attachment 3), ff. Tr. 22350);
14. Stipulation of a chronology of events regarding advisories to the public during the TMI-2 accident (Tr. 22501);
15. Professional Qualifications, Robert T. Jaske (ff. Tr. 22508);
16. Professional Qualifications, John E. Dickey (ff. Tr. 22508);
17. Professional Qualifications, Thomas E. Hardy (ff. Tr. 22508);
18. Professional Qualifications, Bruce J. Swiren (ff. Tr. 22508);
19. NRC Staff Position on Emergency Preparedness for TMI-1 (ff. Tr. 22881);
20. Official Notice of Pennsylvania Statute, Title 635, Part 5, Chapters 71, 73, 75, 77 (Tr. 22958); and
21. Professional Qualifications, William P. Dornsife (ff. Tr. 23011).

B. Organization of Findings

1. Rulings On and Organization Of Intervenor Contentions
12. The Licensing Board in this proceeding admitted numerous intervenor contentions on the emergency planning issue. The intervenors who submitted such contentions were: Mrs. Aamodt, Anti-Nuclear Group Representing York (ANGRY), Environmental Coalition on Nuclear Power (ECNP), Newberry Township TMI Steering Committee, and Mr. Sholly.

13. Although the Board admitted certain emergency planning contentions in its December 18, 1979 "First Special Prehearing Conference Order", various Intervenors rephrased and expanded their contentions on this issue throughout the pre-hearing phase. Other intervenors withdrew their contentions entirely. In an attempt to clarify the issues to the satisfaction of all the parties, several meetings were held between the Staff, the Licensee, the Commonwealth of Pennsylvania, and the Intervenors concerned with emergency planning. See generally, "Memorandum and Order Scheduling Emergency Planning Session," dated October 17, 1980; "Memorandum and Order on Emergency Planning Meeting," dated November 14, 1980; and "Memorandum and Order," dated November 25, 1980. Subsequently, on December 23, 1980, Mr. Sholly asked to withdraw his two contentions on emergency planning (Sholly Contentions 8 and 9). ANGRY moved to adopt them. Tr. 9995-97. The Board granted ANGRY's motion with respect to Contention 9 on radiation monitoring and Contention 8I(B) and 8I(I); ANGRY was not permitted to adopt the other portions of Sholly Contention 8. Tr. 11023-24. ANGRY requested reconsideration of the Board's denial on February 6, 1981. Although it again refused ANGRY permission to adopt portions of Sholly Contention 8, the Board ruled that "we will not sustain an objection to testimony. . . on the grounds of being beyond the scope of existing contentions, if it can be justified as being within the scope of the withdrawn Sholly contentions." "Memorandum and Order on ANGRY's Request for Reconsideration of its Motion to Adopt Several of Mr. Sholly's Emergency Planning Contentions," dated February 25, 1981, at 2.

14. The admitted contentions overall are directed to nearly all aspects of radiological emergency planning and response. Specific contentions are directed to the Licensee's planning and response capabilities while most of the contentions are directed to specific details of State planning and response and the planning and emergency response capabilities of certain counties and municipalities within those counties. Issues raised in a number of major areas of radiological emergency planning and response overlap with other areas making organization of findings difficult at best. Moreover, a number of contentions raised multiple issues in disparate areas of emergency planning and response, requiring that such contentions be divided into parts to be addressed in different portions of these findings.
15. In addition, the Board, on its own motion, posed two questions related to emergency planning which dealt with offsite radiation monitoring. Findings on these Board Questions, as well as on the more than 100 emergency planning contentions admitted in this proceeding, are set forth in Section II, infra. Findings on the contentions and Board Questions are organized in the major emergency planning and response categories of: Organization and Staffing of Emergency Response Organizations; Accident Assessment and Dose Projection; Initial Notification of Governmental Units; Public Education, Warning and Emergency Instructions; Definition of EPZs; Protective Action Decisionmaking; Implementation of

Protective Actions; Maintaining Emergency Preparedness; and Funding for Emergency Response.^{1/}

2. Commission Short and Long Term Order Items and Staff SER

16. In its August 9, 1979 Order, the Commission set forth two items dealing with emergency planning. Short-term Order Item 3 states:

The licensee shall improve his emergency preparedness in accordance with the following:

- (a) Upgrade emergency plans to satisfy Regulatory Guide 1.101 with special attention to action level criteria based on plant parameters.
- (b) Establish an Emergency Operations Center for Federal, State, and Local Officials and designate a location and an alternate location and provide communications to the plant.
- (c) Upgrade offsite monitoring capability, including additional thermo-luminescent dosimeters or equivalent.
- (d) Assess the relationship of State/Local plans to the licensee plans so as to assure the capability to take emergency actions.
- (e) Conduct a test exercise of its emergency plan.

^{1/} At the request of the Board (Tr. 5113-14), the Licensee renumbered all of the emergency planning contentions which were admitted as of November 18, 1980 and moved that the Board adopt the numbering system proposed. (Licensee's Motion to Renumber Emergency Planning Contentions," dated January 30, 1981.) The Licensee's Motion was never officially granted but all the parties to the proceeding used the numbering scheme set forth in that Motion and the Licensee's numbering system will be used in these findings.

CLI-79-8, 10 NRC 141,144 (1979). Long-term Order Item 4 requires the Licensee to improve emergency preparedness in accordance with the following:

- (a) modify emergency plans to address changing capabilities of plant instrumentation,
- (b) extend the capability to take appropriate emergency actions for the population around the site to a distance of ten miles.

Id. at 145. Under the Commission's Order, Licensee is not required to resolve these long-term concerns prior to restart, although they "must be satisfactorily addressed in a timely manner." Id.

17. The Staff addressed the short and long term Order items and the Licensee's compliance with those items in its "Evaluation of Licensee's Compliance with the Short- and Long-Term Items of Section II of the NRC Order Dated August 9, 1979" (NUREG-0680). That document, and its supplements, were introduced as exhibits in this proceeding. Our findings with regard to compliance with the short and long-term Order items related to emergency preparedness are set forth in Section III, infra.

3. NRC's New Emergency Planning Rules

18. Approximately one year after the issuance of the Commission's Order and Notice of Hearing in this proceeding, the Commission published a new final rule on emergency planning (45 FED. REG. 55402, August 19, 1980), which became effective on November 3, 1980. The new rule substantially modified, expanded and upgraded the NRC's emergency

planning regulations, requiring the submission of revised emergency plans complying with upgraded requirements and standards and extending emergency planning considerations to "Emergency Planning Zones." 45 FED. REG. 55402. Under the new emergency planning rules, licensees authorized to possess and/or operate a nuclear power reactor are to follow and maintain in effect emergency plans which meet the 16 planning standards set forth in 10 CFR §50.47(b) and the requirements of 10 CFR Part 50, Appendix E. 10 CFR §50.54(q).

19. Also under the new rules the revised licensee, State and local emergency plans were to be implemented by April 1, 1981, after which the NRC will determine whether the state of emergency preparedness provides reasonable assurance that appropriate protective measures can and will be taken in the event of a radiological emergency. 10 CFR §50.54(s)(2). The NRC will base its findings in this regard on a review of the Federal Emergency Management Agency's (FEMA) "findings and determinations" as to whether State and local emergency plans are adequate and capable of being implemented and on the NRC's assessment as to whether the licensee's emergency plans are adequate and capable of being implemented. 10 CFR §50.54(s)(3).

(a.) Evaluation of Licensee's Revised Emergency Plan - NUREG-0746

20. The NRC Staff's assessment of the Licensee's compliance with the planning standards of 10 CFR §50.47(b) and with the requirements of Appendix E to 10 CFR Part 50 is set forth in the Staff's "Emergency Preparedness Evaluation for TMI-1," NUREG-0746, issued on December 10, 1980 (Staff Ex. 6) and in Supplement 1 to NUREG-0746, issued on May

29, 1981 (Staff Ex. 23). Both of these documents were admitted into evidence in the proceeding. The Staff's assessment of the Licensee's emergency preparedness is discussed in Section III, infra.

(b.) FEMA's Findings and Determinations

21. Pursuant to a presidential decision of December 7, 1979, FEMA is to assume lead responsibility for all offsite nuclear emergency planning and response. Consistent with this, the NRC's new emergency planning rules provide that the NRC's determination as to whether there is reasonable assurance that appropriate protective measures can and will be taken in the event of a radiological emergency is to be based, in part, on FEMA's "findings and determinations" as to whether State and local emergency plans are adequate and capable of being implemented.
22. On June 24, 1980, FEMA published proposed rules (44 CFR Part 350) establishing the formal FEMA process for evaluation and approval of State and local emergency plans. 45 FED. REG. 42341 (1980). The process established under the proposed rules requires a number of steps initiated by a State which submits the final State-approved State and local emergency plans for FEMA review. From this review, FEMA issues final findings and determinations culminating in formal approval or disapproval of State and local plans. See 10 CFR §§350.7-350.12 at 45 FED. REG. 42345-46 (1980).
23. Apart from FEMA's review process under its proposed rules, formal interim FEMA findings and determinations on the adequacy of State and local emergency plans may be obtained for use in the NRC's licensing process under a "Memorandum of Understanding Between NRC and FEMA Relating to Radiological Emergency Planning and Preparedness" (MOU)

entered on November 4, 1980. 45 FED. REG. 82713.^{2/} Board Ex. 12. Pursuant to this MOU, FEMA has provided interim findings and determinations to NRC for at least nine facilities, three of which were granted NRC operating licenses. Tr. 22528 (Dickey). Also pursuant to this MOU, the NRC Staff requested that FEMA provide its findings and determinations on the adequacy of State and local emergency preparedness for TMI.

24. Based on its review and evaluation of the latest revised versions of the Commonwealth's Emergency Plan and the Emergency Plans of Cumberland, Dauphin, Lancaster, Lebanon and York counties which surround TMI, and on observations and evaluations of the performance of the State and four of the five counties in a radiological emergency response exercise held on June 2, 1981, FEMA produced its findings and determinations for TMI on June 16, 1981. Those findings and determinations, which were entered into evidence and supported by the Acting Director of FEMA's Office of Population Preparedness and a panel of FEMA witnesses, are discussed in Section III, infra.

^{2/} The MOU provides that:

[n]otwithstanding the procedures which may be set forth in 44 CFR 350 for requesting and reaching a FEMA administrative approval of State and local plans, findings and determinations on the current status of emergency preparedness around particular sites may be requested by the NRC through the NRC/FEMA Steering Committee and provided by FEMA for use as needed in the NRC licensing process. These findings and determinations may be based upon plans currently available to FEMA or furnished to FEMA by the NRC. 45 FED. REG. 82714, §11.4.

C. Standards for Emergency Planning

1. New Emergency Planning Rules

25. The NRC's new emergency rules engendered discussions in this proceeding about the effect of the rules on the litigation of emergency planning issues as contemplated by the Commission's Notice of Hearing.^{3/} On February 9, 1981, the Board requested all parties and Commonwealth agencies with an interest in emergency planning to submit briefs stating their respective views on the short-term and long-term requirements for offsite emergency planning and the applicability of the new emergency planning rules. Some of the parties briefed the questions posed. The briefs were supplemented by a Joint Statement, dated March 6, 1981, noting areas of agreement by the Licensee, the Staff and the Commonwealth; by a March 11, 1981 combined statement of Intervenor ECNP, Newberry, TMIA and the Aamodt Family; by a March 12, 1981 reply brief by the Commonwealth; and finally by extensive oral discussion on March 17, 1981 (Tr. 15334-72).
26. The passage of time and the interaction of the parties in discussions and filings have served to minimize any remaining disagreements on the effect of the new rule. After reviewing the filings of the parties and considering the extensive oral argument, we determined that it is necessary that emergency plans and preparedness for TMI comply with the substantive standards and requirements of the

^{3/} We held a prehearing conference to elicit the parties' views on this and related matters on October 30 and November 1, 1980. Additional discussion took place during various hearing sessions on emergency planning.

new emergency planning regulations prior to restart.^{4/} A requirement to comply with the new rules would include the weighing and balancing provisions of the rules (10 CFR §§50.54(s)(2), 50.47(c)(1)) applicable to determining whether any deficiencies are of such a nature as to not preclude restart pending their cure.^{5/}

27. Thus, we will look to the new emergency planning rules for the substantive standards and requirements for emergency preparedness that must be met prior to restart.^{6/} Consistent with the new rules, we will also look to NUREG-0654/FEMA-REP-1, Revision 1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (hereafter NUREG-0654), for the criteria and guidelines on how the standards and requirements of the new rules may be met.^{7/}

^{4/} Our determinations in this regard were memorialized in a "Memorandum and Order on Effect of New Emergency Planning Regulations" issued on March 23, 1981 (Standards Memorandum and Order).

^{5/} Standards Memorandum and Order, at 4. Of course, the weighing and balancing provisions of the new rules may only be relied upon to allow operation in the face of deficiencies if the record provides a basis for such action.

^{6/} This does not mean that all procedural mechanisms of the new rule, designed for general use, are properly applicable to this case. In a particular factual situation, it may be that the general provision of the regulation is in fatal conflict with the specific controlling law of the case derived from the Commission's August 9, 1979 Order and Notice of Hearing. Standards Memorandum and Order, at 4.

^{7/} NUREG-0654, while setting forth criteria and guidelines as to the manner in which the new emergency planning rules may be met, does not have the force and effect of a regulation. Thus the parties were not precluded from attempting to show that compliance with NUREG-0654 is not necessary or sufficient. Standards Memorandum and Order, at 5-6.

28. Finally, we have examined the role of FEMA findings and determinations in this proceeding. The language of the new emergency planning rules directs that the "...NRC... base its findings on a review of the FEMA findings and determinations as to whether State and local emergency plans are adequate and capable of being implemented" 10 CFR §§50.54(s)(3), 50.47(a)(2). This makes such FEMA findings and determinations a mandatory prerequisite to determining compliance with the new rules.^{8/}

2. Intervenor Contentions on Standards

29. Two contentions raised by Intervenor ANGRY (Contentions EP-3(A) and EP-3(B)) challenge the conditions for restart set forth in the Commission's August 9, 1979 Order on the grounds that there are no standards for judging the adequacy of emergency plans. Specifically, it is asserted that:

The conditions set forth in NRC's August 9 Order (44 F.R. 47821-25) for TMI-1's resumption of operation are insufficient to provide reasonable assurance that such resumption can occur without endangering the public health and safety for the reason that they fail to require the development and effectuation of adequate and effective Radiological Emergency Response Plans to protect the population surrounding TMI-1 from the consequences of any future nuclear accident. Such insufficiency is in particular demonstrated by the following flaws:

EP-3(A) There is no requirement that restart be conditioned on the Radiological Emergency Response Plan of the Commonwealth of Pennsylvania being brought into compliance with reasonable standards of adequacy and effectiveness for such plans which include but are not limited to standards promulgated by the NRC itself (e.g., NUREGS 75/111 and 0396; GAO EMD-78-110; H.R. Rept. 96-413);

^{8/} Standards Memorandum and Order, at 8.

EP-3(B) There is no requirement that restart be conditioned on the Radiological Emergency Response Plans of local governmental units (counties) surrounding the reactor site being brought into compliance with reasonable standards of adequacy and effectiveness for such plans which include but are not limited to standards promulgated by the NRC itself. (See Paragraph (A)).

30. As we have just discussed, we have determined that the emergency preparedness and plans for TMI-1 must comply with the substantive standards and requirements of the new emergency planning regulations prior to restart. As set forth in the new rules themselves, criteria and guidelines as to how the new rules may be met are set forth in rather explicit detail in NUREG-0654, which specifically designates those criteria applicable to the plans and preparedness of the State and the counties. Accordingly, we find that there are specific applicable standards and criteria, promulgated by the NRC itself, for determining the adequacy of State and county emergency plans and preparedness and we reject the assertions to the contrary in Contentions EP-3(A) and EP-3(B).

II. FINDINGS OF FACT ON ADMITTED CONTENTIONS

A. Organization and Staffing of Emergency Response Organizations

1. Licensee's Emergency Response Organization

31. The Licensee's overall emergency response organization consists of both an onsite organization and an offsite emergency support organization. Rogan et al., ff. Tr. 13756, Figures 1 and 2. With regard to the onsite organization, the shift supervisor is responsible for assessing an incident, determining necessary immediate actions and classifying the emergency. Upon declaration of an emergency, the shift supervisor becomes the Emergency Director who has the authority to immediately and unilaterally initiate emergency actions and make protective action recommendations. If the shift supervisor is unavailable or incapacitated, the shift foreman serves as Emergency Director. Rogan et al., ff. Tr. 13756, at 17, 26-27. The Licensee's onshift complement consists of 20 personnel (Rogan et al., ff. Tr. 13756, Table 2; Tr. 14591 (Giangi); Tr. 14433-34 (Chesnut)) with major functional responsibilities vested in the Emergency Director, the Operations Coordinator, the Operations Support Center Coordinator, the Radiological Assessment Coordinator, the Technical Support Center Coordinator and the Security Coordinator. Rogan et al., ff. Tr. 13756, at 26. The onshift staffing exceeds the staffing standards set forth in NUREG-0654 (Staff Ex. 7), Table B-1 (Chesnut, ff. Tr. 15007, at 19-20) and assures that adequate staffing in the key areas

for initial onsite response will be maintained at all times. Staff Ex. 6, at 5; Tr. 22258 (Chesnut); Tr. 22291-92 (Chesnut); Tr. 15518 (Grimes); Tr. 16058 (Chesnut).

32. Within one hour of declaration of an emergency, the shift supervisor or shift foreman is relieved as Emergency Director by the Vice President TMI-1, the Licensee's Director of Operations and Maintenance or the Radiological Controls Manager. Tr. 13882 (Giangi). The Licensee has also developed a three section Duty Roster, with one section always on call to assure that all positions in the emergency organization are fully staffed with personnel assigned based on the selection criteria set forth in the Licensee's Emergency Plan, training, and driving distance from TMI. Rogan et al., ff. Tr. 13756, at 30-31, 37; Tr. 15438 (Chesnut). The duty roster personnel are on call and, in an emergency, would be called up to report to the site within one hour in order to relieve and augment Licensee's onshift complement. Tr. 14270-72 (Giangi); Tr. 14323 (Rogan)
33. The offsite emergency support organization includes the Emergency Support Director, Emergency Support Staff, Public Affairs Representative, Emergency Planning Representative, Group Leader Administrative Support, Environmental Assessment Coordinator, Group Leader Radiological Controls Support, Group Leader Chemistry Support, Group Leader Technical Support, Maintenance and Construction Manager, and Emergency Support

Communicator. This offsite emergency support organization provides technical and logistics support in the event of a serious or potentially serious emergency. Rogan et al., ff. Tr. 13756, at 33. This organization, when called up, can be fully manned and functional within six hours of declaration of an emergency (Tr. 14348 (Giangi)), although Licensee has committed to have certain components of the organization arrive earlier and to activate certain offsite emergency response facilities within four hours. Licensee Ex. 58.^{9/}

34. The NRC Staff has evaluated the Licensee's Emergency Response Organization as provided for in the Licensee's Emergency Plan and has determined that primary responsibilities for emergency response by the Licensee have been assigned and that the Licensee's principal response organization has the staff to respond and augment response on a continuous basis, as specified in the planning standard for "Assignment of Responsibility," 10 CFR § 50.47(b)(1). Staff Ex. 6, at 2. There is no evidence to the contrary in this regard and we find that the Licensee's emergency organization does, in fact, comply with this planning standard.

^{9/} As discussed in Paragraphs 40 and 41, infra, the Staff and the Commonwealth of Pennsylvania believe the EOF should be fully operational within one hour. Although we adopt that position, this does not detract from our finding that the Licensee's emergency organization does comply with 10 CFR § 50.47(b)(1).

35. Two contentions were admitted which directly challenge the adequacy of the Licensee's emergency organization and staffing. One of those contentions, EP-4(J), states:

The licensee's Onsite Emergency Organization staffing provisions as set forth in Table 8 of its EP fail to conform to the standards of N. 0654 Sec. 85 in the following respects:

1. Under said standards two control room operators are assigned the function of "plant operations and assessment of operational aspects." Another shift employee is given the exclusive task of providing communications liaison with offsite officials. Under the licensee's staffing provisions, by contrast, the two control room operators are assigned to "operate equipment in control room and act as communicator" (emphasis added). This divided responsibility compromises the licensee's ability to provide prompt offsite notification of emergency conditions. The inadequacy of these staffing provisions is aggravated by the absence of any provision for the addition of three more persons with communications responsibilities within 30 minutes, as required by the aforementioned acceptability standard.
2. A similar confusion of assignments exists with regard to the shift supervisor and shift foreman, who are expected to fill three roles between them.
3. Although N. 0654 requires the emergency operations facility director to assume his assignment within 30 minutes, under the licensee's plan this will not occur for as long as four hours.
4. Two radiological analysis support engineers, who are the only employees identified as having the training and primary responsibility for performing "dose projection calculations and source term calculations" (EP, p. 5-10) will not be available for as long as 60 minutes.

36. As to the first part of this contention, the assignment of two reactor operators to operate equipment and act as communicators does not compromise the ability to provide prompt offsite notification because the Licensee's onshift complement far exceeds the provisions of Table 8-1 of NUREG-0654 which

stipulates an onshift staffing of 10 personnel. Thus, the Licensee has extra personnel beyond the needed minimum staffing who may be assigned communications duties as needed. Chesnut, ff. Tr. 15007, at 19-20. Two reactor operators may be assigned to operational duties and a third operator may be assigned to notification duties. Rogan et al., ff. Tr. 13756, at 31 and Table 2. Under the Licensee's Emergency Plan provisions, the onshift staff will be augmented within one hour by a communicator and two communications assistants. Rogan et al., ff. Tr. 13756, at 94. Through this provision, Licensee's augmentation of staffing exceeds the guidance set forth in NUREG-0654, Table B-1 specifying the addition of two communications personnel within one hour. Chesnut, ff. Tr. 15007, at 21. The Licensee's onshift manning assures that the NUREG-0654 guidance to have one additional communicator within 30 minutes can be met immediately from the Licensee's onshift staffing. Id.

37. Part 2 of contention EP-4(J) asserts that, in an emergency, the shift supervisor and shift foreman are to assume three emergency response roles. While it was true under previous versions of the Licensee's Emergency Plan that these two personnel were to function as Emergency Director, Radiological Assessment Coordinator and Operations Coordinator until the onsite emergency organization was augmented within one hour by the duty section (Chesnut, ff. Tr. 15007, at 22-23), this is not the case under the Licensee's revised Emergency Plan (Licensee

Ex. 30). Tr. 22336 (Donaldson). Rather, under current provisions of the Licensee's Emergency Plan, the onshift Health Physics Supervisor assumes the role of the Radiological Assessment Coordinator. Tr. 22334-35 (Chesnut). Thus, the radiological assessment function is performed by the onshift Health Physics Supervisor who has four health physics technicians to assist him until the duty section personnel arrive within one hour. Tr. 22338-39 (Donaldson). In view of this, three functions are not, in fact, assigned to only two personnel and Contention EP-4(J)(2) is without merit.

38. Contention EP-4(J)(3) asserts that the Licensee's Emergency Plan is deficient because it does not provide for the manning of the Emergency Operations Facility (EOF) within the time period specified in NUREG-0654. This is a matter of some dispute among the parties.
39. The Licensee has committed to modify its Emergency Plan to provide for the activation of the EOF within one hour of declaration of a site area emergency with a senior corporate manager arriving at the EOF and assuming responsibilities as the Emergency Support Director within four hours of declaration of a site area emergency. Licensee Ex. 58, at 2. According to the Staff, under NUREG-0654 (Staff Ex. 7) radiological assessment is to be performed and protective action recommendations are to be made by a senior manager acting as the EOF Director (Emergency Support Director under Licensee's nomenclature) who should be available within one hour rather

than four. Chesnut, ff. Tr. 15007, at 23-24. Thus, the Licensee's EOF manning is, in the Staff's view, contrary to criteria in both NUREG-0654 and NUREG-0696, "Functional Criteria for Emergency Response Facilities." Staff Ex. 23, at p. II-14; Tr. 23070-71 (Chesnut).

40. Licensee argues that, in fact, the radiological assessment and protective action recommendation functions that the Staff wants transferred to an Emergency Support Director at the EOF within one hour are fully and adequately performed by the Emergency Director in the Control Room until the Emergency Support Director assumes those functions some four hours after declaration of a site area emergency. Tr. 13763-65 (Giangi). The Staff acknowledges that the Licensee does indeed provide for the radiological assessment function under its Emergency Plan (Chesnut, ff. Tr. 15007, at 24) but argues that it is important to transfer the radiological assessment and protective action recommendation function to a senior Licensee manager in the EOF early in the course of an incident so as to relieve the inplant Emergency Director of that responsibility and allow him to concentrate on plant operational matters and mitigation of the accident. Tr. 15026, 15521 (Grimes); Tr. 22945-46, 22971 (Chesnut). In the Staff's view, it is necessary to avoid performing too many functions in the control room (Tr. 15035-36 (Grimes)) which can tend to complicate the response in the control room (Tr. 22934 (Chesnut)).

41. Although the Commonwealth initially perceived no problems with the Licensee's provisions for activating and manning the EOF (Tr. 18239 (Reilly)), it now believes that the EOF should be functional with the Emergency Support Director assuming responsibility for providing protective action recommendations within one hour. Tr. 23013-15, 23053-55 (Dornsife). The basis for the Commonwealth's change of position is that it now intends to send its nuclear engineer to the EOF as early as possible for face to face contact with the Emergency Support Director. Tr. 23016 (Dornsife). Based on drills and exercises, it is the Commonwealth's view that such face to face contact is very important to the State's understanding of the protective action recommendations being made by the Licensee. Id.; Tr. 23053-55 (Dornsife). Licensee acknowledges that such face to face contact would minimize problems involving the communication of protective action recommendations to the State but believes there are other solutions to such communications problems (Tr. 23089 (Rogan)) although Licensee has not defined those solutions or sought to undertake them.
42. Licensee desires to have only what it considers to be the most qualified person available make the protective action recommendations. Tr. 23096-97 (Rogan). Consequently, in the Licensee's view, to provide an Emergency Support Director with protective action recommendation authority in the EOF within one hour, Licensee will be forced to either transfer the Emergency Director, the most qualified individual available, from the control room to the EOF or provide an Emergency Support Director

who is not the most qualified person available. Tr. 23091-92, 23096-97 (Rogan). At the same time, Licensee represents that there is no manpower resource limitation and that it does have the local corporate management who could serve as the Emergency Support Director in the time period espoused by the Staff and the Commonwealth. Tr. 22986 (Zahler).

43. While we are loathe to overrule the personnel management judgment of the Licensee, it is clear that the Licensee has available to it qualified individuals who could act as Emergency Support Director in the EOF in the interim three hour period prior to the arrival of the Offsite Emergency Support Organization without the need to transfer the Emergency Director from the control room to the EOF. In view of this, we see no bar in this regard to staffing the EOF with a qualified Emergency Support Director within one hour. On the other hand, we believe the proper and accurate communication of protective action recommendations to the Commonwealth in the early stages of an emergency to be extremely important. From the testimony of the Commonwealth's own nuclear engineer who would be intimately involved in receiving, and ascertaining the bases for, those protective action recommendations, we find that early communication of the protective action recommendations would be significantly enhanced by the early EOF manning sought by the Staff and the Commonwealth. Beyond this, transfer of the radiological assessment and protective action recommendation functions to the EOF in

the very early stages of an emergency would tend to lessen the responsibilities of the Emergency Director and his staff in the control room, allowing them to concentrate on the inplant operational and accident mitigation aspects of the emergency. On balance, the Board concludes that within one hour of declaration of a site area or general emergency, the EOF should be manned and functional with an Emergency Support Director as the sole spokesman for the Licensee for protective action recommendations.

44. In Contention EP-4(J)(4), it is asserted that the only personnel identified in the Licensee's Emergency Plan as having primary responsibility for performing dose projection and source term calculations will not be available for as long as 60 minutes. Contrary to this assertion, the Licensee's Emergency Plan provides that offsite dose assessment is to be performed initially by the onshift Health Physics Supervisor assisted by onshift health physics technicians. Tr. 22334-35 (Chesnut); Tr. 22338 (Donaldson); Rogan et al., ff. Tr. 13756, at 32. These personnel are immediately available on shift and are qualified to do dose projection and source term calculations. Chesnut, ff. Tr. 15007, at 24-25. This staffing exceeds the guidance of NUREG-0654, Table B-1 which specifies that one senior health physics person should be available within 30 minutes to perform offsite dose assessment. Id. Licensee's provisions for augmenting its offsite dose assessment staffing by providing an additional Radiological Assessment Coordinator

and radiological analysis support engineers within one hour meet the criteria of NUREG-0654. Id. Accordingly, we find Contention C-4(J)(4) to be without merit.

45. The other contention directly related to Licensee's Emergency Organization, Contention EP-4(D), states:

The licensee's "Onsite Emergency Organization" (Sec. 4.5.1.3) contains insufficient personnel and expertise in the area of Health Physics to discharge adequately the responsibilities of dose assessment and projection in the event of a rapidly developing accident sequence. The time required for the mobilization of offsite health physics support (2-4 hours - see Table 8), which is given responsibility for "overall assessment of the impact of liquid and gaseous effluents with respect to... protective action guides" (p. 5-12), is inconsistent with adequate radiological assessment capability.

Under the Licensee's onsite emergency organization, the persons responsible for dose assessment and projection are the Shift Supervisor, the Radiological Controls Foreman and three Radiological Controls Technicians, all of whom are onshift. Chesnut (Unresolved Matters), ff. Tr. 22235, at 3. The Shift Supervisor will not perform dose assessment or projection calculations himself but will have overall responsibility for this function (Chesnut (Unresolved Matters), ff. Tr. 22235, at 3) and will be provided specialized training in dose assessment and projection. Id. at 5. Upon declaration of an emergency, the Radiological Controls Foreman will assume the role of the Radiological Assessment Coordinator who has primary responsibility for doing the dose assessment and projection calculations. Id. at 3-4. For this purpose,

he will be given specialized training in radiological and environmental assessment and dose projection techniques and procedures. Id. at 5. The Radiological Controls Technicians, who will assist the Radiological Controls Foreman on dose assessment and projection calculations (Id. at 3-4), also are given specialized training in this area. Id. at 5-6.

46. Within 30 to 60 minutes of an emergency declaration, the onshift personnel described above will be relieved by a replacement Radiological Assessment Coordinator who will do dose assessment and projection and by two Radiological Analysis Support Engineers who will assist in the calculations. Chesnut (Unresolved Matters), ff. Tr. 22235, at 4-5. Each of these personnel will receive specialized training in radiological and environmental assessment and dose projection techniques and procedures. Id. at 5.
47. The evidence shows that the Licensee's Emergency Plan and Emergency Plan Implementing Procedures describe an adequate assignment of personnel trained in dose assessment and health physics to perform the dose assessment and projection required in an emergency and that this capability will be maintained by the ongoing training program of the Licensee. Chesnut (Unresolved Matters), ff. Tr. 22235, at 6-7. The Licensee's capability in this regard was confirmed in the June 2, 1981 exercise wherein the Licensee demonstrated an adequate capability to assess and project doses onsite and offsite

based on inplant parameters and meteorology. Id. at 7.

Thus, we find that the Licensee's Onsite Emergency Organization contains sufficient numbers of personnel with adequate expertise in the area of health physics to adequately perform dose assessment and projection functions in an accident, including, in view of the Licensee's onshift staffing, a rapidly developing accident.

48. The time required to mobilize offsite health physics support should not have an adverse impact on the Licensee's radiological assessment capability because the initial assessment is performed by onshift personnel based on installed effluent monitors and meteorological data. With the Licensee's technique, dose projection can be performed in minutes. Monitoring teams provide confirmatory readings. Both the initial dose projections and the confirmatory monitoring can be performed by the onshift organization with the offsite health physics personnel simply providing backup support. The uncontroverted evidence shows that the onshift organization is fully capable of performing the radiological assessment function for periods in excess of the time it will take to augment the onshift staffing. Donaldson, ff. Tr. 17354,

at 6-8. Accordingly, we find Contention EP-4(D) to be without merit.^{10/}

2. Local Emergency Response Organizations

49. A number of issues have been raised with regard to local (other than Licensee) emergency response organizations. Specifically, these issues deal with the staffing of local

^{10/} In this same area of health physics, the Licensing Board inquired as to the status of 30 significant findings on health physics emergency planning matters from a health physics appraisal conducted by the NRC's Office of Inspection and Enforcement on July 28 through August 8, 1981. The significant findings dealt with inadequacies in such matters as the assignment of individuals to functional areas of emergency activities and the emergency duty roster, emergency activity training, communications for environmental monitoring teams, audibility of the reactor building alarm, procedures for in-plant radiological surveys, procedures and equipment for monitoring and sampling radioactive effluents during emergencies and for environmental monitoring and contamination surveys and the like. See Staff Ex. 4, App. B, at 25-28. Based on responses and commitments by the Licensee and a special inspection conducted on May 4-7, 1981, the Staff presented evidence demonstrating that 26 of 30 significant findings have been satisfactorily resolved. Staff Ex. 17, at 6 and Attachment. The four items that are unresolved involve completion of one training cycle, completion of proposed modifications that, once implemented, will satisfactorily upgrade the reactor building alarm, installation of monitoring equipment for high range noble gas and radioiodine analyses, and the completion of procedures for collecting and analyzing absorbent media for radioiodine in gaseous effluents under accident conditions. Staff Ex. 17, at 6-7. The Office of Inspection and Enforcement will verify that one training cycle has been completed prior to restart. Tr. 22319 (Donaldson). Upgrading of the reactor building alarm is scheduled for completion in July 1981. Staff Ex. 17, at 6. The Licensee has committed to install the high range monitoring equipment prior to restart (Staff Ex. 17, Attachment, at 27; Tr. 22270-71 (Donaldson, Chesnut)) and resolution of this matter, as well as the development of the required procedures, is progressing in accordance with the commitment of the Licensee. Tr. 22321 (Donaldson). We find that these 30 significant findings on health physics emergency planning matters have been or will, prior to restart, be satisfactorily resolved.

emergency coordinators and with the functions and qualifications of local emergency personnel.

(a) Staffing of Local Emergency Coordinators

50. Contention EP-16(B), directed to Dauphin County, one of the five counties within the plume exposure pathway emergency planning zone (EPZ) for TMI, asserts, in part, that:

Appendix 2 of Annex E of the Dauphin County Plan lists Dauphin County Local Emergency Preparedness Directors and Coordinators; however, those coordinators do not list any substitutes in the event of an emergency. If these individuals cannot be reached at the telephone numbers listed, it would lead to confusion within their particular areas of responsibility. Therefore, until and unless substitutes are listed as local emergency coordinators, it is Intervenor's position that the Plan is deficient.

Similarly, Contention EP-14(LL), directed to York County, another county within the plume EPZ, states:

The York County Plan contains a thin staffing of all emergency coordinators and does not list any substitutes in the event that an emergency coordinator is ill, on vacation or otherwise indisposed. Without substitutes or standby emergency coordinators, the Plan is defective.

Initially, it is noted that both the Dauphin County Emergency Plan (Board Ex. 6 at Appendix 1, Annex A, at A-2) and the York County Emergency Plan (Board Ex. 5 at 14) do, in fact, list substitute or deputy county emergency management coordinators. Tr. 19445 (Bath). Addresses and home phone numbers for the substitute county coordinators are maintained and kept current at the county emergency operations centers (EOCs). Board Ex. 6, at A-2; Board Ex. 5, at 24. Thus,

substitute county emergency management coordinators are not at issue here.

51. Prior to the latest revision of the county plans, the Federal Emergency Management Agency (FEMA) had expressed a concern about the need for backup emergency management coordinators. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 49. That FEMA concern was directed to coordinators at municipal levels or levels below the county level (Tr. 19444-45 (Adler); Tr. 22408 (Bath)) and was a concern that the notification list in the county plans specified only one point of contact for municipalities. Tr. 19445 (Bath). County plans, since revised, now provide sufficient alternate methods and contacts that municipal contact and coordination is not dependent solely on the municipal emergency management coordinators. Bath (Attachment 3), ff. Tr. 22350, at 7. Thus, for York County, many municipalities have backup coordinators. For those that do not, phone numbers for elected officials, who may adequately serve as backup coordinators (Tr. 22408 (Bath)) and for the municipal emergency service organizations which could locate the elected officials, are maintained in the York County EOC. Tr. 20818-19 (Curry). By this means, contact can be made through the municipal emergency service organization as well as to the municipal emergency management coordinator. Bath (Attachment 3), ff. Tr. 22350, at 7. Similarly, while the Dauphin County Emergency Plan does not list substitute emergency management coordinators, elected municipal officials, who are qualified as substitute

municipal coordinators (Tr. 20945 (Wertz)), will be contacted through contact phone numbers maintained at the Dauphin County EOC. Curry et al., ff. Tr. 20787, Wertz Testimony at 1.

52. Based on the evidence reviewed above, we find that viable mechanisms for municipal contact in the event of an emergency exist and can be utilized to reach substitute emergency management coordinators or their functional equivalent at the municipal level, despite the fact that the Dauphin and York County Emergency Plans do not explicitly list substitute municipal coordinators. Beyond this, local fire and police organizations have representation at the county EOCs and municipal resources and emergency response can be coordinated through such representatives even in the absence of the local coordinator. Tr. 19446-48 (Batn). For these reasons, we find Contentions EP-16(B)(in part) and EP-14(LL) to be without merit.

(b) Functions and Qualifications of Local Emergency Personnel

53. Contentions EP-14(F) and EP-14(G), directed to the York County Emergency Plan, assert:

14(F). Appendix 2, Section I, Subsection B of the York County Plan provides that the Emergency Management Coordinator will insure that briefings are presented to the Commissioner and he will interpret displays and technical reports for the Commissioners. There is no statement in the Plan that the person occupying the position of Emergency Management Coordinator will have educational requirements sufficient to insure that he will be able to interpret any displays of technical reports for the Commissioners. It is Intervenor's contention that unless the Emergency Management Coordinator is required to have an expertise in the area of nuclear science, he will be unable to sufficiently and

accurately interpret the displays and technical reports for the Commissioners and thus may leave the Commissioners who ultimately are responsible for the safety and welfare of the people of York County uninformed or misinformed of actual events taking place at TMI.

14(G). Appendix 2, Section II, of the York County Plan provides that the Situation Analysis Group will receive reports of plant safety degradation, potential/actual radioactive release and radiation intensity. Again, there are no job requirements for persons who sit on a Situation Analysis Group to qualify them to make such reviews and, therefore, again, without qualified people to sit on such a group, their advice to the county's commissioners may be misinformed and unenlightened which could again then lead to chaos and confusion.

NUREG-0654 stipulates that an adequate radiological assessment capability is to exist offsite. Staff Ex. 7, at 58, Criterion I.8. That guidance also provides that the offsite radiological assessment function may be fulfilled either by state or local emergency response organizations, as appropriate. Staff Ex. 7, at 58, Criterion I.8.; Adler and Bath (2/23 Testimony), ff. 18975, at 14. For Pennsylvania, technical support and radiological assessment is provided by the Bureau of Radiation Protection (BRP) and BRP, in coordination with the Pennsylvania Emergency Management Agency (PEMA), provides technical guidance and assistance to counties and municipalities on radiation detection, hazards of radiation exposure, decontamination and protective actions. Commonwealth Ex. 2A, at 15; Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 14-15. Consequently, technical radiological assessment capability is not needed at the county level and York County need not have that capability. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 14-15.

54. Moreover, PEMA is preparing a training program for county emergency management coordinators to assure that accurate assessment information and protective action recommendations may be communicated to the counties without the need for technical background at the county level. Since BRP will perform the technical radiological assessment function, highly specialized training is not needed for York County's emergency management coordinator or staff and training as nuclear scientists and nuclear science capability is not required at the county level. Adler and Bath (2, 23 Testimony), ff. Tr. 18975, at 15-16. In turn, we find Contentions EP-14(F) and EP-14(G) to be without merit.

3. Availability of Emergency Workers

55. A consistent assertion of those Intervenor's involved in the emergency planning portion of the proceeding has been that volunteer emergency workers may not perform their assigned functions in an emergency due to concern about the safety of their own families. This assertion is embodied in Contention EP-5(C) which states:

In order to assure proper execution by emergency response personnel of duties assigned to them the Commonwealth should adopt and apply to all levels of the emergency response network the principle that such personnel should "not have more important commitments to families within the immediate area of TMI" (Dept. of Health Plan, App. I, p. 5).

56. Intervenor's presented a sociologist, Dr. Kai Erikson, who testified as to his opinion that large numbers of emergency workers would be initially unavailable in a serious emergency,

regardless of their prior commitments, because of a concern for the well-being of their families. Erikson, ff. Tr. 21686, at 6-7. Dr. Erikson further expressed his view that it is unwise to base emergency plans on the assumption that emergency workers, particularly women who have children and who would be bus drivers in an emergency, will stay at their posts and do an effective job when they are uninformed about the safety of their own children. Dr. Erikson did admit that emergency workers who are police and military personnel will likely remain on duty no matter what the circumstance because that is how they are trained to deal with emergencies. Erikson, ff. Tr. 21686, at 7-8. He further acknowledged that emergency workers need not physically meet with their families to assure family safety but could check on the status of their families by telephone or radio contact or through colleagues. Tr. 21770-71 (Erikson).^{11/}

57. Dr. Erikson also indicated that his view as to an emergency worker's initial response in looking after the safety of his own family first would apply to any emergency, not just a nuclear emergency and that he had no reason to believe that the initial response in this regard to a nuclear emergency

^{11/} In this regard, emergency service workers in general may have contingency arrangements for their families formulated in advance of an emergency. Tr. 20876 (Curry). The need for such preplanning has been identified to emergency service workers in York County, for example. Tr. 20876-77 (Curry).

would be any different than initial emergency worker response in other emergencies. Tr. 21783-84 (Erikson). With regard to other disasters or emergencies, there were no instances or studies of disasters of which Dr. Erikson was aware in which there was a shortage of persons responding to the disaster. Tr. 21764-66 (Erikson).

58. Witnesses for FEMA testified that, based on previous disaster experience, FEMA is of the view that emergency workers will perform their emergency functions in situations where their families may be at risk. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 52. FEMA studies show that emergency workers respond to their assignments regardless of personal demands (Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 52) and its experience is that persons assigned emergency missions carry out their missions. Tr. 19213 (Pawlowski). The Pennsylvania Emergency Management Agency's (PEMA) experience from previous emergencies is that volunteer and professional emergency workers have been available to work and that persons down to the county and municipal levels are very dedicated in this regard. Tr. 17828 (Lamison). PEMA has not experienced, in previous emergencies in the State (including hazardous spill emergencies), a problem with emergency workers not performing their functions. Tr. 17867-68 (Lamison). Specifically for the TMI-2 accident, volunteer workers at the State level were available for emergency work and the PEMA witness was not

aware of any large numbers of volunteer workers not being available at the local level. Tr. 17829 (Lamison).^{12/}

59. There is, then, a large body of applicable experience which demonstrates that lack of availability of emergency workers because of workers' concern for the safety of their families should not be a significant problem. Dr. Erikson himself was unable to identify any experience to the contrary. From the evidence of record, there is no basis to warrant the Commonwealth's adopting and applying "to all levels of the emergency response network the principle that such [emergency response] personnel should not have more important commitments to families within the immediate area of TMI" as advocated in Contention EP-5(C). Accordingly we reject this contention.

4. NRC's Emergency Response Organization

60. During the course of the proceeding, the Commonwealth raised a concern about the adequacy of the NRC's response in a radiological emergency. To address this matter, the Staff presented witnesses and documentary evidence to describe the NRC's Incident Response Plan (Staff Ex. 10: NUREG-0728,

^{12/} The experience of FEMA and PEMA with regard to emergency worker response is wholly consistent with the testimony of Dr. Dynes, a sociologist who testified on behalf of the Licensee. Dr. Dynes indicated that from extensive experience from a number of disasters throughout the country, emergency workers with families in the risk area have carried out their emergency responsibilities and that there were no instances of emergency operation failures due to emergency workers not carrying out their responsibilities. Tr. 17196-98 (Dynes).

"Report to Congress: NRC Incident Response Plan," September 1980), and to describe the NRC's planning for an incident at TMI. From the record thus made, the Commonwealth determined that its primary concern was with the communications between the NRC and various Commonwealth agencies and the correct identification of which Commonwealth agency is to be contacted under certain circumstances. Tr. 21825 (R. Adler). Meetings were held between the NRC Staff and Commonwealth officials to discuss the Commonwealth's concerns and arrive at a resolution of them. Tr. 17103-04 (Straube, Gray).

61. Subsequent to those meetings, the Commonwealth's representative indicated that an agreement had been reached with the Staff whereby specific instructions on communications and contacts with Commonwealth agencies would be inserted in the NRC's emergency procedures, that the Commonwealth would consider the issue resolved when those procedures were completed, and that the Commonwealth considered the issue closed as far as this Licensing Board and the restart hearing are concerned. Tr. 21825 (R. Adler). That being the case, we find the matter of the Commonwealth's concerns regarding the NRC's incident response to be closed.

B. Accident Assessment and Dose Projection

62. One of the basic elements of an emergency response is the assessment of plant conditions and classifying the emergency. This element of emergency response has been factored into the development of the Licensee's emergency response capabilities.

Rogan et al., ff. Tr. 13756, at 16-17. The control room operators would initially be made aware of an accident by alarms and instrument readings. Based on plant process monitors and radiation monitors, readings and/or calculated dose projections would be compared to emergency action levels (EAL's) and an emergency classified according to EAL's which have been exceeded. Rogan et al., ff. Tr. 13756, at 17-18, 67-69. The accident classification scheme utilized by the Licensee is that required by 10 CFR Part 50, Appendix E wherein an accident is categorized in any one of the four classes of Unusual Event, Alert, Site Area Emergency or General Emergency. Chesnut, ff. Tr. 15007, at 4-5; Staff Ex. 6, at 9. This same accident classification scheme is followed by the Commonwealth and the five risk counties for TMI. Rogan et al., ff. Tr. 13756, at 71-72.

63. In this area of accident assessment and dose projection, specific contentions have been raised on the matters of accident classification and radiation monitoring. These contentions are addressed below.

1. Accident Classification

64. In the area of accident classification, three contentions have been raised challenging the use of fractions of EPA Protective Action Guides (PAG's) for classifying an emergency (Contention EP-7), questioning certain triggering events or conditions used in accident classification (Contention EP-8) and challenging the use of adverse meteorology assumptions in

accident classification (Contention EP-9). In a related area, the Staff raised concerns about the containment leak rate assumptions used by the Licensee in projecting doses under certain conditions. With regard to Contention EP-7, that contention states:

The fractions of EPA PAGs listed on p. 4-1 of the Plan, with their associated action levels, do not take into account the total accumulated dose and dose commitment. As a result, the total exposures may exceed by large margins the listed PAG fractions prior to the advancement to a higher emergency category.^{13/}

65. In supporting this contention through the direct testimony of Intervenor's witness Dr. Bruce Molholt, it became apparent that the thrust of the Intervenor's assertion is that the Licensee's use of EPA PAGs for accident classification purposes ignores exposures from the ingestion pathway. Molholt, ff. Tr. 19690, at 1-2. Such actual exposures, it is claimed, could be higher than projected exposures because the NRC's earth-to-plant and plant-to-human transfer factors utilized in dose projection are allegedly low by orders of magnitude. Molholt, ff. Tr. 19690, at 3. Thus, according to Dr. Molholt, actual dose received by certain segments of the population will substantially exceed PAG's under conditions where the Licensee,

^{13/} Under the provisions of the Licensee's Emergency Plan, projected doses from an accident exceeding certain fractions of EPA PAG doses will result in the accident being classified in the Alert, Site Emergency or General Emergency categories depending on the level of the projected dose. Licensee Ex. 30, at 4-1.

acting under provisions of its Emergency Plan, would project doses that are only fractions of PAG's. Molholt, ff. Tr. 19690, at 3.

66. First, it is notable that the fact that total hypothetical exposure to an individual may exceed a PAG fraction before Licensee advances its accident classification to a higher class is of no significance because the PAG fractions are used in this regard only for accident classification, not for recommending or taking protective actions. The PAG fractions could be exceeded substantially and yet projected doses would still be far below levels requiring protective actions. Chesnut, ff. Tr. 15007, at 13-14. Moreover, the data and studies on which Dr. Molholt bases his claim that transfer factors are underpredicted utilized maximal values intended to result in a maximal calculated dose. Tr. 19762-63 (Molholt). Measured concentrations of radionuclides in the environment near 17 operating nuclear power plants in the United States were one to two orders of magnitude lower than the concentrations predicted using the data relied upon by Dr. Molholt. Tr. 19774 (Molholt). In view of this, we find no basis to fault the Licensee for the manner in which it utilizes fractions of PAG's for accident classification or for requiring a change in Licensee's approach.
67. As to the assertion in the contention concerning accumulated dose, it is true, consistent with EPA guidance, that the PAGs do not account for doses unavoidably received prior to the

time the dose assessment began. Rogan et al., ff. Tr. 13756, at 74. However, to the extent that prior accumulated doses from the accident in question are known to the Licensee, they will be accounted for and included in projected doses and in determining protective actions. Tr. 14335 (Rogan); Tr. 14531 (Tsaggaris); Tr. 15202-204 (Chesnut). The evidence shows that the Licensee's use of fractions of lower EPA PAG's for accident classification purposes is conservative and will not prevent escalation to a more severe accident class based on plant conditions or emergency action levels. Chesnut, ff. Tr. 15007, at 8-9. The Licensee's use of the lower limit PAG's in this manner for emergency classification is consistent with the guidance of NUREG-0054. Chesnut, ff. Tr. 15007, at 8-9; Staff Ex. 23, at II-11. Accordingly, we find Contention EP-7 to be without merit and we reject it.

68. Contention EP-8 states:

The various emergency categories (p. 4-2 to 4-8) each list a number of triggering events or conditions. Many of these are questionable indicators. For instance, on p. 4-3, "Valid" alarms are referred to. But there is no mention of the definition of a "valid" alarm, or what would be an invalid alarm. A number of reactor coolant activities (50, 130, and 300 micro-Ci/ml) are referred to, but no mention is made of how much fuel damage it takes to produce these readings. In addition, there is no indication of how or how rapidly these coolant activities will be determined.

This contention questions certain indicators used as indications of the existence of an emergency and of particular accident classifications. Using EAL's based on specific instrument readings, plant parameters and equipment status,

operators are to classify accidents and formulate protective action recommendations. Chesnut, ff. Tr. 15007, at 27. In this regard, Intervenors' concern is that Licensee relies on "valid alarms" without defining what valid alarms are.

69. Licensee has indicated that, by use of this term, it intended to refer to confirmed alarms or alarms which are verified by observations of other supporting indicators or alarms. Rogan et al., ff. Tr. 13756, at 75. While there is always the possibility that operators may ignore alarms, there are at TMI-1 redundant indicators and meters for EAL parameters. Tr. 14564 (Giangi). Operators will normally monitor related instrumentation to determine if an alarm is valid or erroneous. Chesnut, ff. Tr. 15007, at 27. Licensee maintains specific alarm procedures for determining whether an instrument or alarm is malfunctioning or not operating and whether there is an erroneous indication. Tr. 15239 (Chesnut). We find that these procedures, together with the multiple indicators of abnormal conditions that should be available will tend to minimize the likelihood that valid alarms will be ignored.

70. Intervenor further complains in this contention that Licensee's reliance on reactor coolant activity levels for accident classification is misplaced because there is no indication of the amount of fuel damage corresponding to the reactor coolant activity EALs and because it is not clear how or how rapidly reactor coolant activity can be measured. In

response, the Licensee has indicated that the 50 micro-Ci/ml reactor coolant activity level is a level greater than normally expected, is greater than any previously experienced spike in coolant activity, and is roughly equivalent to 0.1% fuel failure. Rogan et al. ff. Tr. 13756, at 75-76; Chesnut, ff. Tr. 15007, at 28. 130 micro-Ci/ml is approximately one-half the operational limit for failed fuel in the technical specifications (Chesnut, ff. Tr. 15007, at 28), is a positive indication of clad failure (Rogan et al. ff. Tr. 13756, at 75-76), and represents about 1/3% failed fuel. Chesnut, ff. Tr. 15007, at 28. NUREG-0654, Appendix 1 suggests that the 300 micro-Ci/ml reactor coolant activity is indicative of clad damage approaching about 1%. Id. ^{14/} Thus, the degree of fuel damage corresponding to these reactor coolant activity levels are indeed defined. As to procuring reactor coolant for determining activity levels, the Licensee has modified its reactor coolant sampling procedures to provide additional shielding, protective equipment and dosimetry to allow high activity samples to be taken. Under these revised procedures, a reactor coolant sample can be obtained and analyzed in less than three hours, the time specified in

^{14/} The Staff had raised a concern that the use of the 300 micro-Ci/ml EAL as proposed by the Licensee was inconsistent with the criteria of NUREG-0654. Chesnut, ff. Tr. 15007, at 28; Staff Ex. 23, at II-11. The Licensee has since committed to modify its EAL in this regard to precisely comply with NUREG-0654 guidance. Tr. 22880 (Chesnut).

NUREG-0737, "Clarification of TMI Action Plan Requirements," for such an operation. Chesnut, ff. Tr. 15007, at 29. In addition to this, there are other methods for classifying an accident based on fuel damage which do not require the sampling and analysis of a coolant sample. Letdown monitor RML-1 indicates coolant activity and may be used for this purpose and the Licensee's Emergency Plan specifically defines accident classes based on readings from that monitor. The monitor can be read in the control room, thus allowing rapid accident classification based on coolant activity levels without the need to take reactor coolant samples. Tr. 15156-59 (Chesnut).

71. Based on the evidence as outlined above, we find the assertions in Contention EP-8 to be unsubstantiated and we reject that contention.
72. Contention EP-9 states:

Reliance on "adverse meteorology" (p. 4-5, 4-6), can prove to provide little or no "built-in conservatism" (p. 4-7, 4-8) since, for instance, such conditions were not at all uncommon during the nighttime in the nights following the TMI-2 accident (for instance, the night of March 29, from 10 p.m. to 8 a.m., March 30; night of March 31, about 8 p.m. to 8 a.m., April 1).

Under the Licensee's Emergency Plan, "adverse meteorology" assumptions will be used to project doses for use in classifying an emergency. NUREG-0654, Appendix 1 contains guidance to the effect that adverse meteorology should be used in developing EAL's for a Site Area Emergency but Licensee uses it for both the Alert and Site Area Emergency categories.

Rogan et al., ff. Tr. 13756, at 76-77. The adverse meteorology assumptions for TMI are a wind speed of 1.5 MPH and a Pasquill F stability resulting in poor dispersion. For TMI, more adverse weather conditions would occur less than 5% of the time. Levine, ff. Tr. 17298, at 7.

73. Use of the adverse meteorology assumptions allows declaration of an emergency based on data readily available in the control room without the need to calculate actual site meteorology. Rogan et al., ff. Tr. 13756, at 76-77. The use of the adverse meteorology assumptions results in poor dispersion of a release of radioactive material. The evidence shows that, since adverse meteorology should exist less than 5% of the time, the adverse meteorology assumptions should result in underpredicting dilution and overpredicting radioactive concentration of releases most of the time and in accurately predicting dilution and radioactive concentrations in the small percentage of the time that poor dispersion conditions actually exist. Levine, ff. Tr. 17298, at 9. Based on this, we find the Licensee's adverse meteorology assumptions to be appropriate and conservative and Contention EP-9 to be without merit.
74. In the Staff's Safety Evaluation Report on emergency preparedness for TMI-1, the Staff raised a concern about the Licensee's assumptions about containment leak rate used in dose projections. Staff Ex. 6, at 18, 30. The specific concern was that the Licensee's intended use of a containment

leak rate based on the containment maximum design pressure might result in overly conservative leak rates for dose projection and in subsequent inaccurate or erroneous protective action recommendations. Tr. 13771, 14605 (Giangi). In response to this Staff concern, the Licensee generated a curve of estimated containment leak rate as a function of containment design pressure and actual measured pressure which will be factored into Licensee's Emergency Plan Implementing Procedures for offsite dose projection. This procedure will provide an approximate upper bound containment leak rate at a particular containment pressure and yet a lower and more realistic leak rate than that obtained using maximum design pressure. Staff Ex. 23, at II-6, II-7. We find this to be a satisfactory resolution of the problem identified by the Staff.

2. Radiation Monitoring

75. In the area of radiation monitoring, specific contentions or Licensing Board Questions were raised concerning the use of mobile monitoring teams, the desirability of installing offsite remote readout monitors, the adequacy of the Licensee's offsite radiological dose analysis capability and the adequacy of the Licensee's Radiological Environmental Monitoring Program (REMP).

(a) Mobile Monitoring Teams

76. In Contention EP-4(I), it is asserted that:

The time provided in the EP for accident assessment, 1/2 hour (EP, p. 6-7), is in excess of the maximum permissible therefor specified in the Standard Review Plan, NUREG-75/087, Sec. 13.3(ii)(3). (EP fig. 21 shows the thyroid PAG of 5 rems being reached in 12 minutes at 600 meters.) Moreover, the estimate given is unsupportable for monitoring of offsite locations on nearby islands or on the west shore of the Susquehanna River. Such factors may become critical in the event of a general emergency, which produces a "shift" in emphasis to greater offsite monitoring efforts" (EP, p. 6-6). (See EP-3(C)(1)).

At the outset, we note that there is no NRC requirement setting forth a specific time within which accidents are to be assessed. Rather, the Licensee is to have the capability to make a rapid initial assessment and accident classification. Chesnut, ff. Tr. 15007, at 15-16. At the onset of an emergency, reactor operators would initially be made aware of the accident by alarms and control room instrumentation. Rogan et al., ff. Tr. 13756, at 17. Based on control room instrumentation, process monitors and radiation monitors, a comparison of parameters to EAL's would be made and the emergency classified. Id. at 67. A system of radiation monitors measures and records radiation levels throughout the facility and monitors all gaseous release paths with displays of the readings in the control room. Readings from this system as well as meteorological information will be used in accordance with Emergency Plan Implementing Procedures to project offsite doses. Id. at 68-69, 77-78. This system will aid in rapid accident classification and threat assessment (Staff Ex. 6, at 18) and enable the Licensee to project off-site radiological

- consequences within minutes of emergency declaration. Donaldson, ff. Tr. 17354, at 6.
77. Under the Licensee's system, initial accident assessment and dose projection are accomplished through the use of in-plant parameters and information available in the control room. Riethle, ff. Tr. 14842, at 9-10. Offsite monitoring teams are not needed and not relied upon for that purpose. In fact, it would be undesirable and inappropriate to rely on offsite monitoring teams for initial accident assessment and dose projection since the accident should be classified and offsite agencies notified prior to plume arrival offsite. Chesnut, ff. Tr. 15007, at 15-16. Rather, the purpose of the offsite monitoring teams is to provide information to confirm or refine the initial offsite dose projections. Donaldson, ff. Tr. 17354, at 7. As such, the time that it may take to dispatch monitoring teams and receive offsite readings has no bearing on the time required for initial accident assessment and dose projection and Contention EP-4(I) is without merit in that regard.
78. The Licensee has indicated that for a General Emergency, there will be a greater emphasis on offsite monitoring. Rogan et al., ff. Tr. 13756, at 26. In addition, the evidence indicates that for certain places on the west shore of the Susquehanna River in the vicinity of TMI, such as Goldsboro, it would be 40 to 45 minutes before a monitoring team could

obtain readings. Tr. 14672-73 (Giangi). Thus, more immediate means for offsite monitoring on the river island and the west shore of the river would be useful. Chesnut, ff. Tr. 15007, at 17. Nevertheless, because of the Licensee's use of in-plant instrumentation and site meteorology for accident classification and dose projection, immediate offsite monitoring is not necessary and the Licensee's planning is not deficient in this regard. Id. There is no evidence of inadequacies in the Licensee's accident assessment and dose projection provisions as asserted in Contention EP-4(I) and we find that the contention is without merit.

79. Contention EP-18 states, in part:

It is also contended that the Licensee does not possess adequate portable radiation monitors to provide additional information in the event of an offsite radiation release, and that the Licensee does not exercise adequate administrative control over the maintenance of these units, nor the training of personnel in their use. It is contended that the radiation monitoring program of the Licensee must be greatly upgraded prior to restart to ensure adequate protection of the public health and safety.

The evidence indicates that the Licensee has specifically designated 75 portable radiation monitoring instruments for emergency use: 25 air samplers, 25 dose rate meters, 20 beta/gamma survey meters, and 5 dual channel analyzers. Of these 75 instruments, 5 air samplers, 5 dose rate meters and 5 dual channel analyzers are designated for use by 5 environmental monitoring teams in an emergency. The evidence indicates that this is an adequate number of portable radiation monitoring instruments for emergency monitoring team

use. Donaldson, ff. Tr. 17354, at 12-13. In addition, the evidence indicates that the Licensee's emergency organization staffing provides sufficient numbers of personnel to operate this equipment. Id. at 14. The Staff confirmed that the Licensee's portable radiation monitoring kits set aside for use in emergencies were indeed in place in an inspection conducted on May 4-7, 1981. Chesnut (Unresolved Matters), ff. Tr. 22235, at 8.

80. In addition, the Licensee has a final, approved procedure for inventory, operational checks, and calibration of this portable monitoring equipment on a quarterly basis. After the quarterly checks and calibration, the monitoring kits are sealed and monthly checks made to assure that the seals are intact. In its May 4-7 inspection, the Staff verified on a spot check basis and through review of inventory records that the portable radiation monitoring equipment had been inventoried and calibrated in accordance with the procedure. Chesnut (Unresolved Matters), ff. Tr. 22235, at 8-9. Thus, we find that the Licensee is exercising adequate administrative control over the maintenance of this equipment.
81. Those personnel assigned to form monitoring teams and to use this portable monitoring equipment are radiological control technicians and auxiliary operators. Under the Licensee's Emergency Plan, these personnel are given specialized training in use of the equipment and in onsite/offsite monitoring techniques and procedures. Although not all such training is complete at this time, Licensee has committed to complete one

full training cycle for its personnel prior to restart. The Staff observed the use of such equipment by the Licensee's monitoring team personnel in the joint exercise held on June 2, 1981 and reported that the monitoring teams demonstrated an adequate working knowledge of the equipment and survey techniques. Chesnut (Unresolved Matters), ff. Tr. 22235, at 9-10. Accordingly, the evidence shows that adequate training in the use of the portable radiation monitoring equipment has been, and will continue to be, provided to personnel assigned to use such equipment.

82. We have found that the Licensee possesses and has designated for emergency use adequate quantities of portable radiation monitoring equipment and has assigned adequate numbers of personnel to monitoring teams in an emergency. We have further found that Licensee exercises adequate administrative control over the maintenance of such equipment and the training of personnel in its use. Accordingly, the portion of Contention EP-18 alleging inadequacies in these regards is without merit.

(b) Offsite Remote Readout Monitors

83. Contention EP-3(C)(1) asserts that:

The NRC's vague instruction to the licensee to "upgrade" in generally unidentified respects its "offsite monitoring capability" is insufficient to assure that such upgrading will result in the ability to obtain and analyze the type and volume of information essential for protection of the public health and safety. ANGRY contends that such capability must at minimum encompass the following elements or their equivalent:

(1) Permanent offsite monitoring devices which register all forms of ionizing radiation and which can be remotely read onsite.

Without passing judgment on the merits of this contention or on the need for permanent offsite monitoring devices that can be remotely read onsite, the Licensing Board inquired, in what has been designated as Board Question 4(a):

Has the Licensee considered stationing a limited number of dose rate meters near the site, with the data telemetered to the control room or the response center?
Tr. 2393.

84. In response to both the Licensing Board's question and Contention EP-3(C)(1), the Licensee indicated that it is installing real time offsite dose rate meters that can be read remotely. The instruments have a sensitivity down to 1 micro-rem/hr. Rogan et al., ff. Tr. 13756, at 84-86; Tr. 14821-22 (Rogan). The system is a 16 station array of stationary monitors that essentially circle the site. Tr. 14821-22 (Rogan). The system itself consists of high and low level direct radiation sensors, transmitters, a receiver and a central processing computer. It will provide the instantaneous dose rate for each station location with a range of 0 to 10 R/hr. Riethle, ff. Tr. 14842, at 9. Data from each station is transmitted to the central processing computer in the Environmental Assessment Command Center every four seconds and printed out by the computer every five minutes. Tr. 14844, 14964-65 (Riethle). Locations of the 16 sensor stations were

based on population density, site meteorology and local topography. Riethle, ff. Tr. 14842, at 9.

85. At the present time, this real time monitoring system, installation of which was to be completed by the end of April 1981 (Tr. 14850 (Riethle)), is not a part of the Licensee's Emergency Plan and is not relied upon by the Licensee for emergency response purposes. Chesnut, ff. Tr. 15007, at 75; Tr. 13999 (Giangi).^{15/} The NRC Staff indicated that current NRC requirements and guidance do not call for use of such a system (Chesnut, ff. Tr. 15007, at 73) and that a real time remote reading monitoring system would not significantly improve or accelerate accident classification and assessment. Indeed, under the Licensee's accident assessment and dose projection scheme, operators can initially assess and classify an accident, notify offsite agencies, and make protective action recommendations in many cases before a radioactive plume could travel to the offsite monitors. Chesnut, ff. Tr. 15007, at 75-76. Since such actions are based on plant status and inplant effluent monitors, an offsite monitoring system is not needed for such purpose. Riethle, ff. Tr. 14842,

^{15/} However, when the system is fully installed and operational and after it has been functionally tested, Licensee will modify its Emergency Plan and EPIPs to reflect reliance on the system for use in verifying source term and dose projection calculations. Tr. 14613-14 (Rogan, Giangi).

at 9-10; Tr. 14002-03 (Tsaggaris); Rogan et al., ff. Tr. 13756, at 84-86.

86. While a remote reading real time monitoring system is not necessary for accident assessment and dose projection, it could be useful for detecting releases that escaped detection by inplant monitors (Tr. 15232 (Chesnut)).^{16/} However, even for that purpose, plant operators have at their disposal many plant parameters which would indicate an abnormal situation, particularly an abnormal situation which would result in a significant unmonitored release. Tr. 14102-03 (Tsaggaris). In addition, a remote reading offsite monitoring system would be of some use in verifying or confirming offsite dose projections without the potential time delay in obtaining offsite dose readings from monitoring teams. Its usefulness in this regard is limited, however, by the number and location of the offsite monitors. Chesnut, ff. Tr. 15007, at 73-74, 76.^{17/}

^{16/} The record is devoid of any evidence indicating whether, or by what mechanism, an unmonitored radioactive release could occur.

^{17/} With regard to concerns raised during the course of the proceeding about the length of time it would take to dispatch a monitoring team to, and receive readings from, Goldsboro which is in the vicinity of the plant site but on the opposite side of the river, we note that the Licensee's remote reading monitoring system has one monitor location in the vicinity of Goldsboro. Riethle, ff. Tr. 14842, at Table 2. This will allow the Licensee to receive instantaneous dose readings from the Goldsboro area without the time delay inherent in sending a mobile monitoring team to that area.

87. From the evidence presented, we find that a remote reading offsite monitoring system, while useful, is not needed for accident assessment and classification or for making dose projections and protective action recommendations. Accordingly, we find Contention EP-3(C)(1) to be without merit. Nevertheless, the Licensee has provided a remote reading offsite monitoring system which will compliment its confirmatory offsite monitoring teams.

88. In a related matter, the Licensing Board inquired, in what has been designated Board Question 4(b):

Has the licensee considered placing meters which publicly measure background radiation levels at a number of public places, thereby enabling the populace to know what the level is? Tr. 2393.

In response, the Licensee indicated that each offsite station of its remote reading monitoring system has both an instantaneous readout and a stripchart readout display which members of the public can view. Riethle ff. Tr. 14842, at 9; Tr. 14848 (Riethle). Thus, the Licensee has, in fact, provided monitors that can be read by members of the public, enabling the populace to know what background radiation levels in the vicinity of the plant may be. We find this to be a satisfactory response to our inquiry.

(c) Analysis Capability

89. Contention EP-3(C)(2) challenges the Licensee's dose projection analysis capability. This contention asserts:

The NRC's vague instruction to the licensee to "upgrade" in generally unidentified respects its "offsite

monitoring capability" is insufficient to assure that such upgrading will result in the ability to obtain and analyze the type and volume of information essential for protection of the public health and safety. ANGRY contends that such capability must at minimum encompass the following elements or their equivalent:

(2) Information analysis capability equal to or greater than that provided by the Atmospheric Release Advisory Capability System (ARAC). This contention now challenges the adequacy of the licensee's MIDAS radiological assessment system (EP, p. 6-9) to the extent that the information analysis capability it provides does not equal or exceed that provided by the ARAC system.

90. Initial dose projections in an emergency are made by the Licensee using the inplant radiation monitoring system and meteorological data available in the control room. Tr. 13893 (Tsaggaris). Once the Licensee's Environmental Assessment Command Center (EACC) becomes operational, dose projections for use in formulating protective action recommendations are made from that location using the Licensee's MIDAS radiological assessment system, which utilizes real-time meteorological data and radiation monitor data input to the MIDAS computer. Tr. 13895-96 (Giangi); Tr. 14909-910 (Riethle). The real time meteorological data for MIDAS comes from the onsite meteorological tower. The MIDAS program itself incorporates parameters of the "Class A" meteorological model of NUREG-0654 and includes topographical characteristics of the site, input effluent releases, 15-minute average meteorological data, site specific climatological effects such as seasonal-, diurnal-, and terrain-induced flows, and historical dispersion factors. Tr. 14843-44, 14866 (Riethle).

With this data, MIDAS produces dose isopleths (Tr. 14866 (Riethie)) and predictions of plume path and plume touchdown points. Tr. 14882 (Riethle). Output of the MIDAS program includes distance and direction from the site where maximum doses will occur with whole body, skin and thyroid dose projections for the maximally exposed individual. Tr. 14882, 14884 (Riethle). The evidence demonstrates that the MIDAS system satisfies the Class A model criteria of NUREG-0654, Appendix 2. Rogan et al., ff. Tr. 13756, at 82; Tr. 17299-300 (Levine).

91. The MIDAS program provides accurate dose projections out to a distance of about 10 miles from the site (Tr. 17300-301, 17325, 17327 (Levine)), and, with the MIDAS output modified by the Licensee's local meteorologist^{18/} for projections beyond 10 miles, may be used for dose projection out to about 50 miles from the site. Tr. 14970-71 (Riethle); Tr. 17325, 17331-32 (Levine).
92. ARAC, a program similar to MIDAS run by the Environmental Protection Agency, is not used by Licensee. ARAC requires support from the Lawrence Livermore Laboratories in California and, for long distance dose projections, requires activation of computers in California which could result in delays in

^{18/} The Licensee employs a meteorologist who normally is stationed at the EACC at the Harrisburg International Airport. Tr. 14223 (Giangi).

getting projections from the ARAC program. Tr. 17341-42 (Levine). During the venting of krypton from the TMI-2 containment, the Licensee used MIDAS and EPA used ARAC to project offsite doses. The plume and offsite dose projections were verified with offsite monitoring teams. That experience showed that MIDAS was more reliable more often than ARAC. Tr. 14877 (Riethle); Rogan et al., ff. Tr. 13756, at 82-83. From the krypton venting experience, MIDAS was shown to be somewhat conservative, to predict doses within a factor of two, and to be most accurate when dispersion characteristics were stable - the time when it is most necessary to have accurate dose projections. Tr. 14894-97 (Riethle). The krypton venting experience also showed that ARAC was not as sensitive or as accurate in predicting plume location as MIDAS within 10 miles of the site. Tr. 14964 (Riethle).

93. The evidence shows that, within 10 miles of the site, MIDAS provides a rapid information analysis capability which is comparable to ARAC. Beyond 10 miles, MIDAS together with the Licensee's meteorologist provides an assessment capability comparable to ARAC. Levine, ff. Tr. 17298, at 10-11. Based on the krypton venting experience, MIDAS would appear to provide better and more timely dose projections than ARAC. Accordingly, we find that the Licensee's MIDAS radiological assessment capability is at least comparable to the capability of ARAC and that Contention EP-3(C)(2) is without merit.

(d) Licensee's Radiological Environmental Monitoring Program

94. In Contention EP-18, Intervenors raise concerns about the adequacy of the Licensee's Radiological Environmental Monitoring Program (REMP). That contention states, in part, that:

It is contended that the Licensee's environmental radiation monitoring program contains an insufficient number of monitoring sites and an inadequate distribution of monitoring sites within twenty miles of the Unit 1 site to provide safety. It is further contended that there is in the Licensee's environmental radiation monitoring program an unwarranted reliance on the use of thermoluminescent dosimeters (TLDs) for providing information used to calculate radiation exposure data and that this unwarranted reliance on TLDs seriously underestimates radiation doses to the public.

The Licensee's REMP was also the subject of the Commission's August 9, 1979 Order and Notice of Hearing in this proceeding wherein the Commission directed, as short term action 3(c), that the Licensee is to "[U]pgrade offsite monitoring capability, including additional thermo-luminescent dosimeters or equivalent." CLI-79-8, 10 NRC 141, 144 (1979).

95. The REMP is a systematic sampling and monitoring program for air, water and terrestrial media to provide information to determine whether radiological exposures are within regulatory limits and to monitor for the long-term buildup of radionuclides in the environment. Riethle, ff. Tr. 14842, at 1-2. REMP monitoring locations are chosen based on site meteorology, river hydrology, local demography and differential land use. Riethle, ff. Tr. 14842, at 5. For monitoring purposes, the REMP utilizes, among other devices,

thermo-luminescent dosimeters (TLD) placed in accordance with the NRC Staff's Branch Technical Position set forth in Regulatory Guide 4.8 which recommends at least 40 monitoring positions with an inner ring at approximately the site boundary, an outer ring at four to five miles from the site and a monitor in each of 16 radial sectors in each ring. Riethle, ff. Tr. 14842, at 5-6. The TMI REMP has TLD's at 73 locations with 30 TLD's located in areas of special interest within 5 to 20 miles of the site. Id. There are also eight offsite fixed air sampling locations. Donaldson, ff. Tr. 17354, at 9. The TLDs used in the REMP have a dual capability, measuring gamma and combined beta/gamma. Riethle, ff. Tr. 14842, at 6.

96. The purpose of the REMP is to provide an after-the-fact or historical assessment of radiological impact. Riethle, ff. Tr. 14842, at 4. The offsite TLD monitors are not used or relied upon for initial accident assessment or for dose projection and protective action recommendations and they are of little value in a short duration emergency where there are high level releases over short periods of time. Donaldson, ff. Tr. 17354, at 10-11; Rogan et al., ff. Tr. 13756, at 83. Consequently we find that the TLD monitoring under the REMP is not critical to an effective initial emergency response by the Licensee.
97. For the intended purpose for which the REMP with TLD monitoring was established - to provide an after-the-fact measure of radiological impact - the evidence shows that

Licensee does not place an unwarranted reliance on TLDs. The TLDs used by the Licensee comply with the standards of Revision 1 of Regulatory Guide 4.13, (Riethle, ff. Tr. 14842, at 7) and have been demonstrated to be effective devices for quantifying exposures offsite. Donaldson, ff. Tr. 17354, at 11. The TLDs are processed by REMP laboratories which are required to participate in EPA's interlaboratory comparison program and the laboratories are subject to quality control programs. Riethle, ff. Tr. 14842, at 8. The evidence shows that the Licensee's REMP complies with Regulatory Guide 4.8 as amended in November 1979 to increase the number of monitoring stations and that the Licensee's TLD stations are sufficient in number and location to adequately quantify exposure in the environment. Riethle, ff. Tr. 14842, at 4; Donaldson, ff. Tr. 17354, at 11. The evidence further demonstrates that the Licensee has significantly upgraded its offsite monitoring capability in accordance with short term action 3(c) of the Commission's August 9, 1979 Order and Notice of Hearing. Donaldson, ff. Tr. 17354, at 12. Thus, we find that Licensee has complied with short term action 3(c) of the Commission's Order. We further find that the portion of Contention EP-18 directed to the Licensee's REMP and Licensee's reliance on TLDs is without merit.

C. Initial Notification of Governmental Units

98. Several of the contentions which were raised and admitted as issues in the proceeding deal with the initial notification of governmental units in an emergency. Specifically, these contentions are directed to the sequence of notification of government authorities and with the information transmitted to offsite authorities.

1. Sequence of Calls

99. Contention EP-4(G), alleging inadequacies in the procedures for notifying counties in the plume EPZ of an emergency, states:

The licensee's emergency notification procedures (pp. 6-2, 6-3, 6-4; Figure 15) (see also Pa. DOP Appendix 3) are inadequate with respect to certain areas directly at risk in the event of a nuclear accident, namely, York and Lancaster Counties. Although the Dauphin County Emergency Operations Center receives immediate notification of an emergency declaration, notification of York and Lancaster Counties must follow an excessively circuitous path:

1. Licensee to Dauphin
2. Licensee to PEMA
3. PEMA to BORP
4. BORP to Licensee
5. Licensee to BORP
6. BORP to PEMA
7. PEMA to Dauphin
8. PEMA to York, Lancaster, and Cumberland Counties

Such a notification sequence is in direct conflict with requirements that "delegations of authority that will permit emergency actions (such as evacuation) to be taken with a minimum of delay should be carefully considered" (UREG-75/111, § A3) and that "Upon declaration of a

'general emergency' immediate notification shall be made directly to offsite authorities responsible for implementing protective measures . . ." (EPRG I:(A)(5)) (emphasis in original). Also, H. 0654 J7.

Contrary to the allegations of this contention, the Licensee will directly notify the State and all five counties in the plume EPZ immediately upon declaration of a General Emergency. Chesnut, ff. Tr. 15007, at 37; Rogan et al., ff. Tr. 13756, at 62. Thus, the Licensee's notification provisions are wholly adequate in that regard.

100. For emergencies in the Unusual Event, Alert and Site Emergency categories, provision is made for the Licensee to directly and immediately notify Dauphin County and PEMA and for PEMA to then notify BRP and the five counties in the plume EPZ. Chesnut, ff. Tr. 15007, at 38; Rogan et al., ff. Tr. 13756, at 86-87. Thus, the sequence of notifications alleged in the contention, which implies that counties other than Dauphin County would not be notified until after seven other calls had been made, is misleading and incorrect.
101. For the emergency classifications in which the Licensee does not notify York, Lancaster, Lebanon and Cumberland Counties directly, the Licensee and Dauphin County have established contingency procedures whereby Dauphin County will notify the other counties in the event that PEMA has failed to do so.^{19/}

^{19/} NUREG-0654 criteria do not call for notification of the state and risk counties in any particular sequence for the Unusual Event, Alert and Site Emergency categories and the Licensee's provision for notification of the state and counties in these emergency categories are not inconsistent with NUREG-0654 guidance. Chesnut, ff. Tr. 15007, at 38-39.

The evidence indicates that, with these contingency procedures, these four counties should be notified within 15 minutes of declaration of an emergency. Chesnut, ff. Tr. 15007, at 38. Where the contingency procedures are not invoked and PEMA notifies the four counties, such notification is likely to be as rapid as if the Licensee had notified those counties directly. Rogan et al., ff. Tr. 13756, at 89.

102. As to the assertion in the contention that Licensee's delegation of notification responsibility in the Unusual Event, Alert and Site Area Emergency categories is inconsistent with federal guidance, we find, to the contrary, that such delegation in other than the General Emergency category is wholly consistent with the guidance that "delegations of authority that will permit emergency actions . . . to be taken with a minimum of delay should be carefully considered." Chesnut, ff. Tr. 15007, at 39-40. Notification of York, Lancaster, Lebanon and Cumberland Counties by parties other than the Licensee would relieve the Licensee's onshift personnel of some notification burdens, allowing them to concentrate on other emergency response actions.
103. In summary, we find that the established notification provisions asserted to be inadequate in Contention EP-4(G) are, in fact, adequate and that the contention is without merit.

2. Information Transmitted

104. Contention EP-1 states, in part, that:

All data and plant operating personnel observations relative to all radioactive releases must be transmitted immediately and simultaneously to the NRC, Pennsylvania Department of Environmental Resources, the commissioners of Dauphin, York and Lancaster Counties and the licensee's management. It is further contended that licensee must provide this capability before restart of TMI-1.

Upon declaration of any of the four classes of emergency, the Licensee will immediately notify both the NRC and PEMA and provide information on the accident class, the potentially affected populace and geographical areas, and the type and magnitude of potential or actual releases. Subsequent followup messages to the NRC and BRP transmitting a broad range of information on radioactive releases, prevailing weather conditions, projected doses and dose rates, and radioactive contamination are provided for in the Licensee's Emergency Plan. This information will be provided to the NRC over a direct "Emergency Notification System" line and to BRP over a direct "Radiological Line" which can be kept open throughout the course of the accident. Chesnut, ff. Tr. 15007, at 29-31.

105. For : General Emergency, the Licensee will directly and immediately notify all five counties in the plume EPZ and provide information on the emergency class, the populace and geographical areas potentially affected and the type and magnitude of potential or actual releases. The same information will be provided to the counties under the other

three emergency classes but only Dauphin County will be notified directly by the Licensee with the other counties notified by PEMA. Nevertheless, for all emergency categories, the capability exists for providing information to the counties on radioactive releases directly from the TMI-1 control room. Chesnut, ff. Tr. 15007, at 31-32. Provision has not been made for initial notification or for the transmission of information on radioactive releases directly to county commissioners as it is not required and it is simply not possible for the commissioners to be directly reachable from the TMI site or from PEMA on a 24 hour-per-day, 7 day-per-week basis. Chesnut, ff. Tr. 15007, at 33.

106. The Licensee's Emergency Plan provides for notification of appropriate Licensee management through emergency call-out procedures. Chesnut, ff. Tr. 15007, at 33-34. These provisions for notification and information transmission to Licensee's management as well as to Commonwealth agencies and risk counties apply in circumstances where one of the four classes of emergencies has been declared. There are no emergency plan provisions for notification and information transmission in non-emergency situations in which no emergency has been declared. Chesnut, ff. Tr. 15007, at 34-35.
107. Insofar as EP-1 asserts that notification should be made and information should be transmitted relative to all

radioactive releases, we note that there is no regulatory requirement for such immediate reporting when the releases involved are planned, routine releases within the limits of NRC regulations and the TMI-1 license. Chesnut, ff. Tr. 15007, at 35-36. There is no evidence of record which indicates that the notification and information reporting sought by EP-1 for radioactive releases in non-emergency situations can or should be required as a condition of restart. Consequently, we must reject this contention insofar as it applies to radioactive releases in non-emergency situations.

108. Even in an emergency where one of the four classes of emergency has been declared, there is no evidentiary basis for requiring the reporting of "all data" and all "plant operating personnel observations" relative to radioactive releases. It is far from clear that all such information would even be pertinent or useful. In short, we find no basis in the record for requiring notification and information reporting provisions beyond those already called for in Licensee's Emergency Plan. For this reason, Contention EP-1 must be rejected.

109. Contention EP-4(E) asserts that:

The licensee's EP fails to provide for furnishing to the Pennsylvania Bureau of Radiation Protection (BORP) information called for in the latter's plan such as "nature of the failure, the status of safeguards, the condition of consequence mitigating features" (p. VI-1).

Contrary to the assertions in this contention, the Licensee's Emergency Plan provides for the transmission of information to BRP on the nature of the failure, the status of safeguards and the conditions of consequence mitigating features. It also provides for the transmission of followup information to BRP and complies with the criteria of NUREG-0654 in this regard. Chesnut, ff. Tr. 15007, at 43-45; Staff Ex. 6, at 11. Beyond this, the Licensee has established an open, direct line (the "Radiological Line") between TMI and BRP. When this line is activated in an emergency, BRP can request any information it believes to be necessary on plant conditions and the status of the emergency and TMI personnel will provide any such information that is available. Chesnut, ff. Tr. 15007, at 41-45; Tr. 14215 (Tsaggaris). Based on these provisions of the Licensee's Emergency Plan, we find Contention EP-4(E) to be without merit and we reject it.

D. Public Education, Warning, And Emergency Instructions

110. A large number of contentions have been raised and admitted concerning public education, warning and emergency instructions. These contentions are addressed in the following sections.

1. Public Education

111. The Licensee has had an active, ongoing public education and information program involving press releases, media briefings, the TMI-observation center, and public speakers. With the revised Licensee Emergency Plan, however, a new public education and information program is being developed in coordination with the Commonwealth and the five counties in the plume EPZ for TMI. Tr. 14014-15 (Rogay). The NRC Staff has evaluated the Licensee's public education and information program which includes meetings to acquaint and inform government officials and the public of the new siren alerting system being installed by the Licensee, general radiation seminars, briefings on emergency responsibilities, tours of facilities for media personnel, and the distribution of public education and information pamphlets. Based on that evaluation, the Staff has determined that the Licensee's public education and information program will satisfy, and, in fact, go beyond, the criteria of Section II.G of NUREG-0654. Staff Ex. 23, at II-5, II-6. FEMA has evaluated the proposed public education and information programs in the emergency plans of the State and the five counties within the plume EPZ for TMI and has determined that those programs, if implemented, will exceed the requirements of the NRC's planning standard on public education and information (10 CFR §50.47(b)(7)). Staff Ex. 23, at III-10.

112. As to the public education and information programs,

Contention EP-4(C) asserts:

The adoption of the Commonwealth of Pennsylvania Disaster Operations Plan Annex E (DOP) designation of "the 'risk county' as responsible for the preparation and dissemination of information material on protective actions to the general public" (p. 6-8) conflicts with the requirements in EPRG II(A)(7) and RG 1.101 § 6.4(2) to make available on request to occupants in the LPZ information concerning how the emergency plans provide for notification to them and how they can expect to be advised what to do.

At the outset it should be noted that NUREG-0654 criteria stipulate that information should be provided to members of the public within the plume EPZ at least annually on radiation, on how they will be notified in an emergency, on what their actions should be, on protective measures, and on contact points for additional information. These criteria supercede those in EPRG II(A)(7) and Regulatory Guide 1.101 referenced in Contention EP-4(C). Chesnut, ff. Tr. 15007, at 60.

113. The Licensee has a general public information program for the plume EPZ designed to give the public an overview of emergency planning around TMI and to provide specific information on where and how they will be notified of an emergency and what protective actions may be taken. This program is being coordinated with PEMA which, together with the counties and local emergency response organizations, has a program for publishing pertinent emergency planning information in newspapers and distributing

brochures and fact sheets containing emergency preparedness information. Rogan, et al., ff. Tr. 13756, at 99-101.

114. One method of providing information to the public in the plume EPZ is through the distribution of public information pamphlets. Examples of such pamphlets were entered into the record in this proceeding in the form of a pamphlet entitled "What You Should Know About Nuclear Radiation Incidents" (Commonwealth Ex. 3), produced by PCMA, and three pamphlets, produced by the Emergency Management Agencies of Lancaster (Commonwealth Ex. 4), York (Commonwealth Ex. 5), and Dauphin (Commonwealth Ex. 7) Counties. The PCMA pamphlet provides general information, briefly defining a nuclear power plant incident and describing in non-technical terms the hazards of such an incident, the effects of radiation, means for detecting radiation, protective actions that may be taken, and the manner in which additional information may be obtained in a radiological emergency. Commonwealth Ex. 3.^{20/} The county pamphlets,

^{20/} There was substantial controversy in the proceeding over the adequacy of the PCMA pamphlet, particularly with regard to the manner in which the nature and effects of radiation is explained. A physician testifying on behalf of Intervenor ANGRY criticized the pamphlet for its failure to identify cancer and genetic defects as potential harm that can be caused by radiation and for the pamphlet's analogizing nuclear radiation to solar radiation (Tr. 21639 (Ryscavage)). That same witness nevertheless acknowledged that there is additional information in the pamphlet that certainly suggests that radiation presents dangers different from those presented by the sun. Tr. 21653-54 (Ryscavage). A FEMA witness,

which are all similar in format, provide information on how the public will be notified of an emergency, how to obtain emergency instructions, what to do if sheltering or evacuation is ordered, and how to prepare for an evacuation. These pamphlets also contain specific evacuation route instructions and evacuation maps. Commonwealth Ex. 4, 5, 7.

115. The PEMA pamphlet and pamphlets for all five counties in the plume EPZ for TMI were evaluated by FEMA for completeness of emergency information that is to be provided under the criteria of NUREG-0654. FEMA determined that neither the PEMA pamphlet alone nor the individual county pamphlets alone provides the necessary information but that together they provide the information called for by NUREG-0654 criteria. Tr. 18981-82 (Bath); Tr. 18983-84 (Adler). Since it is clear from a reading of the pamphlets that the PEMA document, together with any individual county pamphlet, provide the information on radiation, manner of notification in an emergency, protective actions, and the manner in which additional

(for note 20 continued)

on the other hand, expressed the view that the radiation-sun analogy was not misleading or untruthful but served a useful purpose in putting radiation into a frame of reference understandable to a layman. Tr. 19415-17 (Pawlowski).

We have, ourselves, examined the PEMA pamphlet and find that it is not biased or misleading and that it provides useful information expressed in terms that should be understandable to the general public.

information may be obtained, we find that distribution of the PEMA pamphlet and the appropriate county pamphlets^{21/} will essentially satisfy the criteria of NUREG-0654, §G.1.

116. The PEMA pamphlet was distributed in September 1979 to households within approximately 10 miles of TMI (Tr. 18064-65 (Comey); Tr. 14014, 14016, 14023 (Giangi); Tr. 14138-39 (Giangi)) and the York County pamphlet was distributed to households in the plume EPZ portion of York County. Tr. 20799, 20927 (Curry). However, the Licensee has committed to print the State and County pamphlets and distribute them to the public within the TMI plume EPZ with a target date for completion of distribution of September 1, 1981. Tr. 22878-79 (Chesnut) and Staff Ex. 23, at II-4, II-5. We find that the Licensee's commitment in this regard will assure that the necessary emergency preparedness information is disseminated to the public in accordance with the criteria of NUREG-0654. Accordingly we reject Contention EP-4(C).

117. Contention EP-14(Q) states:

Annex E of the York County Plan, Subsection III, provides that the local Emergency Management Directors are responsible for the distribution of printed handout material to the populace within their respective municipalities. The Plan is defective in this area in that there is no set timetable for the distribution of said materials to the local Emergency Management Directors, and, likewise, there are no provisions within the Plan as to how local Emergency Management Directors

^{21/} The Dauphin County pamphlet (Commonwealth Ex. 7) is not in consonance with the revised Dauphin County Emergency Plan and will be modified to reflect current planning. 20961-62 (Wertz).

are going to distribute the information to the local populace. Again, it is submitted that, in the event of an incident at the TMI nuclear facility, local volunteers will not be able to be counted upon to effect such distribution and that without some other means of distributing the materials, local Emergency Management Directors will be impotent to effect such a Plan. The same problem arises in Section K of this area in that the Public Information Officer is responsible for the posting in all public areas, parks, etc., of public information and evacuation instructions for transient populations.

At the outset, requirements and criteria for public education relate to programs to be carried out prior to an accident, not after one occurs. To the extent that this contention implies that distribution of educational materials is to be accomplished during the course of an emergency, it misconstrues the public education needs. Chesnut and Bath ff. Tr. 19626, at 9.

- 11d. As to the dissemination, prior to an emergency, of emergency preparedness information, we earlier found that the York County Pamphlet (Commonwealth Ex. 5) was distributed to households in the plume EPZ portion of York County. Such distribution was made by the municipalities in tax notices. Tr. 20799 (Curry). In addition, as previously indicated, the Licensee will shortly undertake to distribute both the PEMA and appropriate county pamphlets throughout the TMI plume EPZ, including that portion of the EPZ in York County. Thus, emergency preparedness information has been and will continue to be properly distributed in York County despite the lack of

provisions in the York County Emergency Plan explicitly setting forth a timetable^{22/} for distribution of the materials or specific methods by which they are to be distributed.

There is no evidence indicating that such specific details need be explicitly addressed in an emergency plan. Rather, the evidence indicates that emergency preparedness information materials have been and will be successfully distributed without such detail set out in the York County Emergency Plan.

119. As to posting of emergency information in transient areas, York County no longer plans on using this method for providing information to transients. Instead, emergency preparedness information brochures will be predistributed to motels, hotels, area employers and park managers. In the event of an emergency, the managers of such hotels, motels, parks and the like are to distribute the emergency information materials to transients within their charge. Bath (Attachment 3), ff. Tr. 22350, at 2; Tr. 22374-75 (Bath). While the evidence indicates that specific planning by the managers of transient areas such as hotels and motels is not yet in place (Tr. 22374-75 (Bath)), the York County emergency management coordinator is taking action to inform transient area managers

^{22/} The York County Emergency Plan does, in fact, provide for the annual updating of pre-emergency public information. Board Ex. 5, p. F-2, § IV.A.

of their responsibilities for distributing emergency information materials to transients. Bath (Attachment 3), ff. Tr. 22350, at 2. We find that this method of distribution of information to transients planned by York County is adequate (Tr. 22375 (Bath)) and that Contention EP-14(Q) is without merit in this regard.

120. Again with regard to York County, Contention EP-14(C), in part, states:

The York County Plan in Section VI, Subsection (c) provides that posting of evacuation maps and semi-annual distribution of evacuation routes in local newspapers will be accomplished. It is submitted that there is no set designation of the responsibility for the effecting of this part of the Plan and it is Intervenor's contention that unless the Plan directs and places responsibility upon someone to effect this part of the Plan, the Plan is defective.

Contrary to the assertion in this contention, the York County Emergency Management Coordinator is, in fact, responsible for the coordination of distribution and dissemination of pre-emergency information in York County. Curry et al., ff. Tr. 20787, Curry Testimony at 3. York County will not post such information for transients but will provide the information in the form of brochures and information sheets to hotels, motels, parks and other transient areas. Bath (Attachment 3), ff. Tr. 22350, at 2. The responsibility for distributing such information to transients has been explicitly assigned to the risk municipality emergency management coordinators. Board Ex. 5, at F2, §IV.B; Curry et al. ff. Tr. 20787, Curry Testimony at 3.

121. While it is, indeed, true that the York County Emergency Plan does not specifically assign responsibility for the semi-annual publishing of evacuation routes in local newspapers, we find that this is not a defect or inadequacy in the plan. The evidence shows that the York County Emergency Management Coordinator caused copies of the York County evacuation route maps and basic emergency instructions to be published in the York Dispatch, the largest circulation newspaper in York County. In addition, notice of the distribution of the county emergency information pamphlets was published in the York Daily Record. Curry et al., ff. Tr. 20787, Curry Testimony at 3; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 10. Thus, the distribution of evacuation maps in local newspapers has been accomplished despite the fact that the responsibility for such action is not explicitly and specifically assigned in the York County Emergency Plan.
122. Based on the foregoing, we find that there is an adequate assignment of responsibility for the dissemination of pre-emergency information in the York County Emergency Plan and that the portion of Contention EP-14(C) asserting to the contrary is without merit.

2. Warning

123. Section 50.47(b)(5) of 10 CFR requires, in part, that means to provide early notification to the populace within the plume EPZ be established. Part 50, Appendix E, §D.3 of 10 CFR requires that

licensees demonstrate that the physical and administrative means are established for promptly alerting the public within the plume EPZ, with a design objective to have the capability for essentially completing initial alerting within 15 minutes of the decision to alert. To comply with these requirements, the Licensee proposes to install a network of sirens throughout the plume EPZ for TMI. The siren system design is based on site specific sound studies and engineering studies accounting for local topography and population density.

Rogan et al., ff. Tr. 13756, at 101-102; Tr. 13761 (Giangi). The system is designed to provide a minimum of 10 dB over ambient sound levels, providing a 60 dB signal for areas where the population density is less than 2000 persons per square mile and a 70 dB signal for areas where the population density is greater than 2000 persons per square mile. Tr. 13909-910 (Rogan). Through the placement and sound levels of the sirens, the system is designed to provide full coverage of the plume EPZ. Tr. 13761 (Giangi).

124. The siren system itself consists of 83 sirens distributed throughout the plume EPZ. The sirens will be radio-activated from the risk county EOCs. Licensee will supply to the counties the radio transmission equipment needed for activation of the sirens and that control equipment will be compatible with the existing siren systems in the counties. Staff Ex. 23, at II-1, II-2.

125. The Staff has reviewed a theoretical sound coverage analysis of the siren system provided by the Licensee. Based on that review, the Staff has determined that the assumptions used in the design of the system for ambient noise levels and siren range are consistent with the criteria in NUREG-0654, Appendix 3 (on which the adequacy of the siren system is to be judged, Tr. 15455 (Grimes)) and that the design of the siren system is adequate and meets the criteria for coverage of the plume EPZ. Tr. 22889, 22894-95 (Chesnut).^{23/} There is no evidence of record to the contrary.

126. The Licensee has been working to install the new siren system and the completion date for installation is estimated to be in late July or early August 1981. Tr. 22887 (Chesnut). For each siren, once installed, the Licensee will conduct a separate startup and test program to confirm the operability of both the radio-control equipment that activates the siren and the siren itself. In addition, an acoustical expert will sample selected siren sites for sound level to confirm the Licensee's original sound study and full sound coverage of the plume EPZ. Tr. 22904-05, 22907 (Rogan). On turning over the siren system to the counties, the Licensee will perform a silent

^{23/} FEMA is also of the view that the siren system design is adequate. Tr. 22686 (Dickey).

test of the sirens from each county EOC to identify any sirens which are not functioning properly. Tr. 22908-09 (Rogan).^{24/}

We find that the testing to be performed by the Licensee will assure that the siren system has been properly installed and will operate as intended.

127. From the evidence of record we find that there is reasonable assurance that the Licensee's siren system, once installed, will provide the means for promptly alerting essentially 100% of the populace within the plume EPZ for TMI. Without that siren system, the means for prompt alerting for the populace throughout the TMI plume EPZ would not be adequate. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 19; Staff Ex. 6, at 12. Since adequate prompt alerting of the public within the plume EPZ is critically dependent upon completion of the Licensee's siren system, the Staff has recommended the imposition of a condition on any authorization of restart that the Licensee's prompt alerting system be completed. Staff Position ff. Tr. 22881. We agree that such a condition should be imposed.

128. A number of contentions have challenged the means for providing prompt alerting to the public within the TMI plume EPZ. Among those is Contention EP-5(D) which states:

1. The physical means to provide warning to all persons within the plume EPZ in a manner conforming to the standards set forth in N. 0654 Sec. E6 (and App. 3 referenced therein) and in the Pa. DOP App. 13, Sec. IIIA(6) should exist before TMI-1 is allowed to restart.
2. The Commonwealth's DOP fails to identify the time required to alert the public within the plume EPZ

24/ The siren system will be maintained by the Licensee after it is turned over to the counties. Tr. 22909-910 (Rogan).

under present circumstances as required by the aforementioned provision of N. 0654. Such estimates as the Commonwealth has provided elsewhere are founded upon a totally inadequate data base and are thus not credible. Although the Pa. DOP App. 13, Sec. IID states that "the primary means of emergency warning is outdoor siren systems", the York County plan reveals that less than 1/2 of the population in York County within 10 miles of TMI are capable of being warned by sirens (Annex C). Information as to the time required for implementation of "back-up" notification measures of mobile "public address systems" and "knocking on doors" (Annex G, App. 1) is to be provided in local emergency plans which do not as yet exist.

As to part (1) of this contention, we have found that the siren system being installed by the Licensee will provide the physical means for alerting the populace within the plume EPZ, and have determined that a condition to restart should be the completion of the siren system. Thus, Contention EP-5(D)(1) is satisfied.

129. As to part (2) of this contention, the evidence indicates that the Licensee's siren alert system is designed to exceed the criteria of Appendix 3 to NUREG-0654 and should not require substantial reliance on emergency workers to provide supplementary alerting within the plume EPZ. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 14, at 15-16. Activation of the sirens should provide an alert for essentially all of the populace within the plume EPZ. PEMA will advise the counties as to when to activate the sirens (Tr. 17874 (Lamison)) and will coordinate siren activation within the five risk counties

(Tr. 20899-900 (Belser)). In view of this coordination and of the fact that the sirens are activated by radio remote control from each county EOC (Tr. 13915 (Rogan)), there is no reason to believe that the sirens cannot be activated within 15 minutes of the decision to alert in accordance with the design objectives for prompt alerting systems. We find that once the Licensee's siren system is installed, the capability for prompt alerting within 15 minutes of a decision to alert will exist and that the lack of an explicit identification in the Commonwealth's Emergency Plan of the time required to alert the public is not a defect. Thus we conclude that Contention EP-5(D)(2) is without merit and we reject it.

130. Three admitted contentions challenge the adequacy of the population warning system for York County. These contentions, EP-14(U), EP-14(T) and EP-14(A) state:

14(O). Annex C of the York County Plan is deficient in that its total concept of operations is based upon tone-coded siren control and that nowhere in the Plan is it stated that all individuals are within hearing distance of the sirens located within a 20-mile radius of the TMI nuclear plant. Moreover, the plan provides as a backup or supplementary system to the siren system that police and fire vehicles would travel throughout the communities and again it is raised that the townships, boroughs and municipalities located within the 20-mile radius of the TMI nuclear facility do not have the necessary commitments of manpower to effect such a plan. Therefore, it is Intervenor's position that the York County Plan

remains deficient.^{25/}

14(T). Appendix I of the York County Plan regarding warning is deficient in that it assumes that local fire companies will be able to alert all members of a rural community by direct notification such as knocking on doors. There is absolutely no conceivable way in which individual direct notification can be made in Newberry Township because of the number of residents versus the number of volunteer firemen and it is submitted that the same conditions exist in all local municipalities located within the 20-mile radius of the TMI nuclear facility. Therefore, until and unless a system is designed that can adequately ensure that a substantial majority of the population can be notified of an incident at TMI, the Plan is deficient.

14(A). Section VI, Concept of Operations, Subsection 7(a) is deficient in that there is an assumption that notification by siren can be heard throughout Newberry Township and surrounding communities. It is questionable at best whether this is, in fact, true in that at least in the York County Plan there is an assumption of one Civil Defense siren being in place in Newberry Township which does not exist. Oversights such as this may still exist within the Emergency Plan drafted by York County and verification of all sirens must be required in order to ensure at least minimum siren coverage of the county. Therefore, it is Intervenor's position that there are not sufficient numbers of Civil Defense warning sirens in place in the county in order to adequately ensure that all members of the community are within hearing distance of a siren. It is Intervenor's contention that until the Emergency Plan specifically states that a siren alert system is in place and that the warning emitted by the system can be heard at any point in the county surrounding the plant site, that the Emergency Plan as drafted is unacceptable.

^{25/} The reference in this contention to alerting individuals within a 20 mile radius of TMI is inconsistent with emergency planning requirements and with existing planning for York County. 10 CFR § 50.47(b)(5) requires that means be provided for the early notification of the public "within the plume exposure pathway Emergency Planning Zone." 10 CFR §§ 50.47(c)(2) and 50.54(s)(1) generally define the plume EPZ for a nuclear plant as "an area of about 10 miles . . . in radius." Insofar as Contention EP-14(0) may be inferred to assert that means are required for promptly alerting the public within 20 miles of TMI, we reject such assertion. The York County Emergency Plan addresses the matter of prompt alerting within the plume EPZ in York County (Board Ex. 5, p. B-2) and is consistent with the cited regulations in this regard.

Each of these contentions obviously was formulated prior to the time that the Licensee proposed and began installing its siren system. We have previously found that, once installed, that siren system will provide essentially full coverage of the plume EPZ, and this finding extends to the portion of the plume EPZ in York County. Although the York County Emergency Plan does provide for backup or supplementary alerting by police and fire vehicles (Board Ex. 5, p. B-2, §§ IV D, E), the evidence shows that, with the Licensee's siren system, the need for such supplementary alerting will be reduced to a minimum. Adler and Bath (3/15 Testimony), ff. Tr. 18975, at 14. There is no evidence indicating that substantial supplementary alerting by police or fire personnel will be needed with the Licensee's siren system and, in fact, the evidence is to the contrary. Adler and Bath (3/15 Testimony), ff. Tr. 18975, at 15-16. Accordingly, with the installation of the Licensee's siren system, we find Contentions EP-14(O), EP-14(T) and EP-14(A) to be without merit.

131. We similarly reject Contention EP-16(E) which states:

Appendix 5 of the Dauphin County Plan provides that alert warnings will be initiated through siren activation. Again, this part of the Plan makes a broad base assumption that the populace within the county can hear the sirens at all locations and it is Intervenor's position that this is not true. Therefore, until and unless a sufficient number of sirens are placed throughout the county area at locations that will ensure that the total populace of the county is within hearing distance of the sirens, the Plan will remain deficient.

As with the previous contentions directed to York County, we have found that the Licensee's siren system will provide sound coverage for essentially all of the plume EPZ for TMI,

including that portion of the plume EPZ which is in Dauphin County. Contention EP-16(E) is, thus, without merit.

132. Contention EP-14(B) states:

Section VI, Subsection 7(b). The York County Plan as drafted indicates that selective evacuation of pregnant women and pre-school children and their families would be effected upon order of the Governor. Again, the notification would be by a five (5) minute steady siren which cannot be assured will be heard in all points within the affected areas. Moreover, the Plan assumes that there will be appropriate EBS announcements followed by door-to-door notification which would be conducted by appropriate boroughs and townships. Again, the Intervenor raises the contention that the time factor required in order to recruit volunteers to man vehicles and the many miles of road which are located in the various rural communities which would have to be traveled in order to ensure that notification of all members of the population of the impending emergency conditions would render the Plan as written inoperable. Moreover, it is contended by the Intervenor that the selected evacuation notification is initially effected by the same type of notification that would be required in a general evacuation. Both evacuations are initiated by a five (5) minute steady siren tone, then followed by appropriate EBS announcements. It is Intervenor's contention that similarity and warning evacuation tones may lead to confusion on behalf of the public and that orderly evacuation of the affected areas could not be effected.

This contention alleges the same inadequacies in York County's prompt alerting provision with regard to the ability of the populace to hear sirens and the need for supplementary, door-to-door alerting as were raised in Contentions EP-14(O), EP-14(T) and EP-14(A). We have previously addressed such allegations and found them to be without merit.

133. Contention EP-14(B) also alleges that the siren signals to be used for both a selective and a general evacuation in York County are similar and will confuse the public. A similar assertion is made in Contention EP-16(M) which states, in part:

The Dauphin County Plan does not specifically state a differentiated commonly recognized evacuation signal that could be recognized by the citizenry throughout the county.

Under both the York County and Dauphin County Emergency Plans, the only siren signal to be used for a fixed nuclear facility accident is the "attention-alert" signal which is a three to five minute siren blast. Board Ex. 5, at B-1, §IV.C; Board Ex. 6, at C-1, §IV.B; Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 21. The nuclear emergency signal is differentiated from other siren signals, such as fire signals, by the length of the siren blast. Tr. 20820 (Curry). This signal has only one meaning, regardless of how many times it is sounded, and that is that members of the public, upon hearing the signal, are to turn on their radios or televisions to receive a message and information from government authorities.^{26/} There will not be different siren signals for different protective actions but a single signal -- the three-to-five minute siren

^{26/} Both the Dauphin County emergency information pamphlet (Commonwealth Ex. 7) and the York County pamphlet (Commonwealth Ex. 6) indicate that the public will be alerted to an emergency at TMI by a three-to-five minute siren blast and that persons should turn on their radios and tune to the EBS station in their county. Distribution of the county pamphlets to be made by the Licensee will assure that residents of Dauphin and York Counties will be made aware of the meaning of the sirens and what their actions should be when they hear them.

blast. Specific information on the emergency and specific instructions on protective actions will then be provided over the EBS. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 21-22. In view of this, the nuclear emergency siren signal should not be confusing and we find those portions of contentions EP-14(B) and EP-16(M) alleging inadequacies in the planned siren signal for nuclear emergencies to be without merit.

134. Contention 16-(M) also asserts, in part, that:

The [Dauphin County] Plan does not indicate whether the alarm system that is to be used is to be driven by a regular power system and if the source was terminated, whether the system would still work. The Plan does not indicate whether all areas within the county are within hearing distance of the sirens. Such deficiencies render the Emergency Plan inadequate.

We have previously addressed the allegations about the siren coverage for the Dauphin County portion of the plume EPZ and have found them to be without merit. As to the power supply for the Licensee's siren system, the system is operated from normal commercial power sources. There are no regulatory requirements that prompt alerting systems have backup power sources. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 22. The bases for not requiring backup power are the low likelihood of the occurrence of a nuclear facility incident coincident with loss of power to the sirens and the fact that the types of nuclear facility accidents which are initiated by loss of offsite power are generally slow in developing, thereby providing time to procure other means of notification or to

restore power to the siren system. Tr. 15253-54 (Grimes). The Licensee has studied the power grid in the TMI area and has concluded that there is no way that the loss of offsite power to TMI would render the Licensee's siren alert system inoperative. Tr. 14286-87 (Rogan). Commercial power for sirens is considered to be dependable as evidenced by the fact that fire sirens and nuclear attack outdoor warning systems throughout the United States are not provided with backup emergency power sources. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 22-23. In general, then, the evidence tends to indicate that commercial power for the prompt alerting system will be dependable and that there is no need for a backup power source for such system. Based on that evidence, we reject that portion of Contention EP-16(M) related to the power source for sirens.

3. Emergency Instructions to the Public

(a) Concept of Operations

135. Contention EP-14(Y) states:

Annex N, Subsection VII, Subsection G provides for certain duties and responsibilities for a County Director and these duties and responsibilities conflict directly with those of the Emergency Management Coordinator. Specifically, this section provides that the County Director shall provide appropriate notice of information received and emergency actions taken and proposed to the York County Police and Fire Departments, other echelons and emergency operational chains, and local news media for emergency public information and news announcements, whereas, Appendix II provides that the Public Information Officer is responsible for the issuance of official information, advice and instructions

from the county to the public. This conflict renders the Plan deficient.

At the outset, it should be noted that for York County, the "County Director" and the County "Emergency Management Coordinator" are one and the same person and the two titles refer to the same position. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 16-17. Thus, responsibilities assigned to the County Director and the County Emergency Management Coordinator are not conflicting and the York County Emergency Plan is not deficient in this regard.

136. The revised York County Emergency Plan assigns specific duties and responsibilities for disseminating emergency information to both the County Emergency Management Coordinator (EMC) and the County Public Information Officer (PIO) and those assignments of responsibilities do not appear to be in conflict. The PIO, assisted by PEMA, is to prepare and update "canned" messages for broadcast over the EBS. Board Ex. 5, at F-2, § IV.D. When an emergency occurs, the EMC, at the direction of the County Commissioners, is to release the pre-prepared or "canned" EBS messages for broadcast. Board Ex. 5, at F-2, § IV.E. For contact with the news media, the PIO is to serve as the County's spokesperson. Board Ex. 5, at 18, at F-3, § IV.G. The issuance of EBS emergency information and protective action instructions by the County EMC does not conflict with the PIO's responsibility for providing general information on the emergency through non-EBS media sources. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 17.

From the clear provisions of the York County Emergency Plan we find that the conflicts of responsibilities alleged in Contention EP-14(Y) do not exist.

137. Contention EP-14(C) states, in part:

Section VI, Subsection 7(c). This section of the York County Plan is deficient in that it depends upon the York County Chamber of Commerce to notify and pass on the general evacuation information to business and industry. There is no assurance that the Chamber of Commerce has the necessary manpower, equipment, and training to pass on such information to the general public. For example, does the York County Chamber of Commerce possess necessary trunk lines to advise all industry within an affected area? What happens in the event that telephone communications are jammed or overloaded and that notification of industries cannot be effected by the York County Chamber of Commerce? Furthermore, does the York County Chamber of Commerce and all industry within the possible affected area have radio communication capabilities?

Under earlier versions of the York County Emergency Plan, the York Area Chamber of Commerce was relied upon for supplementary notification of business and industry through a telephone "fan-out" service using commercial telephones. Such supplementary notification support by the Chamber of Commerce was necessary only until a siren system meeting the criteria of NUREG-0654, Appendix 3 was in place. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 11-12; Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 20. The revised York County Emergency Plan, while containing a letter of agreement from the Chamber of Commerce indicating the Chamber of Commerce's willingness to provide assistance in dissemination of emergency information.

(Board Ex. 5, at T-5), places no reliance on the Chamber of Commerce for alerting or notification. (See, e.g. Board Ex. 5, Annex B).^{27/} Consequently, the premise of this contention is incorrect, the contention is not reflective of current planning, and we reject it.

138. Contention EP-1 states, in part:

It is contended that licensee has not made provision for timely dissemination of information in the event of accidental release of airborne radioactive gases or particulates. It is contended that licensee must make information available to the public which will allow appropriate action to be taken to protect persons, livestock, foodstuff and feed in the event of a discharge of significant proportion.

We have previously found that the Licensee has made proper provisions for initial notification of, and transmission of information to, Commonwealth emergency response agencies and the emergency response agencies of the five counties in the plume EPZ for TMI in the event of an emergency. The Licensee does have the capability to promptly notify, and transmit information and protective action recommendations to, government emergency response organizations in accordance with the NRC's emergency planning rules. Chesnut, ff. Tr. 15007, at 57.

^{27/} To the extent that there may be factories with high noise levels and large populations that may have difficulty in hearing the signal from Licensee's sirens, Licensee will make provisions to assure alerting. Tr. 13928-29 (Rogan).

139. We have also determined that the Licensee is installing a prompt alerting system which, when completed, will be capable of alerting the public within the plume EPZ for TMI within about 15 minutes of the time at which the decision to alert the public is made. State and county emergency response organizations will be responsible for determining whether to activate the prompt alerting system and for actually activating it. Chesnut, ff. Tr. 15007, at 54. By means of pre-distribution of the five county emergency information pamphlets, which the Licensee has committed to accomplish prior to restart (Tr. 22878-79 (Chesnut)), members of the public within the plume EPZ will have been informed of the attention alert signal for an emergency at TMI and that, upon hearing that signal, they should turn to their county EBS station for information and instructions.^{28/} After sounding of the sirens, conventional radio and television will be used to transmit information and protective action recommendations to the public on EBS stations. Rogan et al., ff. Tr. 13756, at 102-103. The Commonwealth has agreements with EBS stations to disseminate emergency and for the EBS stations to disseminate emergency information upon request. Tr. 17879-80 (Lamison).

^{28/} See, for example, the emergency information pamphlets for Lancaster (Commonwealth Ex. 4), York (Commonwealth Ex. 5) and Dauphin (Commonwealth Ex. 7) Counties, each of which defines the siren alert signal for a TMI accident and directs the reader to tune to the county EBS station.

140. Though this extensive prearranged system of Licensee notification to governmental organizations, the prompt alerting system and the EBS, there is a mechanism for the timely dissemination of information and protective action instructions to the public in the event of an accident and significant radioactive releases at TMI. Thus, the assertion that provisions have not been made for the timely dissemination of information to the public is not correct and the assertion to that effect in Contention EP-1 is without merit.

(b) Emergency Broadcast System (EBS)

141. With regard to the EBS, over which information and protective action instructions will be transmitted to the public in an emergency, Contention 14-(FF) states:

The York County Plan contains only one EBS station, that being WSBA in York, Pennsylvania, and lists no other secondary station in the event that WSBA loses power or in some other way is placed out of operation. It is Intervenor's contention that the Plan is deficient in that a secondary EBS station is not included in the Plan.

The evidence shows, contrary to the assertion in this contention, that there are, in fact, three EBS stations for York County, one of which is within one city block of the York County EOC. Tr. 20933-34 (Curry). Apart from this, there is no reason to believe that WSPA, which is the primary EBS station for York County, would be unavailable for service in a TMI emergency. The station itself is located outside the plume

EPZ and likely would not need to be evacuated in the event of an emergency. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 23-24. In addition, the station has a backup emergency power source and can continue to operate if normal power is lost. Id. In the event that the county cannot reach WSBA through commercial telephone, the York EOC has, in place, a remote programming radio through which the EBS station can be reached and through which EBS messages can be remotely transmitted from the county EOC for broadcast by WSBA. Tr. 20817-18 (Curry). In view of all of this and of the fact that there are alternate EBS stations for York County, Contention EP-14(FF) is wholly without merit.

(c) 911 Telephone System

142. Contention EP-14(P) states, in part:

Furthermore, Subsection VI of this particular section provides that the common carrier system within the Emergency Operations Center is the 911 system, of which 49 out of 79 emergency telephone trunk lines are committed. Furthermore, 6 of the lines are standby rumor-control lines, leaving 24 emergency telephone trunk lines for those areas not contained within the 911 system. The Newberry Township, Fairview Township, Goldsboro and Lewisberry areas are without 911 service. It is Intervenor's contention that, in the event of an incident at the TMI nuclear facility, the telephone grid system would become so overloaded during such an incident that the making of a phone call to the remaining 24 committed lines at the Emergency Operations Center would be difficult if not impossible. Therefore, it is claimed that this part of the Plan also is deficient in that there are not enough emergency trunk lines available for all residents within the 20-mile radius zone of TMI with a special emphasis on those areas in York County which are closest to the nuclear power facility.

While the thrust of this contention is unclear, it appears that Intervenor's assertion is that there are insufficient telephone lines in the York County Public Safety Communications Network (Board Ex. 5, at C-1, § III.A) to handle calls from the public in the event of an emergency at TMI and that the York County Emergency Plan is, therefore, deficient. At the outset, we see no basis for any requirement that sufficient telephone provisions be made to handle calls from all residents within 20 miles of TMI. The primary means for the public to receive information in an emergency is through EBS broadcasts which should substantially reduce the need for persons to call the York County Emergency Management Agency merely to seek information. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 23.^{29/}

143. In addition, incoming calls from the public should not interfere with communications between and among emergency response organizations since, during an emergency, there are specific dedicated circuits between the York County EOC and between the State and the EOCs in the five risk counties (Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 23) and there are radio networks for communications between the County and municipalities in the York County portion of the plume EPZ (Board Ex. 5, at C-1, § III.B).

^{29/} The York County emergency information pamphlet specifically instructs that emergency information will be provided through local radio stations and that phone lines must be kept open for medical and other emergencies and should not be used. Commonwealth Ex. 5.

144. The evidence indicates that York County has 49 trunk lines and 2 operators serving its 911 system. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 22, 26. These should be sufficient during an emergency as calls exceeding the 911 system capacity will be transferred to six rumor control lines that the county has established. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 26; Tr. 19376-77 (Bath); Tr. 20812 (Curry).
145. In sum, we find that additional 911 telephone lines are not needed in York County for providing information to the public, for assuring adequate communications among emergency response organizations, or for providing emergency services contact points for the public during an emergency. There is no evidence of record indicating a need for additional telephone provisions for York County and, accordingly, we find the assertions of Contention EP-14(P) to the contrary to be without merit.
146. Similar to Contention EP-14(P), but directed to Dauphin County, Contention EP-16(Q) states:

The Dauphin County Plan lists only two (2) 911 operators in place in the event of an evacuation. It is submitted that two operators are grossly insufficient when it is taken into consideration that the York County Plan incorporates forty-nine (49) 911 operators in order to deal with an evacuation. Until and unless there is a commitment for more 911 operators to be in place during an emergency, the Dauphin County Plan remains deficient.

Similar to the situation in York County, Dauphin County has 40 telephone trunk lines and two operators serving its 911 system.

Curry et al., ff. Tr. 20787, Wertz Testimony at 3. As with York County, we find no basis for concluding that the Dauphin County 911 system will be used by members of the public simply as a source from which to obtain information.^{30/} Dauphin County maintains an extensive radio communications network with the other four counties in the plume EPZ for TMI and with Dauphin County municipalities (Board Ex. 6, at B-2, § III.B) so that it need not rely on telephone communications for contact with other emergency response organizations during a TMI emergency. Finally, the evidence indicates that the two 911 operators provided by Dauphin County will be adequate in an emergency as calls exceeding the 911 system capacity will be transferred to county rumor control lines for disposition. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 26. In sum, we find that additional 911 system operators are not needed in Dauphin County for providing information to the public, for assuring adequate communications among emergency response organizations or for providing emergency services contact points for the public during an emergency. There is no evidence of record indicating a need for additional 911 system provisions for Dauphin County and, accordingly, we find the assertions of Contention EP-16(Q) to the contrary to be without merit.

^{30/} The Dauphin County pamphlet contains instructions to the effect that, in the event of an emergency at TMI, information is to be obtained from the local radio stations and telephones are not to be used. Commonwealth Ex. 7.

(d) News Releases

147. With regard to the matter of State news releases during an emergency, Contention EP-12 states:

ECNP contends that the routing of all information through the Governor's Press Secretary to the public adds unnecessary complexities to the entire plan. For example, since the Press Secretary of the Governor can reasonably be expected to be a political appointee and not necessarily knowledgeable at all in the area of nuclear accidents and their consequences, or the nature of radiation injury, the designation of the Governor's Press Secretary as the official and sole spokesperson adds one more pathway for and perhaps impediment to information in the cumbersome and circuitous route between an event or accident at TMI and the public. There is no need for this extra step. In addition, this extra step offers one more opportunity for errors and omissions to be introduced into the information and only adds further delay. It is not expected that this extra step will result in the removal of errors from the messages. Furthermore, the possibility exists, with this extra, unnecessary step, for political pressure to be brought to bear to alter, delay, or even withhold crucial information from the public.

Under the Commonwealth's Emergency Plan, the Governor's Press Secretary is assigned the responsibility to establish policy and procedure for the state government public information program. The Governor's Press Secretary has delegated the responsibility of coordinating public information in an emergency and the role of state spokesperson in an emergency to PEMA. *Comey*, ff. Tr. 18039; Commonwealth Ex. 2A, at 15-1, § II.B, 15-4, § C. The evidence shows that for purposes of alerting the public and providing emergency instructions on protective actions, the Governor's Press Secretary (in actuality, his designee, the PEMA spokesperson) will not play a critical role because those functions are performed by other means. *Adler and Bath (2/23 Testimony)*, ff. Tr. 18975, at 25; Commonwealth Ex. 2A, at 15-3, §§ V.A.1. 2.a.

148. In any event, the PEMA spokesperson will be located at the media center adjacent to the State EOC. This is the best location for him to be briefed by knowledgeable State personnel, to be kept advised of all events, and to be informed of the status of State preparedness, of county preparedness of the policy and concerns of the Governor. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 25-26; Tr. 18054 (Corney). The Commonwealth's Emergency Plan provides that the PEMA spokesperson will exchange information on a regular basis with the spokespersons of all principal emergency response organizations (Commonwealth Ex. 2A, at 15-4, § V.C.4) and provision has been made for coordination between the Licensee and the State to minimize the potential for conflicts in public information provided by the Licensee and the State. Tr. 18057 (Corney).
149. From the provisions outlined, we see no basis for concluding that designation of the PEMA spokesperson as the sole spokesperson for the State would be an impediment to providing information to the public. Such designation is in accordance with the guidance of NUREG-0654, Criterion G.4.a which stipulates that the state is to designate a spokesperson who would have access to all necessary information. Staff Ex. 7, at 50. That access is provided by the location of the PEMA spokesperson adjacent to the State EOC and should assure that

errors in information received and delay in the receipt of information are minimized. Finally, we find no evidentiary support for the assertion in Contention EP-12 that the designated state spokesperson may be subject to political pressure to alter, delay or withhold crucial information from the public.

150. In sum, we find the Commonwealth's provisions for the State spokesperson in an emergency to be adequate and to be sufficient to allow the timely dissemination of accurate information to the public. Consequently, we reject Contention EP-12.

E. Definition of EPZs

151. Section 50.47(b)(10) of 10 CFR requires that a range of actions be developed to protect the public in an area surrounding nuclear power plants designated as the plume exposure pathway EPZ. This regulation also requires that protective actions appropriate to the locale be developed for an area surrounding plants designated as the ingestion exposure pathway EPZ with plans for the ingestion EPZ to focus on protecting the food ingestion pathway (10 CFR § 50.54(s)(1)). The plume EPZ is to consist of an area about 10 miles in radius and the ingestion EPZ is to be about 50 miles in radius with the exact size and configuration of each EPZ determined based on local emergency response needs and capabilities as they are affected by demography, topography, land characteristics, access routes

and jurisdictional boundaries. 10 CFR § 50.54(s)(1). Plume and ingestion EPZs have been developed and defined for TMI. Commonwealth Ex. 2A, Appendix 1, at 1-1 to 1-3; Commonwealth Ex. 2B.

152. The adequacy of the plume EPZ for TMI is challenged in several respects in Contention EP-17(A). Part (1) of Contention EP-17(A) states:

Licensee's acceptance, without formal analysis or evaluation, of a circular 10-mile radius for the Plume Exposure Emergency Planning Zone (as designated by the Pennsylvania Emergency Management Agency) does not discharge Licensee's responsibility to ensure that adequate emergency response plans exist to protect the public health and safety in the event of an emergency at TMI-1. Further, acceptance of or designation of a circular 10-mile radius Plume Exposure EPZ for TMI-1 is unjustified because such an EPZ fails to adequately consider local emergency response needs and capabilities as they are affected by demography and jurisdictional boundaries. These considerations, among others, are specified in NUREG-0396, NUREG-0654, and the new emergency planning rule published in the Federal Register on August 19, 1980. The following specific local conditions should be reflected in the Plume Exposure EPZ for TMI-1:

1. The proposed 10-mile radius circular EPZ includes within the EPZ portions of numerous jurisdictions at the township, city, borough, and town levels of government. Calling for an evacuation of only a portion of any political jurisdiction due to a hazard which affects a large geographic area and basing emergency plans and response capabilities on such a limited evacuation will lead to problems due to spontaneous evacuation of a much larger area, with a concomitant increase in traffic and supply requirements at shelters. Therefore, the Plume Exposure EPZ for TMI-1 should include the entire geographic extent of all governmental jurisdictions at the township, city, borough, and town level which are bisected by the proposed circular 10-mile EPZ.

At the outset, we note that, contrary to the assertion in this contention that the plume EPZ designated by PEMA is an area enclosed by a circle 10 miles in radius, the TMI plume EPZ is very roughly 10 miles in radius but has boundaries that are irregular in shape and, in most instances, extend beyond 10 miles from TMI, in some locations by a mile or more.

Commonwealth Ex. 2B.

153. An examination of the plume EPZ boundaries for TMI reveals that those boundaries have been extended to include the whole of Derry Township, South Hanover Township, Fairview Township and Conewago Township, each of which is intersected by a 10-mile radius circle. Rogan et al., ff. Tr. 13756, at 108, Commonwealth Ex. 2B. The same examination also reveals that in every instance in which the EPZ boundary was not extended to include entire municipalities, the boundaries were established at roads or highways. Commonwealth Ex. 2B. In this way, the plume EPZ boundary in any particular location is a clearly defined marker known to area residents. Rogan et al., ff. Tr. 13756, at 108. The use of natural or jurisdictional boundaries for the plume EPZ boundary is important for planning purposes because it will minimize confusion by persons who are unsure as to whether they are located in zones where protective actions have been ordered. Chesnut, ff. Tr. 15007, at 65-66. While the designated plume EPZ boundaries do not include the whole of all municipalities intersected by a

10-mile radius circle, the evidence shows that the boundaries do coincide with jurisdictional boundaries, natural geographic features, roads and other readily identifiable landmarks. Rogan et al., ff. Tr. 13756, at 98-99; Chesnut, ff. Tr. 15007, at 65-66. Accordingly, we find that the plume EPZ boundaries for TMI were established based on considerations of topography, access routes and jurisdictional boundaries. Beyond this, we find no evidentiary basis for requiring that every municipality bisected by a circle of 10 mile radius from TMI be included within the plume EPZ for TMI. Thus, Contention EP 17(A)(1) is rejected.

154. Part (2) of Contention EP-17(.) states:

There are heavily populated areas in and near the cities of Harrisburg and York represented by the city proper and adjacent continuation of the urban areas into the suburbs. In the event that the wind is blowing toward either of these areas when a large release of radioactivity occurs, such areas would constitute a large percentage of the total population dose (in the case of the TMI-2 accident, for instance, Harrisburg contributed 25% of the total population dose despite the fact that most of the city is more than 10 miles distant from the plant). The urbanized areas in and around Harrisburg and York are concentrations of population for which preplanning for an evacuation is a necessity for successful implementation (for instance, preplanning would have to include evacuation routes, transportation needs, host area requirements, and problems posed by special populations such as prisons). Therefore, the urbanized areas around and including the cities of Harrisburg and York should be included within the Plume Exposure EPZ for TMI-1.

While the urbanized areas around York have not been included in the plume EPZ for TMI, a significant portion of the heavily urbanized area in and around Harrisburg has been included

within the plume EPZ. Commonwealth Ex. 2B. Inclusion of such areas beyond 10 miles from TMI has resulted in a population within the defined plume EPZ which is about 30% greater than the population within a 10-mile circle around the TMI site. Rogan et al., ff. Tr. 13756, at 98-99. Emergency planning and preparation for protective actions encompasses all areas within the defined plume EPZ.

155. The plume EPZ for TMI was defined by PEMA. That agency, responsible for assuring emergency preparedness for the Commonwealth, judged that not all urbanized areas around Harrisburg and York need be included in the plume EPZ to assure an adequate emergency response capability. Rogan et al., ff. Tr. 13756, at 109. We find no evidentiary basis for disagreeing with that judgment. The evidence indicates that in the case of adverse meteorology, with stable dispersion characteristics and low wind speeds and, therefore, the potential for higher offsite doses, the Harrisburg and York areas not included within the plume EPZ will have from five to eight hours additional warning time relative to areas close-in to TMI. Given the substantial preplanning within the plume EPZ, this additional warning time should be adequate to allow residents in those areas of Harrisburg and York not

included in the EPZ to take necessary protective actions. Rogan et al., ff. Tr. 13756, at 109-10.^{31/} On the other hand, if weather conditions are unstable and plume travel time is fast, the offsite dose is likely to be smaller and the need for protective actions less (Rogan et al., ff. Tr. 13756, p. 10) particularly in view of the distance of Harrisburg and York from TMI. There is no evidence that the urbanized areas around York and Harrisburg not now included in the TMI plume should be included. Accordingly, we reject Contention EP 17(A)(2).

156. Part (3) of Contention EP-17(A) states:

Numerous members of the Old Order Amish community reside in relatively close proximity (within 10 miles) of the outer boundary of the Licensee's Plume Exposure EPZ in Lancaster County. Because the Old Order Amish eschew the use of electricity, telephones, and automobiles, they present unique problems with respect to warning, communication of protective action advisories, and transportation. These unique problems warrant the special consideration the inclusion of Old Order Amish within the Plume Exposure EPZ would provide.

The existence of Old Order Amish in the vicinity of TMI raises special concerns with regard to emergency planning and response. There are eight Old Order Amish families, consisting of 56 persons, within the plume EPZ for TMI. Within 20 miles of TMI

^{31/} Detailed planning within a plume EPZ will provide a substantial base for expanding response efforts beyond the plume EPZ if that proves to be necessary. Staff Ex. 7, at 12.

there are a total of 32 Old Order Amish families totalling 224 persons who require special consideration. Tr. 18288 (Lothrop).

157. Special emergency actions for these Old Order Amish will be provided by the Mennonite Disaster Services (MDS). The MDS has its own system for providing emergency information to the Old Order Amish and a written outline, developed during the TMI-2 accident, describing MDS evacuation capabilities. Tr. 18291 (Lothrop). PEMA has, in the PEMA duty officer manual, work and home telephone contact points for key personnel and alternates in the MDS. Tr. 18289-90 (Lothrop); Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 62.^{32/} During an actual emergency, a representative of the MDS would be stationed in the EOC. Bath (Attachment 3), ff. Tr. 22350, at 8.
158. The record establishes that MDS is prepared to alert these Old Order Amish and to provide for their evacuation and emergency care in the event of an accident at TMI. Bath (Attachment 3), ff. Tr. 22350, at 8. Thus we find that special provisions have been made for the Old Order Amish who might be affected by an emergency and that the relief sought in Contention EP-17(A)(3) has been provided.

^{32/} State notification of the MDS representative was successfully tested during the June 2, 1981 exercise for TMI. Bath (Attachment 3), ff. Tr. 22350, at 8.

159. Finally with regard to the plume EPZ for TMI, Contention EP-17(A)(4) asserts that:

To the extent that the Licensee relies upon the decision of county officials in the Three Mile Island area to develop and maintain a 20-mile emergency response capability as a substitute for making a determination that the 10-mile circular EPZ is adequate, the adequacy of such a 20-mile capability must be established as a condition to the restart to TMI-1.^{33/}

We have previously noted that the NRC's emergency planning rules require the development of a plume EPZ of about 10 miles in radius. Apart from the planning necessary for the ingestion EPZ, planning beyond the area of the plume EPZ established in accordance with the NRC's regulations exceeds that called for by the regulations and is not required. Chesnut and Bath, ff. Tr. 19626, at 14. Testimony by both the Licensee and the Staff indicates that neither the State nor the Licensee relied upon 20-mile evacuation plans or upon county planning beyond the designated plume EPZ for making an informed determination of the size, shape and extent of the EPZ. Rogan et al., ff. Tr. 13756, at 111; Chesnut and Bath, ff. Tr. 19626, at 14. We have found no evidence to the contrary in either the State or the Licensee's planning. Accordingly, we find Contention EP-17(A)(4) to be without merit.

^{33/} Contrary to the premise of this contention, the plume EPZ for TMI is not a circle with a 10-mile radius. Commonwealth Ex. 28.

F. Protective Action Decisionmaking

160. In the event of a radiological emergency posing a threat to members of the public, a number of protective actions may be taken in an attempt to avoid, reduce or minimize the consequences to the public. For persons onsite at TMI, the protective actions available and provided for are sheltering, respiratory protection, thyroid blocking through the use of radioprotective drugs, partial evacuation of the site, and control of access to the site. Tr. 15152-53 (Chesnut). For persons offsite, protective actions available and provided for are sheltering, evacuation and access control in conjunction with evacuation, and thyroid blocking for emergency workers and institutionalized persons. Tr. 15153-54 (Chesnut). For members of the public, the objective of protective actions is to avoid exposing persons to doses in excess of the Protective Action Guide (PAG) values. Tr. 13827-28 (Rogan).
161. A number of contentions have been raised which relate to protective action decisionmaking and factors that bear on that decisionmaking. These contentions deal with various aspects of the general criteria used in protective action decisionmaking, with evacuation time estimates to be used for determining whether evacuation is a viable protective action, with consideration of contingencies which affect protective action decisions, and with specific ingestion PAGs. The contentions in each of these areas are addressed below.

1. General Criteria

162. Contention EP-4(H) asserts:

RG 1.101 Sec. 6.4 requires the licensee to specify "criteria for implementing protective actions . . ." The Licensee's EP fails to set forth the following mandatory items of information regarding the time required for protective action implementation:

1. Expected accident assessment time. RG 1.70, Sec. 13.3.1-2.
2. Time required to warn persons at risk. RG 1.101, Sec. 6.4.1-2(b); RG 1.71, Sec. 13.3.1-3,4.
3. Time required for a general evacuation. RG 1.70, Sec. 13.3.1-5,6; November 29, 1979 letter to "All Power Reactor Licensees" from Brian K. Grimes, Director, NRC Emergency Preparedness Task Group.
4. Time required to evacuate special facilities (e.g., hospitals). November 29, 1979 letter, supra. See NUREG-0654 JB.

As to part (1) of this contention, there are no requirements in the new emergency planning regulations and no criteria in NUREG-0654 stipulating that accident assessment time be set forth in emergency plans or emergency procedures.^{34/} The Licensee's Emergency Plan utilizes the accident classification scheme and accident assessment concept called for by NUREG-0654 and this provides for rapid accident assessment. The evidence shows that it is neither practical nor useful to predict and

^{34/} The Staff has indicated that those portions of Regulatory Guide 1.70 which are referred to in Contention EP-4(H)(1) and which called for statements of accident assessment time have been superceded by the requirements of the new emergency planning rules and by the criteria of NUREG-0654. Chesnut ff. Tr. 15007, at 46.

rely upon accident assessment times. Chesnut ff. Tr. 15007, at 46-47. Accordingly, we find that absence in the Licensee's Emergency Plan of time estimates for accident classification and assessment is not a deficiency.

163. As to part (2) of Contention EP-4(H), the evidence indicates that the Licensee's Emergency Plan provisions for onshift staffing and notification assure prompt notification of offsite state and county emergency response agencies within about 15 minutes of declaration of an emergency. Chesnut, ff. Tr. 15007, at 47-48. In addition, we have previously found that with completion of the Licensee's siren alerting system, the capability will exist to alert essentially all members of the public within the plume EPZ for TMI within about 15 minutes of a decision by governmental authorities to activate the siren system. Thus, it will be theoretically possible to alert the public within about 30 minutes of the declaration of an emergency by the Licensee. However, it is obvious that the period of time from declaration of an emergency to alerting the public is dependent upon the period of time it will take for governmental authorities to reach a decision to activate the prompt alerting system. Further, it is obvious that that period of time will depend upon the severity of the accident and the circumstances of the emergency. For a very severe accident, the decision to alert the public may be made by emergency response organizations at the time they are

initially notified of the accident by the Licensee. For TMI incidents that never progress beyond the Unusual Event or Alert category, the decision may be made to not activate the prompt alerting system at all. Thus, it appears to be neither practical nor useful for the Licensee's Emergency Plan to contain an estimate of the time it will take from declaration of an emergency to alerting the public and the absence of such an estimate in the Licensee's plan would not be a deficiency.

164. As to parts (3) and (4) of Contention EP 4(H), in March 1981, the Licensee, through its consultants Parsons, Brinckerhoff, Quade and Douglas, Inc., completed an extensive and detailed evacuation time estimate study for the TMI plume EPZ (hereinafter referred to as the Licensee's evacuation time estimates or the Parsons/Brinckerhoff study). This study, which is discussed in greater detail in Section II.F.2, infra, will be utilized by the Licensee as a basis for making protective action recommendations to the State. Tr. 22920 (Chesnut). It will also be utilized by the State in making protective action decisions. Tr. 22361-63 (Bath). This study provides evacuation time estimates, by evacuation sectors for each of three different scenarios, for a general evacuation and for the evacuation of special facilities. Licensee Ex. 52, Tables 24A, 24B, 24C. Consequently, the assertions in Contention EP-4(H)(3) and (4) that Licensee has failed to provide time estimates for a general evacuation and for the evacuation of special facilities are erroneous.

165. In sum, we find Contention EP-4(H) to be without merit and we reject it.

166. Contention EP-5(E) asserts that:

There is no reasonable assurance that appropriate protective measures will be taken in the event of a nuclear accident with offsite radiological consequences for the following reasons:

1. The Commonwealth's criteria for appropriate protective action choice, as set forth in Sec. VIII of its BORP plan, are inconsistent with those of the Licensee (EP, p. 6-13). According to the Licensee evacuation is the appropriate protective action if dose projections approach the lower limits of EPA PAGs. According to BORP this would not be the case unless the upper limits of the PAGs were approached. Although the Licensee indicates that sheltering is the appropriate choice for atmospheric releases of short duration, the BORP plan proposes evacuation for "sudden severe accidents." The Licensee would not recommend evacuation in the event of a continuous release if "evacuation cannot be well underway prior to plume arrival," while BORP would order an evacuation in such a case regardless of wind speed and warning time.
2. The BORP plan fails to quantify protective action selection criteria such as "time to onset of release . . . time required to effect relocation," and the definition of "puff release." Such quantification of criteria is a necessary ingredient in effective planning and is required by N. 0654 Sec. J10 (m).
3. The Commonwealth does not comprehend the distinction between "core-melt" and "melt-through" accidents as these terms are employed in NUREG CR-1131.
4. The Commonwealth declines to employ "state-of-the-art" calculational methodology, as set forth in EPA 520/1-78-001B, in turn referenced in N. 0654 at p. 55, n.1(3), in conjunction with hypothetical accident release characteristics to assist it in making appropriate protective action selection.

5. The Commonwealth's discussion of the sheltering option is inadequate in that it fails to emphasize the importance of the use of building basements (see NUREG CR-1131) or of ventilating the shelter at the appropriate time (see WASH 1400, App. VI, Sec. 11.1.2) as means to maximize the effectiveness of this measure. This inadequacy is carried through to instructions to be provided the public as set forth in county plans.

As to part (1) of this contention, a review of both the Licensee's Emergency Plan and that of BRP reveals that both plans use as a criterion for evacuation projected doses approaching one Rem Whole Body or 5 Rem to the infant thyroid. Commonwealth Ex. 2A, Appendix 8, at VIII-1 and Licensee Ex. 30, at 6-14. The criteria of the Licensee and BRP are thus consistent in this regard. Reilly, ff. Tr. 18125, at 5; Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 3. Sheltering will be considered by BRP when, among other things, "the combination of warning time, plume arrival time and release time is not long enough to effect evacuation." Commonwealth Ex. 2A, Appendix 8, at VIII-2. In the Licensee's Plan, sheltering is a consideration if, "evacuation could not be well underway prior to expected plume arrival due to short warning time, high wind speeds and/or foul weather," or the "[r]elease time is expected to be short." Licensee Ex. 30, at 6-14. Although these criteria are phrased differently, they are wholly consistent. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 8-9. In short, the inconsistencies alleged in Contention EP-5(E)(1) do not exist.

167. Part (2) of Contention EP-5(E) alleges that the BRP Plan is deficient because it fails to quantify parts of protective action selection criteria such as the "time to onset of release" and the "time to effect relocation" and because it lacks a definition of "puff release." A review of the protective action selection criteria set forth in the revised BRP Plan reveals that, in fact BRP does not refer to "time to onset of release" or "puff release" in its criteria. Commonwealth Ex. 2A, Appendix 8, at VIII-1 to VIII-3. Consequently, there is nothing in BRP's criteria to quantify in this regard. Beyond this, BRP has defined its concept of "time to onset of release" and "puff release" indicating that for BRP's purposes, these terms are adequately quantified (Reilly, ff. Tr. 18125, at 6-7) and lack of further quantification in this regard should not affect BRP's protective action decisions. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 10. As to the alleged lack of quantification of "time to effect relocation," we have previously alluded to the Licensee's evacuation time study which provides evacuation time estimates for various evacuation scenarios. The Commonwealth has accepted these time estimates after considerable evaluation of them and will utilize them in its protective action decisionmaking. Tr. 22361-63 (Bath). Consequently, each of the allegations in Contention EP-5(E)(2) are without merit.

168. Intervenor's allege in Contention EP-5(E)(3) that the Commonwealth does not comprehend the distinction between the terms "core melt" and "melt through." These terms are used in evacuation criterion A.1 of the BRP Plan wherein it is stated that "This option [evacuation] will be considered when:
1. A core melt accident is underway, which involves or is expected to involve a loss of containment integrity by melt through or by direct release to the atmosphere "
- Commonwealth Ex. 2A, Appendix 8, at VIII-1. BRP has specifically defined "core melt" as an accident leading to a change of phase of core material from solid to liquid, and "melt through" as a core melt leading eventually to containment failure by penetration of the molten core through the reactor vessel and the floor of the containment. Reilly, ff. Tr. 13125, at 7. These definitions seem to be reasonable and accurate and the evidence indicates that the Commonwealth's usage of these terms in its emergency plan is proper. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 10-11. There is no reason to believe to the contrary and we find that Contention EP-5(E)(3) is frivolous.
169. Contention EP-5(E)(4) faults the Commonwealth for its failure to use EPA 520/1-78-001B, "Protective Action Evaluation Part II, Evacuation and Sheltering as Protective Actions Against Nuclear Accidents Involving Gaseous Releases," in its protective action decisionmaking. This document is referenced

in NUREG-0654 as one that "may" be used to determine the sheltering protection provided by residential units or other shelters. Staff Ex. 7, at 64. The document provides guidance but its use is not mandatory. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 11-12. The Commonwealth does not use the document directly because the techniques provided in it for determining shelter effectiveness involve a complicated process requiring the input of 13 parameters with a range of values for many of the parameters. This technique is simply not practical for use in a crisis. Reilly, ff. Tr. 18125, at 7-8. In view of this and of the fact that use of this EPA guidance document is not mandatory, this Board cannot fault the Commonwealth for eschewing the use of the EPA document. Thus, we reject Contention EP-5(E)(4).

170. Finally, in Part (5) of Contention EP-5(E), Intervenors allege inadequacies in the Commonwealth's planning with regard to sheltering due to its failure to emphasize the importance of basements or of ventilating shelters. The Commonwealth views sheltering as a useful protective action option when dose projections are in the PAG range and the radioactive release occurs so quickly and is so brief that evacuation cannot be accomplished. The State has not emphasized the use of basements for sheltering because basements are not universally available in the TMI area. Similarly, the State has not emphasized ventilation of shelters because the proper time to

ventilate depends on the availability in each shelter of some means of forced ventilation and on the proper ambient wind speed. Reilly, ff. Tr. 18125, at 3. In these circumstances, it appears to be prudent to avoid emphasis on the use of basements for sheltering and on ventilation of shelters. The fact that neither the State nor the county emergency plans emphasize the use of basement sheltering and ventilation of shelters is of no moment. If, during an emergency at TMI, sheltering is in effect as a protective action and the State determines that basement sheltering would enhance protection or that ventilation of shelters is needed, instructions on either matter may be given to the public by means of EBS announcements. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 41. Thus, we find Contention EP-5(E)(5) to be without merit.

171. In sum, for the reasons stated, we find each part of Contention EP-5(E) to be without merit and we reject this contention in its entirety.

172. In Contention EP-5(B), it is asserted that:

The Emergency Planning Review Guidelines requires state/local plans to designate "protective action guides and/or other criteria for implementing specific protective actions . . ." (Sec. IV(B)(1); emphasis added) and "information needs" for implementing such protective actions (Sec. IV(B)(2)). The BORP Plan both fails to explicitly impose upon the Licensee clear responsibility for fulfilling such information needs or, where required, to undertake to satisfy them at its own initiative.

1. Section VIII(A) of the BCRP Plan indicates "time to onset of release" as a significant factor in determining the appropriateness of recommending evacuation. However, nowhere is the Licensee given explicit responsibility for providing such information, nor does the Plan contain an analysis of how variation of this factor will affect the choice of appropriate protective action. See, e.g., NUREG 0610, p. 13, par. 4(c).
2. A second factor listed is "time required to effect relocation." NUREG 75/111, Sec. J(6) requires an adequate state plan to include development of "bases and time frames for evacuation" resulting in "estimates of the time required to carry out evacuation procedures" that reflect consideration of such factors as "impaired mobility of parts of the population" (Sec. J(7)(c)) and "potential impediments to use of egress routes, such as rush hour traffic and inclement weather" (Sec. J(7)(f)). The availability of this and other information specified by the President's Commission is an essential prerequisite to adequate emergency planning and decisionmaking whether or not in the context of an actual emergency situation. See also, H. 0654, Section j(10) (k; note requirement for specification of "contingency measures"), (l) & (m).

As to part (1) of this contention, the evidence shows that the Licensee's Emergency Plan specifically lists followup information which will be provided to BRP. In addition, a direct "radiological line" between BRP and TMI will be opened in the event of an emergency.^{35/} The detailed information on plant conditions and radioactive release characteristics to be provided by the Licensee, along with the use of the "radiological line," are adequate for providing information

^{35/} The communications links between BRP and the Licensee that are relied upon by BRP for obtaining information are currently in place and operational and are tested frequently. Tr. 13243 (Reilly).

needed by BRP. Chesnut and Bath ff. Tr. 19626, at 4-5. BRP has clearly indicated that it will ask for any information it needs (Reilly, ff. Tr. 18125, at 4) and that it has confidence that the Licensee will supply such information (Tr. 18238 (Reilly)). In the event that the Licensee is unable to provide the "time to onset of release," BRP has, in its written procedures, accident assessment methods based on WASH-1400 fault tree analysis which it will utilize to estimate "time to onset of release" for purposes of protective action decisions. Reilly, ff. Tr. 18125, at 4; Tr. 18141-43 (Reilly). Thus, BRP has the capability, independent of Licensee, to predict the time to onset of release and the release duration. Tr. 18144-45 (Reilly). Accordingly, we find the assertions of Contention EP-5(B)(1) to be without merit.

173. In part (2) of Contention EP-5(B), Intervenors again raise the matter of the need for an evacuation time estimate asserting that such estimate must reflect such factors as improved mobility of parts of the population and impediments to the use of egress routes such as inclement weather. As previously discussed, the Licensee has provided a detailed evacuation time estimate for the TMI plume EPZ that will be used by the State in its protective action decisionmaking. The Licensee's evacuation time estimate study includes time estimates for an evacuation on a typical weekday, reflecting normal traffic, and for an adverse weather (snow) condition with roads

temporarily impassible and road capacities reduced. Licensee Ex. 52, at 60. Thus, the Licensee's evacuation time estimates account for conditions in which impediments to the use of egress routes exist. Moreover, the Licensee's evacuation time estimates for each evacuation condition include estimates for the time to evacuate special facilities such as schools, colleges, long-term care facilities, hospitals and prisons, all requiring special evacuation techniques and vehicle transportation. Licensee Ex. 52, at 13, 29, Tables 24A, 24B, 24C. The time estimates also account for evacuation of persons without cars. Id., at 52. In this way, the estimates reflect consideration of impaired mobility of parts of the population. Consequently, we find that the Licensee has provided the evacuation time estimate information sought in part (2) of Contention EP-5(B) and that this portion of the contention has been satisfied.

2. Evacuation Time Estimates

174. NUREG-0654, Criterion J.10.1 provides that State and local emergency response organizations are to implement protective measures for the plume EPZ which include time estimates for evacuation of various sectors of the plume EPZ developed in accordance with Appendix 4 to NUREG-0654. Staff Ex. 7, at 61, 63. The primary purpose of such time estimates is to provide a basis on which to determine whether evacuation is a viable protective action option in a particular situation. Tr. 11820-21 (Rogan).

175. In response to this criterion, the Licensee developed and supplied for the Commonwealth's use a detailed evacuation time estimate for three different evacuation scenarios. Those scenarios are: a best estimate condition involving an evacuation at night when families are together at home and special facilities have reduced staff; a normal condition reflective of a typical weekday when schools are in session, businesses are in operation, tourists and business travelers are dispersed throughout the area and special facilities are operating with normal staffs; and an adverse weather condition typical of a winter morning following an average snowfall with snow emergency conditions in effect and roads rendered temporarily impassible. Licensee Ex. 52, at 60. Based on detailed studies establishing permanent resident population, transient population, special facility and school populations and vehicle estimates (Licensee Ex. 52, at 4-44) and on evacuation route capacity determinations established from a physical inventory of evacuation routes and standard road capacity calculations (Licensee Ex. 52, at 55), lower and upper bound evacuation time estimates by sector for each of the three scenarios were produced. (Licensee Ex. 52, Tables 24A, 24B, 24C). For each scenario, the lower bound estimates represent a situation in which there is a high level of mobilization of emergency forces prior to evacuation such as might be the case for a slowly developing accident which

provides a long lead time for prior mobilization. The upper bound estimates represent a situation in which there is a poor state of readiness of emergency forces and resources due a sudden accident at TMI leading to a spontaneous order for evacuation. Licensee Ex. 52, at 55.

176. The Licensee's evacuation time estimate study was reviewed for the Staff by Staff consultant Thomas Urbanik who was one of the principal authors of NUREG-0654, Appendix 4 which sets forth the criteria for evacuation time estimates. Based on that review, Mr. Urbanik determined that the calculational method used was consistent with NUREG-0654, Appendix 4 criteria and that detailed population estimates for permanent residents, transients and special facilities were produced in accordance with NUREG-0654 guidance. Urbanik, ff. Tr. 19137, at 4. Mr. Urbanik expressed his view that the range of scenarios evaluated were generally reflective of conditions that could exist in an actual evacuation,^{36/} that the upper bound estimates provide reasonable estimates of increased

^{36/} Mr. Urbanik identified a single concern with regard to the Licensee's study, that being that there was no indication that an adverse weather condition involving rain during normal daytime conditions was considered. Urbanik, ff. Tr. 19137, at 6. The evidence indicates, however, that the condition of rain with a normal daytime population would not produce longer evacuation times than the snow scenario chosen as the adverse weather condition because rain, while it may reduce vehicle speeds slightly, does not reduce road capacity as is the case with snow. Tr. 17934 (Schaufler). The Commonwealth concurs in the choice of the snow condition as the proper adverse weather condition to use. Tr. 18022-23 (Lothrop).

evacuation times due to a poor state of readiness and will provide a usable mechanism for accounting for conditions existing at the time of evacuation, and that the Licensee's estimates are in compliance with NUREG-0654 criteria and provide reasonable estimates of the range of times required to evacuate the plume EPZ for TMI. Urbanik ff. Tr. 19137, at 5-6. We concur in Mr. Urbanik's conclusions in this regard.

177. The Commonwealth has evaluated Licensee's evacuation time estimate study and has determined that it contains basically all of the assumptions that were present in PEMA's initial evacuation planning. Tr. 17999-18000 (Lothrop). While the Commonwealth had identified limited conflicts between the evacuation time estimate study and actual planning (Tr. 18020 (Lothrop, Straube)), PEMA is working with the counties on county plan development and in so doing will establish the county capability to conform to the Licensee's study. Tr. 18023 (Lothrop). The Commonwealth has, in fact, now accepted the Licensee's evacuation time estimates and will use them in its protective action decisionmaking. Tr. 22361-63 (Bath).^{37/}

^{37/} In the event of an emergency at TMI, the Commonwealth will have available to it in the State EOC National Weather Service reports, response teams from the Pennsylvania Department of Transportation and the Pennsylvania State Police and contacts with the counties. All of this will allow the State to quickly gather information on road conditions, road construction, weather conditions and the state of mobilization. Tr. 18025 (Lamison); Chesnut and Bath, ff. Tr. 19626, at 6. Thus, the Commonwealth will have the information that will be necessary to fully utilize the evacuation time estimates and select the estimate most appropriate for the conditions in existence at the time of an emergency. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 13-14.

178. From the record made, we find that there are, for the TMI plume EPZ, evacuation time estimates prepared in conformance with NUREG-0654 criteria and that those time estimates can and will be used by the Commonwealth in determining whether evacuation is a viable protective action option in an emergency at TMI.
179. A number of contentions admitted in the proceeding fault the York and Dauphin County Emergency Plans for alleged specific failings with regard to evacuation time estimates. At the outset, we must note that we do not deem the lack of evacuation time estimates in individual county emergency plans to be of any significance. Under Pennsylvania's emergency planning, protective action decisionmaking is a function of the State. Tr. 22364 (Bath). The county emergency plans clearly indicate that the counties will rely on the State for protective action decisions and there is, therefore, no need to look to the counties on how they are providing for that function. Tr. 22365 (Bath). Thus, although NUREG-0654 indicates that counties ought to consider evacuation time estimates, that is not necessary in this instance since the counties explicitly rely on the Commonwealth for protective action recommendations. Tr. 22369-70 (Bath); Adler and Bath (2/23 Testimony), ff. Tr. 18075, at 12. In addressing each of the contentions directed to evacuation time estimates for York and Dauphin Counties, we will look to the Licensee's evacuation

time estimate study as appropriate. Since those evacuation time estimates will be used by the State, which is the primary protective action decisionmaker relied upon by the counties, we reject at the outset assertions in the following contentions that county plans are inadequate because of a total absence of evacuation time estimates.

180. Contention EP-14(KK) asserts that:

The York County Plan contains no time sequence for the removal of the exposed at-risk population. There is only assumption that there would be adequate time in which to remove all individuals; however, there is no estimate as to the number of hours that would be required to effect a selective evacuation or a general evacuation. Moreover, there is attached to the York County Plan an estimate of the number of vehicles per hour that could be handled by various major arteries and access roads; however, there appears to be a conflict in the estimates in that urban roads with parking are estimated to handle at least 1,700 cars per hour whereas major arteries could only handle 1,300 per hour and it is submitted that such a gross distortion renders the Plan deficient. Furthermore, there is absolutely no hard-core statistical data to back up the calculations relied upon in the York County Plan.

First, we note that, in fact, the Licensee's evacuation time estimates contain estimates of the time required to evacuate by sector as well as for a general radial evacuation. Licensee Ex. 52, Tables 24A, 24B, and 24C. This is in accordance with Section IV of Appendix E to 10 CFR Part 50 which requires an analysis of the time it will take to evacuate various sectors and distances within the plume EPZ. Estimates of the time required to effect a selective evacuation (defined in the York County Plan as an evacuation involving only a select category of persons such as

pregnant women and pre-school children. Board Ex. 5, at H-1) are not provided. However, we have been unable to identify any requirement in the emergency planning regulations or any criteria in NUREG-0654 calling for time estimates for selective evacuation as that term is defined in the York County Plan. In addition, there is no evidence indicating that time estimates for a "selective evacuation" are needed. Consequently, we find no planning deficiency from the lack of an evacuation time estimate for a selective evacuation as that term is used in the York County Plan.

181. As to the allegation that the York County Plan contained a reference to urban roads with parking having a capacity of 1,700 cars per hour but major arteries having a capacity of only 1,000 cars per hour, the alleged discrepancy is explainable by the fact that the "major arteries were listed under rural roads with a 12 foot wide lane while the "Urban Roads" list a 30 foot wide, one way thoroughfare. It is logical that the wider, one way road would carry more cars. Lothrop, ff. Tr. 17996, at 5; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 7. Beyond this, capacities for evacuation routes used in the Licensee's evacuation time estimates were based, not on mere assumptions, but on actual physical inventories of the evacuation route network and on standard highway capacity calculations. Licensee Ex. 52, at 55. Consequently, we find Contention EP-14(KK) to be without merit and we reject it.

182. Contention EP-14(HH) asserts:

The York County Plan has no provision in its population calculations for periods of time during the day when most people are working and outside of the area, during the day when there may be an increase in population because of industries located within the areas, or during summer periods when many individuals may be on vacation or there would be an influx of individuals coming into the area to vacation. Without that type of population differential tables, it is Intervenor's contention that the Plan is deficient.

In the same vein, Contention EP-14(MM) states:

The York County Plan does not state how many businesses are located in risk areas and what the population of those businesses are during working hours. Without this information, it would be impossible to determine the number of hours that would be required to effect a general evacuation in the event one was ordered. Therefore, it is Intervenor's position that the Plan remains defective.

Contrary to the assertions in these contentions, Licensee's evacuation time estimate study contains specific and detailed calculations, by County and municipality, of permanent resident population (Licensee Ex. 52, at 4 and Table 3), day and night resident and non-resident employment population by Counties and by "Emergency Response Planning Areas" (Licensee Ex. 52, at 11 and Table 6), and recreation/vacation/tourist and business traveler populations with seasonal variations by Emergency Response Planning Areas (Licensee Ex. 52, at 4, 9, 11 and Table 5).^{38/} The evacuation time estimates are based

^{38/} The recreation/vacation/tourist and business traveler element of the population is the only one over which there is any uncertainty. However, this component accounts for only a small part of the total population of the TMI plume EPZ and, if the estimate for this segment of the population were low by a factor of two, it would have no significant effect on the evacuation time estimates. Tr. 17909 (Schaufler).

upon these calculated populations. Consequently, we find the assertions of Contentions EP-14(HH) and EP-14(MM) to be erroneous and these contentions to be without merit.

183. Contention EP-14(DD) asserts:

The Evacuation Plan contained in the York County Plan does not contain any sensitivity analysis or differentiation between the time of day, the seasons of the year or weather conditions at the time of the evacuation. In light of these deficiencies, it is Intervenor's contention that the Plan is deficient.

Similar assertions are made in Contention EP-16(P) which states:

The Dauphin County Plan as set forth does not provide for differentiation of time of day or seasons or weather conditions at the time of the evacuation. There is no sensitivity analysis as to these factors, and the Plan is based upon an assumption of best-case analysis. Therefore, it is Intervenor's position that without taking these factors into consideration, the Plan remains deficient as concerns the time needed to effect an evacuation.

As previously indicated, the Licensee's evacuation time estimate study contains separate evacuation time estimates accounting for a range of conditions. These are: a best estimate with a night time population and population distribution in the plume EPZ; a normal condition with a typical weekday population and population distribution; and an adverse weather condition assuming an average snowfall, snow emergency conditions and temporarily impassible roads and reduced capacity evacuation routes. Licensee Ex. 52, at 60. This range of conditions is representative of conditions that may be encountered in an actual evacuation (Urbanik, ff. Tr. 19137, at 5) and provides the type of sensitivity analysis, accounting for time of day, seasons of the year and weather conditions, which is claimed in Contentions EP-14(DD) and EP-16(P) to be missing. Consequently, we find these contentions to be without merit and we reject them.

3. Consideration of Contingencies

184. Contention EP-14(N4) states:

As a general overall comment, evacuation routes as set forth are not wind-dependent, and therefore, in the event of an evacuation, wind direction is a factor that

would be required to be taken into consideration in order to formulate an effective evacuation plan. The Plan as set forth does not provide for this factor and, as such, persons evacuating the evacuation areas may be directed into a potentially more hazardous situation in the manner in which they are routed.

NUREG-0654 does not stipulate that wind direction be considered in determining evacuation routes, although it is to be considered (and will be considered by the State - Commonwealth Ex. 2A, Appendix 8, at VI-4, VI-5, VII-2, VIII-1) in choosing appropriate protective actions. Adler and Bath (3/16 Testimony), ff. Tr. 18875, at 8. In the Commonwealth's planning, evacuation routes are not wind dependent by design. If an evacuation is chosen, the State will call for a 360^o evacuation since the TMI-2 accident showed wind shifts of 180^o in short periods of time. Lothrop, ff. Tr. 17996, at 5. With significant shifts in wind direction always a possibility during the course of any evacuation, it would appear to be very impractical and possibly imprudent to pre-select evacuation routes based on potential wind direction. The Commonwealth has indicated that it will concentrate its effort and resources during an emergency in the direction at greatest risk. Lothrop, ff. Tr. 17996, at 5. We find that this is sufficient, that a pre-selection of evacuation routes based on some sort of estimate as to the potential wind direction during an emergency is impractical, and that Contention EP-14(NN) is without merit.

185. In Contention EP-14(U) it is asserted that:

Annex H of the York County Plan provides in its general concept of operations that evacuation routings would be inherently dependent upon climatic conditions, time factors involved, etc. The Plan also provides that residents would be evacuated on major interstates and state highways. There is no mention as to the condition of the access roads to these major arteries and it is submitted that evacuation generally is dependent upon climatic conditions and the conditions of the access roads within the individual townships and local communities. Access roads within Newberry Township vary from a 20 to a 26-foot width and it is Intervenor's contention that in the event of an evacuation, traffic flow on these access roads could quickly become terminated as a result of the vehicles running out of gas or being involved in auto accidents for which there would be no way in which to remedy the situation. Moreover, in ice and snow conditions, it is submitted that these access roads which are located in generally hilly areas would be generally impassable and, therefore, there would be no access to the evacuation routes. Until and unless the evacuation plan provides for a means to assure that access roads will be passable during a general evacuation, it is submitted that the Plan is deficient.

The York County Emergency Plan does implicitly assume that access roads to major evacuation routes will be usable during an evacuation. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 55. However, the revised York County Plan also specifically provides for the coordination of State and municipal police in routing evacuees. Board Ex. 5, at H-4. Local police forces deal with traffic control and traffic flow within their jurisdictions on a daily basis (Tr. 20905 (Curry)) and should be aware of potential traffic flow problem areas where their efforts may need to be concentrated. In the same vein, municipal resources normally applied for clearing access

routes of car accidents and stalled or disabled vehicles will be applied in an evacuation with the State augmenting such resources as needed. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 61.

186. As to the impact of snow or ice conditions on the passability of access roads, we find that such conditions will be accounted for in the Commonwealth's initial determination as to whether an evacuation should be ordered. One factor in that determination will be the time required to effect evacuation if that protective action is chosen and the basis for determining evacuation times will be the Licensee's evacuation time estimate study. The evacuation times for snow conditions^{39/} in that study accounted for reduced capacity of all evacuation routes, including access roads to major evacuation routes, caused by snow.^{40/} Licensee Ex. 52, at 65 and Appendix D. Thus, if snow or ice conditions would be a significant impediment to evacuation, that fact will be accounted for in the Commonwealth's decision as to whether an evacuation should be ordered.

^{39/} For purposes of evacuation time estimates, an ice condition is similar to the snow scenario explicitly considered in the Licensee's evacuation time estimates. Tr. 17915 (Schaufier).

^{40/} Road capacities for the snow condition were reduced by 20% for a road "level of service" D based on New York Department of Transportation recommendations for a heavy snow region. Tr. 17617-18 (Podwal). This actually is a reduction in capacity for all roads of between 40 and 50% because level of service D itself represents a reduction in road capacity of between 20 and 30%. Tr. 17620 (Schaufier).

187. In sum, we find that while the usability of access roads to major evacuation routes in York County is a concern, proper provision has been made for accounting for the conditions of such access roads in determining whether to order an evacuation and for assuring that such access roads remain open and passable in the event evacuation is ordered.

Consequently, we reject Contention EP-14(U).

188. In Contention EP-16(N), it is asserted that:

The Dauphin County Plan does not specifically state how the following occurrences would be dealt with in the event of an evacuation:

1. Accidents on the highways;
2. Cars running out of gas;
3. Generally disabled vehicles, and
4. Individuals who need ambulance service for removal from accidents.

The Plan does not state whether gas stations will be mandatorily required to be open in order to meet the demands of the evacuating public.

Finally, the Plan seems to assume that the best of all atmospheric and weather conditions would exist at the time of the evacuation. What would take place in the event of a snowstorm and how would that affect the evacuation? What would be done in order to clear the roads? These are all questions that have to be considered and are necessary to be considered in a total evacuation plan and the location and placement of staging areas.

The evidence shows that the local resources normally applied for accidents on highways, disabled vehicles and persons in need of ambulance service because of accidents will be applied

in an evacuation. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 61. If available local resources for these purposes are insufficient, provision has been made for the State to augment local resources and the State will provide such augmenting resources as are needed. Id.; Tr. 18016 (Lothrop). The evidence indicates that such matters as accidents and cars running out of gas or otherwise becoming disabled have not caused particular problems in other emergencies in Pennsylvania (Tr. 18015 (Lothrop)) or elsewhere (Tr. 19159 (Urbanik)) and there is no basis in the record for finding that the situation would differ in the event of an evacuation because of an emergency at TMI.

189. We similarly find the assertion that the Dauphin County Emergency Plan is deficient because no provision has been made requiring gasoline stations to remain open in an evacuation to be without merit. The State can influence gasoline allocation through the Governor's Energy Council (Tr. 18024 (Lamison)) which will provide emergency fuel allocations to assure adequate fuel supplies to support an evacuation, as was done during the TMI-2 accident. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 61. In this manner, the Commonwealth can supply

gasoline tank trucks along evacuation routes for refueling as needed.^{41/} Tr. 18024 (Lamison).

190. Finally, we take issue with the assertion in Contention EP-16(N) that the Dauphin County Emergency Plan assumes that the "best of all atmospheric and weather conditions would exist at the time of the evacuation." No such assumption appears or is implied in the Dauphin County Plan. The Dauphin County Plan explicitly provides that the "decision to require an evacuation will be based on the circumstances surrounding the incident." Board Ex. 6, at E-2. The determination as to whether evacuation is a viable option during inclement weather will be made by PEMA based, in part, on evacuation time estimates which account for, among other things, the effects of adverse weather conditions on evacuation. Moreover, the Commonwealth's Emergency Plan specifically assigns responsibility for clearing impediments (such as snow or wrecked or stalled vehicles) to evacuation traffic flow to the Pennsylvania Department of Transportation. Commonwealth Ex. 2A,

^{41/} The actual need for provisions for refueling evacuating vehicles within the plume EPZ has not been established. It is not unreasonable to expect that gasoline stations outside the evacuated area would remain open in the event of an evacuation of the plume EPZ. It is further reasonable to expect that a significant proportion of evacuating vehicles would have sufficient fuel to allow evacuation of the plume EPZ, which is, at most, 10 to 12 miles in radius, without the need to refuel before exiting the plume EPZ. Such expectations are generally supported by FEMA's experience that cars running out of fuel have not precluded successful evacuations. Tr. 19396 (Adler).

at 25. Thus, planning provisions have been made for clearing roadways, contrary to the assertions in Contention EP 16(N). In sum, we find the assertions of planning inadequacies in Contention EP-16(N) to be without merit and we reject that contention.

4. Ingestion PAGs

191. The Commonwealth's Emergency Plan contains extensive provisions for the interdiction of the ingestion pathway to prevent the consumption of foodstuffs and water contaminated in a radiological emergency. Commonwealth Ex. 2A, Appendix 7, at 20-30. Criteria for implementing specific protective actions in this regard (Commonwealth Ex. 2A, Appendix 8, at IX-1 to IX-11) are alleged to be inadequate in Contention EP-11 which states:

The BRP plan (Appendix 8) relies on the infant thyroid dose (1.5 rem) as the dose from milk ingestion to be avoided (p. IX-4). This does not take into account the fetus, whose sensitivity may greatly exceed that of the infant. In addition, the value of 1.5 rem to the thyroid from milk ingestion does not take into account the inhalation exposure.

Although the thrust of this contention is not clear from the face of the contention, it was clarified in testimony presented by the Intervenors. In that testimony, Intervenors assert that the projected thyroid dose used by the Commonwealth to trigger protective actions may be an order of magnitude too high if the sensitivity of the fetus to Iodine-131 is considered, that the sampling media (milk) used

by the Commonwealth to project doses for protective action determinations is inadequate, and that the Commonwealth considers only the ingestion pathway and ignores the inhalation pathway in making protective action determinations. Thus, according to Intervenor, the Commonwealth's planning must be modified prior to restart in order to properly protect the public. Molholt ff. Tr. 19690, at 15-16.

192. At the outset, we find that the Intervenor's assertion that the Commonwealth does not consider or account for inhalation exposure is patently erroneous. Although the PAGs that are challenged in this contention account for only those exposures projected to result from the ingestion pathway, the Commonwealth's Emergency Plan utilizes separate and distinct PAGs for projected thyroid doses from the inhalation pathway. Reilly, ff. Tr. 18125, at 10-11; Peterson, ff. Tr. 20500, at 4; Commonwealth Ex. 2A, Appendix 8, at VIII-1, VIII-2. Thus, the inhalation pathway is accounted for and we reject Intervenor's assertions to the contrary.

193. BRP uses a protective action guide of 1.5 rem to the infant from fresh fluid milk as the criterion on which protective actions are based. Reilly, ff. Tr. 18125, at 10; Peterson ff. Tr. 20500, at 2; Commonwealth Ex. 2A, Appendix 8, at IX-4. Determinations of whether to take protective actions based on this criterion will be based, among other things, on milk sampling at local farms. Tr. 18226 (Reilly). Intervenor

assert that milk samples are not as sensitive an indicator of radioiodine in the environment as the thyroids of small mammals naturally present in the TMI area. Specifically, Intervenor's claim that field voles provide a more sensitive monitor for radioiodine and that the Commonwealth should be required to utilize field voles rather than milk sampling for this purpose. Molholt, ff. Tr. 19690, at 15; Tr. 20033 (Molholt)

194. The evidence indicates that while vole thyroids may be more sensitive than milk for detecting the presence of radioiodine in the environment, (Tr. 18193-94 (Reilly)), that sensitivity is misleading due to the small size of a vole thyroid (about 0.003 grams). Due to that small size, vole thyroids give an appearance of large sensitivity on a per gram basis whereas the sensitivity on a per sample basis is not as great. Tr. 20501-502 (Peterson). Measurements of radioiodine in milk are more reliable than measurements from the thyroids of field animals. Tr. 18191-92 (Reilly). More importantly, the evidence shows that milk sampling for radioiodine is more meaningful and more accurate for evaluating doses to man than measuring animal thyroids. Tr. 18191-92 (Reilly). In addition, the time required to extract and analyze vole thyroids limits the use of this sampling media in an emergency. Tr. 18241-42 (Reilly). In view of the fact that milk is an adequate monitor of radioiodine in the environment (Tr. 18193-94 (Reilly)), we find no basis upon which to require the use of the different sampling media advocated by Intervenor's.

195. Intervenors base their claim that the PAG for thyroid dose is too high on an assertion that the sensitivity of the fetus to Iodine-131 induced hypothyroidism is 200 times that of an adult because of the higher affinity of the fetal thyroid for iodine and the greater sensitivity of rapidly dividing fetal tissues to radiation damage. Molholt, ff. Tr. 19690, at 12. The claim of a 200-fold increase in sensitivity for the fetal thyroid has not been supported quantitatively, however.
196. The Commonwealth's use of a PAG of 1.5 Rem to the infant thyroid through the milk pathway is based on guidance set forth by the Food and Drug Administration in 43 FEDERAL REGISTER No. 242 on December 15, 1978. Commonwealth Ex. 2A, Appendix 8, at IX-4.^{42/} The critical population for thyroid dose in this regard was determined by the FDA to be the infant, rather than the fetus, based on studies indicating that the infant exhibits the highest uptake of Iodine-131 per gram of thyroid tissue. Peterson, ff. Tr. 20500, at 2-3; Reilly, ff. Tr.

^{42/} These FDA PAGs for contaminated foodstuffs do not constitute regulatory requirements. On the other hand, 10 CFR § 50.47(b)(10) requires the use of guidelines for the choice of protective actions in an emergency consistent with federal guidelines and Section 50.47(b) specifically references (at footnote 1) NUREG-0654 as setting forth criteria addressing each of the planning standards in 10 CFR § 50.47(b). NUREG-0654, Criterion J.9 indicates that State and local emergency response organizations should establish a capability for implementing protective actions based specifically upon criteria that are consistent with these FDA PAGs, among others. Staff Ex. 7, at 61, Criterion J.9. Thus, these FDA PAGs, among others, appear to have been given special significance by the Commission and we deem them to be entitled to be given special weight.

18125, at 10. Studies further indicate that the dose per unit of radioiodine uptake ranges from 2 to 20 times higher for the infant than for the fetus. Peterson, ff. Tr. 20500, at 3-4.

197. Intervenors assert that evidence of the acute sensitivity of the fetus to radioiodine is provided by alleged substantial increases in the number of cases of neonatal hypothyroidism and infant mortality downstream and downwind of TMI following the TMI-2 accident. The allegation of increased instances of neonatal hypothyroidism and infant mortality is based on a comparison of the incidence of such cases prior to and following the TMI-2 accident. Molholt, ff. Tr. 19690, at 13. We find this evidence to be unconvincing. For one thing, the alleged increased rates of neonatal hypothyroidism are not spatially distributed in a manner which would be expected if they resulted from radioiodine releases from the TMI-2 accident. There were no cases of neonatal hypothyroidism in Dauphin County in the nine months following the TMI-2 accident yet that is the county closest to TMI in the direction in which the wind prevailed for two weeks following the accident. Tr. 19875 (Molholt). Increased incidents of neonatal hypothyroidism after the accident, for the most part, occurred in areas distant from TMI (Molholt, ff. Tr. 19690, at Figure 4) yet sampling data relied upon by Intervenor indicates that Iodine-131 concentrations in the environment decreased with distance from TMI, inconsistent with the increased instances of neonatal

hypothyroidism. Tr. 20037-38 (Molholt). For the one month period following the TMI-2 accident, the wind was multidirectional, on the average, with the wind blowing in each quadrant about equally. Tr. 19929 (Molholt). This appears to be inconsistent with the clustering of cases of neonatal hypothyroidism in specific areas following the TMI-2 accident.

198. The alleged increases in neonatal hypothyroidism and infant mortality following the TMI-2 accident are not consistent with the levels of radioiodine found in the environment after the accident. Despite substantial monitoring and milk and water sampling using sensitive equipment, only low levels of radioiodine were found. Tr. 18154, 18189-90, 18194-95 (Reilly). While Intervenor's witness asserted that as much as 5100 to 64000 curies of Iodine-131 were released in the TMI-2 accident (Molholt, ff. Tr. 19690, at 13), he admitted that part of the data on which that estimate is based was high by a factor of 1000 in radioiodine release. Tr. 19926 (Molholt). That estimate was based on an extrapolation from the ratio of noble gas to iodine released on April 20, 1979 (Molholt, ff. Tr. 19690, at Table 5), using the assumption that the ratio, adjusted for half-life differences, remained constant with time. Intervenor's witness admitted that that was not a reasonable assumption. Tr. 19843-49 (Molholt). In actuality, the ratio of noble gas to iodine approaches one as the mix gets

older with more noble gas present in the mix early in time. Tr. 18283 (Reilly). The erroneous assumption of a constant noble gas to radioiodine ratio with time would thus result in an overprediction of the radioiodine released. The Ad Hoc Interagency Dose Assessment Group, the Kemeny Commission, and a study performed for the Licensee all indicated low levels of Iodine-131 releases, ranging from 14 to 26 Curies, from the TMI-2 accident. Tr. 19926 (Molholt). Intervenors have presented no evidence that would bring those estimates into doubt.

199. Finally, the Commonwealth has presented evidence establishing that the increased incidents of neonatal hypothyroidism cannot be directly linked to the TMI-2 accident. The major portion of the period prior to the accident used by the Intervenors to establish a baseline for allegedly normal hypothyroid cases in Pennsylvania exhibited an abnormally low number of incidents of hypothyroidism (Tr. 20017 (Molholt)), and the data for that period cannot and should not be used for comparison purposes because the Commonwealth's screening program for thyroid abnormalities had just started and screening procedures were not yet fully developed. Tokuhata, ff. Tr. 20097, at 2. Apart from this, a Hypothyroidism Epidemiological Investigative Committee, formed by the Commonwealth to investigate alleged increases in hypothyroidism following the TMI-2 accident, concluded that there was no relationship between reported cases

of hypothyroidism and the TMI-2 accident. Part of that Committee's work demonstrated, for example, that all but two cases of hypothyroidism in Lancaster County, the area with the greatest increases in hypothyroidism following the TMI-2 accident, were caused by factors unrelated to the accident (Tokuhata, ff. Tr. 20097, at 2-3) and that the remaining two cases in Lancaster County were well within the range of incidents of hypothyroidism that would normally be expected (Tr. 20113-19 (Tokuhata)).^{43/} Similarly, a Pennsylvania Department of Health study of infant mortality concluded that there was no relationship between the TMI-2 accident and changes in infant mortality in the TMI area. Tokuhata, ff. Tr. 20097, at 6-7.

200. Based on the record made in this proceeding, we find no cause to conclude that alleged increases in neonatal hypothyroidism and infant mortality following the TMI-2 accident were caused by that accident, show that the existing protective actions are insufficient to protect the fetus or require the use of different

^{43/} The rate of neonatal hypothyroidism in Lancaster County remained high in the first 9 months of 1980, long after radioiodine releases from the TMI-2 accident should have ceased, further suggesting that the increased rates in Lancaster County after the TMI-2 accident were not a result of that accident. Tr. 20018-19 (Molholt).

and lower protective action criteria by the Commonwealth.^{44/}
Consequently, we find Contention EP-11 to be without merit.

G. Implementation of Protective Actions

201. A large number of contentions directed to specific details on implementation of protective actions were raised and admitted as issues in the proceeding. These contentions cover the areas of: unmet needs of local emergency response organizations and letters of agreement for emergency response support; communications; the chain of command for police and military forces supporting protective action implementation; police, fire personnel and National Guard support; wrecking and fuel service support; transportation, in general and for school children, for individuals without private transportation, and for invalids and persons who are homebound; post-evacuation support; medical facilities and decontamination; use of potassium

^{44/} While the sensitivity of the fetal thyroid to radiation has not been clearly established, the evidence indicates that, based on the Marshalllese experience with accidental doses to children, a dose of 1000 to 1500 Rem to the thyroid will induce hypothyroidism. Tr. 20511, 20503 (Peterson). Assuming, arguendo, that that is a hypothyroid inducing dose range for an adult, as argued by Intervenor (Intervenor assert that a fetus is 200 times as sensitive to thyroid doses as an adult) the hypothyroid inducing dose for the fetus would be in the range of 5 to 7.5 Rem to the thyroid. This is somewhat greater than the 1.5 Rem to the infant thyroid which would trigger protective action under the Commonwealth's Emergency Plan. Since the dose per unit of radioiodine uptake is substantially greater for the infant than for the fetus (Peterson ff. Tr. 20500, pp. 3-4), protective actions, such as the embargo of milk and foodstuffs, taken upon reaching a PAG of 1.5 rem to the infant thyroid, should provide adequate protection for the fetus.

iodide as a protective action; protection for farmers and livestock;* and coordination of protective actions. The contentions in each of these areas are addressed infra. First, however, it is necessary to address the matter of the impacts of psychological stress which may exist in the TMI area on the implementation of protective actions.

202. There are no specific contentions relating directly to the impacts of psychological stress (which may exist in the TMI area because of the TMI-2 accident or which may be brought into existence by another accident at TMI) on the response of the public to an emergency at TMI. Nevertheless, early on we alerted the parties to our view that, although the Commission may determine that psychological stress per se should not be considered in the restart proceeding, the psychological aspects of emergency actions and of the public's willingness to respond as requested in an emergency would be an appropriate area for inquiry. Despite the fact that no contentions on the matter were filed, questions regarding psychological stress effects on the public's response in an emergency surfaced on a recurring basis and were the subject of late-filed testimony, characterized as "rebuttal testimony" by the sponsoring Intervenors, which we admitted as a matter of discretion. The concerns raised by Intervenors basically

involve questions as to whether experiences from non-nuclear accidents or disasters are useful in predicting the reaction of the public in a radiological emergency and whether members of the public can be relied upon to follow the directions or requests of governmental authorities in an emergency, even though such governmental direction may be perceived to be contrary to the public's best interest.

203. Specifically, Dr. Kai Erikson, a sociologist testifying on behalf of the Intervenors, expressed his view that an emergency involving radiation or other contamination is potentially very different from other emergencies because radiological emergencies and other contamination events involve invisible threats as to which the public has no way of knowing how much damage is being done or when the event is over. In Dr. Erikson's opinion, this may limit the usefulness of experience from non-radiological and non-contaminating emergencies in predicting reactions in, or planning for, radiological emergencies. Erikson, ff. Tr. 21686, at 2-3. On the other hand, Dr. Erikson tacitly acknowledges in his written testimony that certain non-radiological emergencies such as toxic chemical spills and other contaminating events^{45/} may provide information which is valuable in

^{45/} Radiological emergencies can be classed, for example, in the same category as epidemics from the standpoint of a hazard that individuals cannot perceive with their senses. Tr. 17130 (Dynes).

attempting to ascertain the manner in which persons may react in a radiological emergency. Erikson, ff. Tr. 21686, at 3. Thus, radiological emergencies are not unique in this regard and, even under Dr. Erikson's categorization, there are non-radiological emergencies which can provide information which is useful in predicting reactions in a radiological emergency.^{46/}

204. Dr. Erikson also testified as to his view that the public in the TMI area will react differently in a radiological emergency than other populations because of sensitivities in the population existing from the TMI accident. According to Dr. Erikson, these residual sensitivities will result in two disparate reactions in substantial, although undefined, proportions of the population. One segment of the population will, it is claimed, be immobilized or "numbed" in a radiological emergency whereas another segment of the population will overreact or become hypervigilant. Erikson, ff. Tr. 21686, at 4-5.

^{46/} Dr. Russell Dynes, a sociologist testifying on behalf of the Licensee, expressed his view that every disaster or emergency, even those involving, for example, tornados, have, in varying degrees, the attribute that the threat cannot be clearly perceived by the public. Tr. 17131 (Dynes). In Dr. Dynes' opinion, it is not useful to designate radiological emergencies as a class apart from all other emergencies. Tr. 17128 (Dynes).

205. Dr. Erikson bases his views as to the likelihood of "psychic numbing" on the work of Dr. Robert Lifton. Erikson, ff. Tr. 21686, at 5. However, basic to the occurrence of psychic numbing, as that term is used by Lifton, is a relationship to a death experience -- that is, deaths, in substantial numbers, are an important feature of the events in which the survivors experienced psychic numbing. Tr. 21713-14, 21798-800 (Erikson). From this perspective, the Lifton work upon which Dr. Erikson bases his assertion that a large proportion of the population in the TMI area will experience psychic numbing because of residual stress from the TMI-2 accident is not applicable to the situation at hand. While common sense would indicate that certain people will become "numbed" and underreact in any serious emergency, the evidence does not establish that a "substantial proportion" of the population in the TMI area will react in this manner as claimed by Dr. Erikson. Dr. Erikson himself acknowledged that he cannot predict that psychic numbing is going to occur and does not know for a fact that it will occur in the TMI area but is only indicating his view that there is a substantial likelihood of its occurrence in any disaster. Tr. 21717-18, 21756 (Erikson). From the testimony presented, we can find no basis to conclude that a radiological emergency at TMI will result in a greater degree of "psychic numbing" in the population than any other serious emergency.

206. There appears to be some evidence to support Dr. Erikson's assertion that a substantial proportion of the population could overreact^{47/} in the event of an emergency at TMI. During the TMI-2 accident, nearly 144,000 people within 15 miles of the site evacuated when only about 2500 persons (pregnant women and pre-school age children) had been advised to evacuate. Zeigler, ff. Tr. 21818, at 7. The fact that the major part of the TMI-2 evacuation occurred on Friday night, March 30, 1979, when serious consideration by government authorities of a full evacuation became public and when the work week and school week constraints on relocating were removed (Zeigler, ff. Tr. 21818, at 12), suggests that the voluntary evacuation was, to some extent, a matter of convenience to the evacuees. Nevertheless, that voluntary or spontaneous evacuation in the absence of explicit governmental recommendations to evacuate represents the type of overreaction which Dr. Erikson believes could occur in any future TMI emergency. Several potential problems

^{47/} Overreaction is not synonymous with panic. Extensive research covering a wide variety of emergencies indicates that uncontrollable behavior or panic is a very rare phenomenon and is, in essence, negligible for most types of emergencies. Dynes, ff. Tr. 17120, at 7; Tr. 17140 (Dynes); Tr. 17638 (Podwal); Staff Ex. 18, at 1-1. The evidence indicates that panic generally occurs only under special circumstances in which individuals are faced with a highly visible and immediate threat to survival with escape routes cut off. Staff Ex. 18, at 1-1. Such circumstances should not obtain in a radiological emergency at TMI, as evidenced by the evacuation attendant to the TMI-2 accident. That evacuation was calm and orderly and did not involve hysterical flight. Zeigler, ff. Tr. 21818, at 7; Staff Ex. 18, at 1-1.

with regard to implementing protective actions in an emergency could result from such overreaction. Persons advised to temporarily shelter could, instead, attempt to evacuate thereby putting themselves at greater risk. In addition, persons outside the plume EPZ could spontaneously evacuate in large numbers, thereby complicating a previously ordered evacuation within the plume EPZ itself and affecting the time it would take to evacuate the plume EPZ in the absence of traffic control provisions beyond the EPZ. Tr. 19147-49 (Urbanik).^{48/}

207. Dr. Erikson expressed his view that the degree of overreaction by the public in a TMI emergency could be reduced and the likelihood that the public will appropriately respond could be increased by improving the credibility of government and by providing accurate information to the public. Tr. 21753, 21773-74 (Erikson). This is consistent with the views of other witnesses who have indicated that the most important elements in predicting behavior and eliciting appropriate public response in an emergency are public education and the communication of accurate information to the public. Staff Ex. 18, at 1-1. To be effective and credible in this regard,

^{48/} Voluntary evacuation by persons within the plume EPZ prior to the time that an evacuation is ordered would reduce the number of vehicles on the road during a subsequent directed evacuation and would thus reduce evacuation times. Tr. 17486-87 (Podwal).

the information and instructions given to the public must be complete and continuous (Tr. 22718 (Jaske); Tr. 19290 (Pawlowski)) and should come from a source that the public normally looks to for instructions rather than from multiple, unusual and unexpected sources not normally relied upon (Tr. 22730-31 (Jaske)).^{49/}

208. We have previously discussed, to some extent, the public education programs of the Commonwealth and the Licensee. Under the Commonwealth's Emergency Plan, the State will disseminate pre-emergency educational materials designed to provide to the public a basic understanding of the nature of radiation, of the hazards from radiation, and of measures which can provide some degree of protection from the hazards. Commonwealth Ex. 2A, at 15-1, 15-2. Materials to be disseminated will provide information on State, county and municipal planning, how the public alert/notification procedures will be implemented procedures for implementation of protective actions, including evacuation, and contacts for additional information. Id. at 15-2. The Commonwealth's emergency public information program provides for disseminating, at the time of an accident through the EBS,

^{49/} This is consistent with studies which showed that the reasons for the large scale spontaneous evacuation during the TMI-2 accident, apart from individuals' concerns for their own safety, were lack of knowledge and confusing and conflicting information from governmental sources and the Licensee. Tr. 21775-76 (Erikson); Zeigler, *fr.* Tr. 21818, at 5-6.

detailed instructions to the public in the plume EPZ on protective actions and the response of governmental agencies and the Licensee. Id. at 15-3. The Licensee's public information program entails meetings with government officials and citizens to acquaint them with the Licensee's siren alert system, general radiation education seminars, and the distribution of emergency information pamphlets. Staff Ex. 23, at II-5. By the Fall of 1981, Licensee will distribute throughout the plume EPZ the Commonwealth's emergency information pamphlet (Commonwealth Ex. 3) describing the nature and hazards of radiation, protective measures, and the manner in which the public will be informed of an emergency, along with the county emergency information pamphlets (e.g. Commonwealth Ex. 5) which provide instructions on sheltering and evacuation and specific evacuation routes and maps. Tr. 22878-79, 22917 (Chesnut). We find that these are comprehensive public education programs which, when implemented, will provide substantial information to the public on the nature of radiation and its hazards, and on protective actions and their importance. In addition, we find that provision has been made for communication to the public, through the EBS at the time of an emergency, continuous emergency information and instructions from authoritative governmental sources. These provisions for pre-emergency public education and for

emergency information and instructions will, we believe, tend to reduce the tendency for overreaction and a refusal to follow instructions during an emergency.

209. Beyond this, we have no evidence from which we could conclude that public overreaction and refusal to follow protective action instructions will occur to any substantial degree where clear instruction and directions on protective actions are provided.^{50/} PEMA's experience with emergencies in the Commonwealth is that the public displays an outward discipline in emergencies, awaiting instructions and heeding instructions when given. Tr. 17850 (Lamison). Similarly, FEMA's experience and research indicates that most evacuees will respond to instructions when the bases for those instructions have been established. Staff Ex. 1b, at 3-1; Tr. 19276,

^{50/} The point made by Dr. Erikson in his testimony was that neither he nor Dr. Dynes (the witness whose testimony Dr. Erikson was to rebut) have sufficient information on the population in the TMI area to speak confidently on how that population will react in a radiological emergency. Tr. 21808 (Erikson).

19462-63 (Pawlowski); Tr. 19277-78 (Bath); Tr. 19278, 19285-86 (Adler). We have no basis to find to the contrary for the TMI area.^{51/}

1. Unmet Needs and Letters of Agreement

210. Contention EP-14(W) states:

Annex L of the York County Plan provides for resource requirements which, it is assumed, would set forth what would be required to set the whole evacuation plan of York County into operation with regard to manpower, equipment and other resources. The Plan as of this date remains under development in this area and until and unless the Plan is completely finalized, it is Intervenor's contention that the Plan is deficient.

51/ As to the potential for the public's overreacting by spontaneously evacuating areas outside the plume EPZ, the Commonwealth is of the view that proper planning for evacuation flow has now been accomplished and that such planning will allow the spontaneous evacuation of persons outside the EPZ to be properly managed such that it will not impact evacuation of the EPZ itself. Tr. 17718-20 (D. Smith); Tr. 17853 (Lothrop). In this regard, both York and Dauphin Counties, the two counties most directly impacted by an emergency at TMI, have pre-arranged for traffic control for areas outside the EPZ. Tr. 20904 (Curry, Wertz). PEMA and the Pennsylvania State Police are in the process of upgrading the Commonwealth's traffic control plan and developing an access control plan for the plume EPZ. Bath (Attachment 3) ff Tr. 22350, at 7. With traffic control and access control at the plume EPZ periphery, spontaneous evacuation by persons beyond the plume EPZ will have little or no impact on the time it takes to evacuate the EPZ itself. Tr. 17544-46 (Podwal).

The impact of spontaneous evacuation beyond the EPZ on the need for post-evacuation support should not be significant. Research shows that spontaneous evacuees generally have planned their evacuation and have places to which they can relocate. Staff Ex. 18, at 3-1.

Annex L to the revised York County Emergency Plan does not set forth specific resource requirements for implementation of protective actions. Rather, it assigns responsibilities for identifying unmet resource needs and establishes the concept of operations through which unmet resource needs of municipalities will be fulfilled, where possible, by the county or reported to PEMA. Board Ex. 5, Annex L, §§ II, III.

211. Specific unmet resource needs for each municipality are, in fact, identified in those municipal plans which have been completed for York County. Board Ex. 13, York Haven Emergency Plan, Newberry Township Emergency Operations Plan - Appendix 9, Manchester Township Emergency Operations Plan - Appendix 9, Lewisberry Borough Emergency Operations Plan - Appendix 9, Goldsboro Borough Emergency Operations Plan - Appendix 6. The unmet needs identified in these municipal plans include items such as sets of raingear and traffic control cones as well as more significant items such as ambulances. Board Ex. 13, Manchester Township Emergency Operations Plan - Appendix 9. Such resource needs will likely change frequently as particular items are supplied by the county and as municipal equipment is retired. Detailed information on resources are not normally listed in a County Emergency Plan because of the amount of detail involved and the requirement for updating. Instead, such information is contained in the resource file in

the York County EOC. Curry et al., ff. Tr. 20787, Curry Testimony at 4. It simply does not appear to be reasonable or practical to list each unmet need existing within the county in the county emergency plan. Rather, what is important is that the county establish a mechanism for identifying unmet needs and for fulfilling such needs. That mechanism is provided in the York County Emergency Plan. Board Ex. 5, Annex L. We find no inadequacy in the fact that the York County Emergency Plan does not contain a detailed listing of all available resources for use in an emergency and, accordingly, we reject Contention EP-14(W).

212. As to letters of agreement for support services for York County, Contention EP-6D asserts:

There are numerous assignments of responsibility to persons and organizations that are not documented by written agreements demonstrating knowledge of an ability to perform assigned roles as required by N. 0654 Sec. A3. The most important of such delegations are:

1. American Red Cross (operation of relocation centers; Annex I).
2. Maryland Dept. of Health (provision of ambulances and helicopters for hospital evacuations; Annex J).
3. Amateur radio operators (communications with local governmental units and school districts; Annex D § VE).
4. "State C.D." (50-2 passenger ambulances for evacuation of nursing homes; Annex J, App. 2).
5. School Districts (transportation of school children to relocation centers and provision of facilities for such centers; Annex O).
6. York Area Transit Authority (evacuation of nursing home patients; Annex K).

7. State of Maryland (overflow mass care capacity; Annex I Sec. IVD).
8. Adams County (relocation center; Annex I).
9. York Chamber of Commerce (notification of business and industry; Sec. VIA(7)(a)).
10. York County USDA Disaster/Emergency Board (monitoring crop and animal surveillance; Annex R).

The revised York County Emergency Plan does contain letters of agreement documenting the agreement of a number of entities listed in this contention to supply support services to York County. The Maryland Department of Health and Mental Hygiene, although not referenced in the revised county plan as supplying support services, has provided a letter of agreement that is included in the revised plan. Curry et al., ff. Tr. 20787, Curry Testimony at 1; Board Ex. 5, at T-4. Two school districts with mass care responsibilities, the Spring Grove Area School District and the South Eastern School District, also provided letters of agreement that are included in the revised plan. Bath (Attachment 3), ff. Tr. 22350, at 2; Board Ex. 5, pp. T-2, T-3. A letter of agreement by the York Area Chamber of Commerce documenting that organization's agreement to assist in disseminating emergency information to York County industrial and commercial entities is included in the revised York Plan as is a statement of understanding from the York Area Transportation Authority. Board Ex. 5, at T-5, T-6.

213. Although not included in Annex T to the revised York County Emergency Plan, a Red Cross Standard Agreement has been ratified by the York Chapter of the American Red Cross and by

the York County Commissioners. Similarly, a letter of agreement has been provided by the York County agricultural agent but it is not included in the revised emergency plan. Tr. 20786-87 (Curry). While there are no letters of agreement from the "State C.D." or the York County USDA Disaster/Emergency Board, both of these entities are governmental organizations with specific emergency responsibilities assigned under the State Emergency Plan. Because of this, letters of agreement from these organizations are not necessary. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 29-30. The State of Maryland is not relied upon for emergency support in the revised York County plan and a letter of agreement from Maryland is also unnecessary. Curry et al., ff. Tr. 20787, Curry Testimony at 2.

214. Letters of agreement have been obtained from three of the four intercounty amateur radio clubs in York County. Tr. 20922-23 (Curry). However, while all letters of agreement from the amateur radio operators have not been completed, York County has on file an operational amateur radio plan signed by all four of the amateur radio clubs relied upon. Bath (Attachment 3), ff. Tr. 22350, at 2; Curry et al., ff. Tr. 20787, Curry Testimony at 1. Accordingly, additional letters of agreement are unnecessary.
215. Adams County is specifically relied upon in the revised York County Emergency Plan for mass care support. Board Ex. 5,

at I-5. Although a letter of agreement apparently does not yet exist, Adams County has informally agreed to provide a relocation center and will execute a letter of agreement in that regard. Curry et al., ff. Tr. 20787, Curry Testimony at 2. FEMA has queried Adams County and has ascertained that it is aware of its host responsibilities as specified in the York County Plan and is willing to provide the specified support. Bath (Attachment 3), ff. Tr. 22350, at 3. The lack of a letter of agreement at this time does not mean that Adams County will not respond in an emergency (Tr. 19434-35 (Adler, Bath)) and we do not view it as a deficiency in planning.

216. Although FEMA has expressed its view that letters of agreement should be provided by the Southern, Southwestern, Hanover, Red Lion and Dallastown School Districts, each of which has mass care responsibilities, FEMA has indicated that it is satisfied that each of these school districts has full knowledge of its emergency responsibilities under the York County Plan and will provide the designated support services if needed, even in the absence of letters of agreement. Bath (Attachment 3), ff. Tr. 22350, at 3. The lack of letters of agreement from these school districts does not render the York Plan inadequate. Tr. 22467 (Bath).

217. In sum, we find that the letters of agreement asserted to be necessary in Contention EP-6(D) have either been provided or will be obtained or are unnecessary and that the lack of letters of agreement from certain of the listed organizations

does not constitute an inadequacy in planning or otherwise indicate that support services relied upon will not be provided. Accordingly, we reject Contention EP6-(D).

218. As to the letters of agreement obtained by the Licensee, Contention EP-4(B) asserts:

The perfunctory form letters found in Appendix C to Licensee's EP provide no indication, let alone assurance, of the existence of "mutually acceptable criteria" for implementation of emergency measures as required by Emergency Planning Review Guideline No. One, Revision One (EPRG)IV(A)(1). Also N. 0654 A3.

Appendix C to Licensee's Emergency Plan contains a number of letters of agreement that appear to be form letters. These can be categorized into three groups: agreements with fire and rescue services; agreements with county emergency management agencies (Chesnut, ff. Tr. 15007, at 70); and agreements with local physicians. In the first category, each fire company or rescue service indicates that upon notification it will respond with emergency workers and equipment and specialized services specified in the letter of agreement. These letters of agreement, provided by organizations which respond to emergencies on a daily basis, state the nature of the services, equipment and personnel they agree to provide and the basis upon which support will be provided (i.e., "upon notification" by the Licensee). The letters clearly document the agreement of the organizations to provide identified services to the Licensee based on mutually acceptable criteria. Chesnut, ff. Tr. 15007, at 70. Thus, we find no fault with this category of "form" letters of agreement.

219. The second category of "form" letters of agreement are from the emergency management agencies for Lebanon, Dauphin, York and Lancaster Counties. Since each of these counties has developed its own emergency plan for radiological emergencies at TMI detailing the counties' responses, detailed letters of agreement are not required. In fact, the county emergency management agencies are legally recognized agencies responsible for directing and providing emergency services and letters of agreement are not even required under the NRC's emergency planning rules or NUREG-0654 guidance. Chesnut, ff. Tr. 15007, at 71. In these circumstances, we find this second category of "form" letters of agreement to be wholly adequate.
220. The third category of "form" letters contains letters of agreement from two physicians, Miles Newman and William Albright. An examination of these letters in Appendix C to the Licensee's Emergency Plan reveals that, although they are, indeed, form letters, they explicitly set forth the criteria under which the physicians' services will be provided ("in the event of an accident at Three Mile Island ... involving radiation exposure of personnel ...") and the type of services ("medical assistance") to be supplied. While they are "form" letters of agreement, we find that they appropriately document the physicians' understanding of what services they are to provide and when they will provide them and the physicians' agreement to provide such services. Thus, we find these and the other "form" letters of agreement in Licensee's Emergency Plan to be adequate and we reject Contention EP-4(B).

2. Communications

221. [redacted] of contentions have been raised regarding emergency communications capabilities. York County communications capabilities are challenged in Contention EP6-(C) which asserts that:

There is no assurance of the operability of county-local government communications links on a 24-hour basis as required by N. 0654 Sec. F1(a) and Pa. DOP Sec. IXB(1)(f).

The evidence indicates that each county EOC in the plume EPZ for TMI, including the York County EOC, has communication links which are manned 24 hours a day. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 18-19. Each municipality in York County has a fire, police or ambulance service with the capability to communicate by radio with the York County EOC. Tr. 20921-22 (Curry).^{52/} The County EOC itself has 10 dispatchers on duty at all times, 24 hours a day to handle such emergency communications within the County. Tr. 20871 (Curry). In addition, York County has an amateur radio plan and a permanently installed amateur radio capability in the York County EOC that can be used at all times. Tr. 20811 (Curry). The amateur radio plan assigns radio operators for each municipality. In the event of need during an emergency, these operators will be dispatched, along with mobile radio

^{52/} The County has four separate police radio networks, each of which has two frequencies. Tr. 20824 (Curry).

equipment, to assigned municipal EOCs, thereby providing additional capabilities for county-municipal communications. Tr. 20922 (Curry). These fire/police/amateur radio services provide additional and redundant county-municipal communications capabilities beyond those provided by existing telephone services. Curry et al., ff. Tr. 20787, Curry Testimony at 1. From the evidence presented on these county-municipal communications capabilities, we find that there is reasonable assurance of the operability of county-municipal communications links and that Contention EP6-(C) is without merit.

222. Contention EP-14(N) states

Annex B of the York County Plan indicates that the order of notification from York County is to executive group members and then to local coordinators within the risk area with priority to those nearest the facility, then to school superintendents and then to Emergency Operations Center staff. Nowhere in the Plan is it indicated how these people would be notified of the impending emergency. Intervenors again raise the issue that in the event of an incident at TMI, members of these organizations should be able to be reached without dependence upon telephone communications. Until and unless it is indicated that these individuals can be contacted without dependence upon telephone communications, the plan is deficient.

Similarly, EP 14(D) asserts:

Section VI, Subsection (d)(1) provides that, upon notification from PEMA, the County Director will assemble and consult with appropriate members of the county staff and elected officials. There does not seem to be included in the Plan any means in which to contact the local elected officials unless it is the assumption that these officials would be contacted by telephone. It is Intervenor's contention that, in the event of an emergency situation at Three Mile Island, once the public has any notice or indication that something has occurred

at TMI, that the telephone lines will become overloaded and that incoming calls to local officials will not be able to be effected. Moreover, the Plan does not indicate where local officials will assemble, how they will know where to assemble and when to assemble and thus the Plan is still deemed to be deficient.

The York County Emergency Plan identifies, and provides for notification of, all key county emergency personnel.

Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 5. The York County Commissioners, emergency staff and elected officials will be notified by phone. Because of the timing of the calls - as part of the initial notification of governmental organizations prior to notification of the public - use of phones to notify elected officials and county emergency organization staff should be adequate. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 19-20; Curry et al., ff. Tr. 20787, Curry Testimony at 3. In the event that phone lines are saturated, the county can request the emergency staff to report to the EOC by means of EBS announcements. Curry et al., ff. Tr. 20787, Curry Testimony at 3.^{53/} The revised York County Emergency Plan specifically provides that municipal emergency organizations will be notified from the County EOC

^{53/} Although it is true, as asserted in Contention EP-14(D), that the York County Emergency Plan does not specifically indicate where emergency staff and local officials are to assemble, these personnel are designated members of county and local emergency response organizations with prearranged assignments as to where to assemble in the event of an emergency. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 20. There is simply no need to designate emergency staff assembly points in the county emergency plan and failure of the plan to do so is of no moment.

using the fire encoder (Plectron) radio. Board Ex. 5, at B-4.^{54/} Thus, commercial telephone service is not relied upon for notification of municipal organizations.

223. Under NUREG-0654 guidelines, notification of key emergency response organization personnel can be by telephone and/or radio as a minimum. Adler and Bath (2/23 Testimony), ff. 18975, at 6. The provisions of the York County Plan for notification of key personnel and staff are consistent with these guidelines. We find those plan notification provisions to be adequate and, thus, we reject Contentions EP-14(N) and EP-14(D).
224. As to initial notification of Dauphin County emergency response personnel, Contention EP-16(C) states:

Appendix 3, Annex E of the Dauphin County Plan indicates that approximately 65 people will be notified in the event of an emergency. It indicates that notification of these people will be by radio whenever possible and then by telephone. Nowhere in the Plan is it indicated that the individuals listed have radios which are compatible with that of the County E.O.C. Moreover, there's no indication that the frequencies to be used for communicating with these individuals would be free of any outside disturbance. Therefore, until and unless it is indicated in the County Plan that these individuals have compatible radio equipment and that frequencies are being used that are relatively free from any other type of traffic, it is Intervenor's position that the Plan remains defective.

^{54/} As previously discussed, each municipality in York County has a fire, police or ambulance service with the capability to communicate with the County EOC by radio. Tr. 20921-22 (Curr.).

The Dauphin County Emergency Management Coordinator testified that initial notification of key county emergency response personnel will be by radio, when possible, using the radio networks listed in Annex B of the revised Dauphin County Emergency Plan. Curry et al., ff. Tr. 20787, Wertz Testimony at 1. Included in the Dauphin County radio network is a specific radio network/frequency for county emergency management communications. Board Ex. 6, at B-5. This separate administrative frequency is for the sole purpose of direction and control of county emergency management personnel with distribution of a portable radio to each of the three county commissioners; portable, mobile and remote radios to the county Civil Defense Director, Assistant Civil Defense Director, Communications Officer and Deputy County Director; portable and mobile radios to the amateur radio officer, the situation analysis officer, the medical officer and all local emergency management agency directors; a mobile radio to the transportation officer, the police representative, and the fire representative; and a portable and a remote radio to the county engineer. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 25. This radio equipment was procured by the county specifically for use with the county emergency management communications network and there is frequency compatibility for all such equipment. The county emergency management communications network uses an assigned, dedicated local

government radio frequency not available under Federal Communications Commission regulations for other use and, therefore, outside disturbance on the frequency is precluded. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 23-24.

225. It has thus been established that key emergency response officials and personnel in Dauphin County have been provided with the appropriate radio communications equipment which will allow for their notification in accordance with Dauphin County planning. Consequently, we find Contention EP-16(C) to be without merit.

226. Also with regard to Dauphin County, Contention EP-16(F) states:

Appendix 6 of Annex E of the Dauphin County Plan provides that the American Red Cross, military unit assignments, fire and ambulance units, and police units will be assigned various frequencies for radio operations and will have various radio equipment at their disposal. Nowhere in the Plan is it indicated that there is in existence presently of the equipment necessary to operate on the indicated frequencies or that if the equipment is presently available, that it is being maintained. Moreover, the Plan as written indicated that the police only have two frequencies on which to operate in the event of an emergency. Furthermore, fire, ambulance, Red Cross and military units will all share the same frequency and it is submitted that in the event of an emergency, the traffic on those frequencies will cancel effective communication among all of the groups. Therefore, until and unless it is stated that each of these units has its own frequency for operation and that there are sufficient numbers of frequencies in order to ensure effective operations, the Plan is deficient. Moreover, until and unless the Plan indicates that there is an existence of compatible equipment in order to effect this part of the Plan and that there is a responsibility for maintenance of the equipment, it is Intervenor's position that the Plan remains inadequate.

In addressing Contention EP-16(C), we have discussed Dauphin County's dedicated emergency management communications system and the radio equipment distribution for that system. The emergency management communications system is a radio network separate and apart from other emergency radio networks in the county and it provides emergency communications capability for approximately 56 emergency response personnel. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 25. In addition to the emergency management communications system, Dauphin County maintains and utilizes a police communications network with five frequencies and direct communications with all municipal police departments, a fire communications network with four frequencies and direct communications with all municipal fire departments, and an emergency medical communications network with five frequencies and direct communications with all municipal ambulance services. Board Ex. 6, at B-5; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 25. Thus, there are 15 separate frequencies available in the county for police, fire, ambulance and other emergency communications use. The radio communications equipment for each of the county communications networks is in routine use by the county emergency service organizations and is maintained as part of the regularly utilized emergency services. Assurance of the availability and operability of this equipment is provided by its routine use and by communications drills called for in the

State Emergency Plan. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 26.

227. Although the evidence indicates that additional frequencies would enhance communications capabilities for Dauphin County (and, indeed, the county is currently upgrading its existing communications system to add more frequencies (Curry et al., ff. Tr. 20787, Wertz Testimony at 1)), the evidence also indicates that multiple use of particular frequencies by different emergency response groups will not cancel the effectiveness of the existing radio communications and that additional frequencies are not required. The county dispatchers in the EOC (five of whom are on duty at all times (Tr. 20872 (Wertz)) maintain net control on all frequencies assigned in the Dauphin County Plan, thus providing for the proper use of communications frequencies. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 24-25; Tr. 19123-24 (Bath). Consequently, we find Contention EP-16(F) to be without merit and we reject it.

228. As to York County planning with regard to augmentation of communications resources, Contention EP-14 (P) states, in part, that:

Annex D, Section V, provides that the concept of operation will be effected by the regular communications staff augmented by "qualified volunteers" as required. The Plan also indicated that amateur radio will be relied upon in the event of an incident at TMI nuclear facility. There is no assurance that any amateur radio operators have agreed to participate in such an operation or that each school district has had an operator assigned to it to coordinate the utilization of school buses. Moreover, there is no definition of who is a qualified volunteer in the event that volunteers are required to be used by the communications staff.

Under the York County Emergency Plan, the Radio Amateur Civil Emergency Service (RACES) is a part of the county's 24 hour per day Public Safety Communications Network with a RACES officer appointed to support and coordinate communications operations. Board Ex. 5, at C-1. The revised York County Emergency Plan specifically provides that, during an emergency, the amateur radio network will operate from the County Communications Center and will be activated to serve as a secondary system for intercounty communications. If an evacuation is ordered, assigned amateur radio operators will establish radio communications at reception centers and mass care centers.^{55/} Board Ex. 5, at C-2.

229. To back up these emergency plan provisions, York County has an all purpose amateur radio operations plan on file (Bath (Attachment 3), ff. Tr. 22350, at 2) which is supported by the signatures of the four amateur radio clubs in York County. Records maintained by the county identify the amateur radio volunteers who will be notified and assigned communications responsibilities during an emergency. Curry et al., ff. Tr. 20787, Curry Testimony at 1. Qualified volunteer operators will provide their own communications equipment for use during an emergency. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 21. We find that the York County Plan's specific assignment of an amateur radio

^{55/} The revised York County Emergency Plan does not assign amateur radio operators to schools to coordinate the utilization of school buses.

officer as a member of the county emergency management organization and the amateur radio operations plan, signed by the York County amateur radio organizations, provide assurance that qualified volunteer amateur operators will be available to fulfill those communications functions relied upon in the revised York County Plan. Accordingly, we find that portion of Contention EP-14(P) directed to York County's reliance on amateur radio operators to be without merit.

230. A number of contentions have been raised which assert inadequacies in provisions for communications in the alternate or backup EOCs for York and Dauphin Counties. In this regard, Contention EP-14(E) states:

Annex A of the York County Plan provides that the alternate EOC site will be the new Hanover Borough Building in Hanover, Pennsylvania. Intervenors again raise the contention that there still is no indication at this time that trunk lines have been laid for the transfer of the Emergency Operations Center to the Hanover location, and as such, it renders the Plan inadequate.

Similarly, Contention EP-14(C) states, in part:

Finally, the concept of operations in this section provides that RACES would provide interim communications at the Hanover site until full communications capability could be restored. It is Intervenor's position that the Hanover site must be placed in an immediate ready condition in order to effectively serve as an alternate site for emergency operations control. It is Intervenor's position that until and unless the Hanover site is placed in a ready condition, that the Plan remains deficient.

In the same vein, Contention EP-16(D) states:

Appendix 4 of Annex E of the Dauphin County Plan provides that the alternate E.O.C. office will be located in the Millersburg Borough Building. Nowhere in the Plan is it indicated that the Millersburg Borough Building is presently in an emergency readiness condition. In short, the Plan does not indicate whether, as a matter of fact, the Millersburg Borough Building can accommodate the requirements of the E.O.C. with regard to telephone trunk lines, radio communications, and other E.O.C. requirements. Until and unless this information can be verified, it is Intervenor's position that the Plan remains deficient.

Both York and Dauphin Counties do, in fact, provide for an alternate EOC and Dauphin County provides for an alternate Communications Center. Board Ex. 5, at A-1; Board Ex. 6, at A-1, B-1. However, while NUREG-0654 stipulates that each county should establish an EOC for use in directing and controlling emergency response functions (Staff Ex. 7, at 52, Criterion H.3), under the planning guidance and criteria an alternate EOC is neither required nor necessary. In these circumstances, the fact that communications for the alternate EOC may not have been installed and that the alternate EOCs may not currently be in an "immediate" ready condition cannot be viewed as a planning deficiency. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 27-28; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 22.

231. We also note that the primary EOC for York County is in the City of York, outside the plume EPZ for TMI (Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 27) and that Dauphin County's primary EOC is more than 10 miles from the TMI site (Tr. 20946

(Wertz)). Although they have designated alternate EOCs, neither the York County Emergency Management Agency nor the Dauphin County Emergency Management Agency anticipates evacuating the primary EOC and relocating to the alternate EOC in an emergency. Board Ex. 5, at A-1, Curry et al. ff. Tr. 20787, Wertz Testimony at 1. Thus, there is no particular need to fully mobilize the alternate EOCs prior to an emergency. Curry et al., ff. Tr. 20787, Wertz Testimony at 1.

232. From the evidence of record, we find that there is neither a requirement nor a need to install communication equipment in the alternate EOCs for York and Dauphin Counties or to place those alternate EOCs in an "immediate ready condition" prior to an emergency. Consequently, we find the assertions to the contrary in Contentions EP-14(E) and EP-16(D) and in parts of Contention EP-14(C) to be without merit and we reject those contentions.

3. Chain of Command

233. Contention EP-14(H) asserts that:

Appendix 2, Section III, of the York County Plan provides that the Assistant Director of Police Operations is responsible for the overall management of law and order, traffic control and security. In the event the National Guard is ordered to assist local communities, it is questionable whether the Assistant Director of Police Operations would be in a position to direct orders to a military organization as is assumed he would be in the York County Plan. There seems to be no coordination between the National Guard chain of command and the chain of command in the operations group in Annex 2, Section III, and therefore, it is Intervenor's position that the Plan is deficient in that there is no stated area of responsibility concerning police operations, vis-a-vis the National Guard.

In a similar vein, Contention EP-14(R) states:

Annex F, Section II of the Plan is inconsistent with Appendix 2, Subsection III, Subsection A in that the Assistant Director of Police Operations is stated to be responsible for all management of law and order, traffic control and security, whereas Annex F provides that the Pennsylvania State Police are responsible for coordinating law enforcement and traffic control and the Pennsylvania National Guard is responsible for providing security for the evacuated areas. Intervenor is of the position that until and unless the order of command is sufficiently, adequately and clearly stated, there lies the possibility in the Plan for mass chaos and confusion with regard to who is responsible for police services. The Plan is deficient until it states in a succinct and clear manner who will be responsible for giving direct orders to the Pennsylvania State Police, the sheriff in local police departments, and the Pennsylvania National Guard in the event there is an incident at the Three Mile Island nuclear facility.

At the outset we note that both of these contentions are incorrect in their assertions as to the authority and responsibility of the "Assistant Director of Police Operations" under the York County Emergency Plan. In the revised York County Plan, there is no such position in the county emergency response organization. Rather, provision is made for a "Police Services Officer," a position filled by the County Sheriff, who is responsible for assisting in coordinating police services for traffic control and security in an emergency. Board Ex. 5, at 18, D-1. Neither the Police Services Officer nor another individual in the York County emergency response organization has overall command of law enforcement services in the county during an emergency. Curry et al., ff. Tr. 20787, Curry Testimony at 3; Tr. 20929-30 (Curry).

234. Both the Pennsylvania State Police and the National Guard will provide support to risk counties during an emergency.

Lamison (Command and Control), ff. Tr. 17818, at 1. Under Pennsylvania law, such support forces provided by the State remain under the operational control of the State department, agency or organization which furnishes the support force.

Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 47;

Lamison (Command and Control), ff. Tr. 17818, at 1. On the arrival of the State Police and National Guard forces, the county emergency management coordinator will inform the force commander as to what assistance is needed from the support forces and the force commander, in turn, will direct his forces to perform the assigned tasks. Tr. 17823-24, 17882 (Lamison).

Use of the support forces is at the discretion of the county emergency management coordinator, in coordination with the force commander under whose direct control the support forces remain. Lamison (Command and Control) ff. Tr. 17818 at 1. In the event of problems with the support force in the assignment or the performance of tasks, the county emergency coordinator deals first with the force commander and, if the problems persist, with PEMA. Tr. 17882 (Lamison). In past emergencies, the Commonwealth has not experienced difficulties with this chain of command (Tr. 17869 (Lamison)) and there is no evidence of conflict in the chains of command among State Police, National Guard and local police forces. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 48.

235. We find that the chain of command for emergency support forces has been clearly stated. Moreover, areas of responsibility for police operations regarding the State Police, the National Guard, and county and municipal police organizations are specifically delineated in the revised York County Plan as are provisions for coordination of police services. Board Ex. 5, at D-1 to D-3. In short, the conflicts in chain of command and lack of force coordination alleged in Contentions EP-14(H) and EP-14(R) do not exist. We, therefore, find these contentions to be without merit and we reject them.

236. Contention EP 16(I) states:

Appendix 9 of the Dauphin County Plan regarding police policy and procedures during relocation indicates that when evacuation is ordered, units will proceed to predesignated stations. The Plan does not indicate where the predesignated stations are located and how the chain of command will operate in the event of relocation of local police departments and their interaction with National Guard units arriving to provide additional manpower to local departments. Until and unless a definite chain of command is stated and the relationship between civil police departments and the National Guard regarding chain of command is documented, it is Intervenor's position that the Plan is deficient.

Contrary to the assertion in this contention, relocation points for Dauphin County police units have, in fact, been predetermined and are specifically listed in the revised Dauphin County Emergency Plan. Board Ex. 6, at J-6; Curry *et al.*, ff. Tr. 20787, Wertz Testimony at 2; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 46. The evidence shows that relocated police units

will remain under the command of the police chief or ranking officer of the respective police units. Curry et al., ff. Tr. 20787, Wertz Testimony at 2; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 46.

237. The various emergency responsibilities and functions of Dauphin County municipal police forces, the County Sheriff's Office, and augmenting State Police and National Guard forces are delineated in the revised Dauphin County Emergency Plan, (Board Ex. 6, at 6, J-1 to J-3) and the county emergency management agency staff includes a Police Services Coordinator and provides for a National Guard Liaison Officer for coordination of police and National Guard emergency services. Board Ex. 6, at 6, 12. We have previously addressed the chain of command structure for support forces, such as the State Police and the National Guard, supplied by the State to the counties. Such support forces will remain under the operational control of the organization supplying the support force with emergency duties and tasks assigned to the support force directly by the force commander at the request of the county emergency management coordinator. Again, we find that the chain of command for emergency support forces has been clearly stated, and that the conflicts in chain of command and lack of force coordination alleged in Contention EP-16(I) do not exist. Thus, we find this contention to be without merit.

4. Police, Fire and National Guard Support

238. A number of contentions have been raised with regard to specific emergency services to be provided by police and fire organizations and the National Guard in the event of an emergency at TMI. In this vein, Contention EP-14(X) states:

Annex M of the York County Plan providing for military support states that the Pennsylvania National Guard will enter into active duty upon an order of the Governor. Moreover, they will respond to any individual local political subdivision's needs upon request of the local political subdivision for aid. The Plan does not state with any specificity whether the Guardsmen will be protected by radiation-proof equipment, under whose orders and directions they will remain during their encampment in a local political subdivision, and when they will arrive in the local political subdivision after requested to do so. Until and unless these deficiencies are rectified, it is Intervenor's contention that the Emergency Plan is deficient.

Contrary to assertions in this contention, the York County Emergency Plan explicitly lists the average time after activation that will be required for National Guard personnel to arrive in local jurisdictions.^{56/} Board Ex. 5, at N-2. The revised Plan also explicitly states that operational control of the committed National Guard forces will remain in the Adjutant General or the National Guard force commander

^{56/} The York County Plan specifies six hours as the average time required for the National Guard to mobilize and deploy to the area of operations. However, PEMA estimates that it will take closer to seven to eight hours for National Guard personnel to arrive at the local jurisdictions in the TMI area because the National Guard personnel that will be called upon will not be from the immediate TMI area but will come from peripheral areas. Tr. 20828 (Belser).

designated by the Adjutant General. Id. Thus, Intervenor's assertions in these regards are erroneous.

239. The York County Plan does not specifically state that National Guard personnel deployed for support services during an emergency will be protected by "radiation-proof equipment" and, in fact, such personnel will not be provided with "radiation-proof" clothing per se. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 37. However, the evidence shows that the military clothing provided to National Guard personnel will prevent radioactive particles from contacting the skin and that such personnel will have masks for respiratory protection. The equipment designated for use by these National Guard personnel should provide a higher degree of protection than is required in the circumstances. Lamison (Command and Control), ff. Tr. 17818, at 2. We find no basis for concluding that the York County Plan is deficient in its failure to state that National Guardsman will be provided "radiation-proof equipment." For this reason, and because the other assertions in Contention EP-14(X) are erroneous, we find this contention to be without merit and we reject it.
240. With regard to York County planning, Contention EP-14(00) asserts that:

Because of the experiences of the past, even the limited evacuation of pregnant women and children under five years of age left many of the areas surrounding the Three Mile Island Nuclear Power Station deserted and open to looting without proper security. The assumption that the National Guard would, in the event of an evacuation, be called up by the Governor, is one that is a void in

the evacuation plan and the National Guard is not called up or does not respond to the Governor's request because its members are busily evacuating their own families.

FEMA has indicated that, in its experience with mass evacuations, looting in the evacuated areas has not been a problem. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 41. Looting is limited in this regard by a highly visible law enforcement presence during the evacuation and in the evacuated area. Tr. 19254 (Adler). The York County Emergency Plan makes provisions for just such a presence. Pursuant to the York County Plan, Pennsylvania State Police Troop H in York will coordinate police activities in the county and provide security for risk areas. Board Ex. 5, at D-1. The State Police will provide law enforcement along major evacuation routes and the County Sheriff's Office and municipal police departments in the plume EPZ will continue to carry out their normal law enforcement responsibilities during an emergency. Id.; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 41.

241. To insure police protection for municipalities throughout the York County plume EPZ, police departments in that area have agreed to remain in their respective municipalities as long as radiation levels permit. Board Ex. 5, at D-1. If radiation levels require police departments to move outside the plume EPZ, police protection will be provided by task forces going back into the evacuated area. Id. at D-3. Provision has been

made to augment security in the risk area, as needed and required, through call up of the National Guard. Board Ex. 5, at D-1, M-1, M-2; Commonwealth Ex. 2A, at 20. Although it is true that the National Guard may be activated for emergency support services only by order of the Governor (Board Ex. 5, at M-1, § II.A), we have been given no reason to believe that the Governor would refuse to issue such an order in the face of bona fide requests from the risk counties for National Guard support in a serious emergency. If called up, those Guard forces used would not be from the immediate TMI area but would be forces brought in from peripheral areas. Tr. 20828 (Belser). That being the case, there should not be problems with National Guardsmen having to evacuate their own families from the risk area. In short, the evidence establishes that provision has been made for sufficient law enforcement personnel, including National Guard forces, in the plume EPZ for York County to insure the maintenance of law and order in evacuated areas. Accordingly, we find Contention EP-14(00) to be without merit.

242. Also with regard to York County planning, Contention EP 14(J) states:

Appendix 2, Section III, Subsection (i) provides that it will be anticipated that the Pennsylvania State Police would be prepared to support York County disaster operations in the event of an incident at the TMI nuclear facility. Moreover, it indicates that the Pennsylvania State Police would coordinate with the Pennsylvania Department of Transportation for the placement of temporary signs in support of evacuation area security.

It is important to note that there is no formulated and stated plan for the involvement of the Pennsylvania State Police in the event of an incident at TMI. It is also anticipated in the Plan that there would be the placement of some sort of temporary signs to support the evacuation of the area; however, there is no statement that such temporary signs presently exist or that they would be existing at a time of need. It is therefore contended that the York County Plan is deficient because it does not state the exact assignment of the Pennsylvania State Police in connection with all other support groups in York County.

The Commonwealth's Emergency Plan specifically provides that the Pennsylvania State Police, in coordination with PEMA, the Department of Transportation, and the National Guard, will assist and support risk counties in traffic control in the plume EPZ. For purposes of coordination in this regard, the State Police will have a response team representative in the PEMA EOC during an emergency. Commonwealth Ex. 2A, at 23-24; Lamison (Command & Control), ff. Tr. 17818, at 1. The revised York County Emergency Plan also provides for State Police assistance in traffic control during an emergency and provides for a State Police representative on the county emergency management staff for coordination of traffic control. That Plan specifically identifies major evacuation route and access route control points in York County to be manned by Pennsylvania State Police and designates the number of State Police personnel to be provided for each control point. The State Police has confirmed that it will provide the designated number of personnel at the identified control points. Board

Ex. 5, at 14, E-1, E-2, E-3. Thus, State Police responsibilities for traffic control are well defined and we find no deficiencies in the York County Plan in this regard.

243. The revised York County Plan does not identify any requirement for the use of temporary signs in support of an evacuation. Curry et al., ff. Tr. 20787, Curry Testimony at 3. The intent in the previous versions of the Plan was for the use of normal traffic control markers (such as barriers, "one-way" markers, caution signs) and not special radiological emergency or TMI evacuation signs. Tr. 20930 (Curry); Tr. 18979-980 (Bath); Tr. 17885 (Lothrop). The Pennsylvania Department of Transportation (PENNDOT) has a supply of such signs in each county maintenance shed (Tr. 17885 (Lothrop)) and provision of such signs for York County during an emergency is now coordinated with the State and PENNDOT. Tr. 20930 (Curry); Tr. 18980 (Bath). Thus, the evidence shows that the use of special radiological emergency signs is not relied upon or required and that provision has been made for procurement and use of standard traffic control signs during an evacuation in York County. We find Contention EP-14(J) to be without merit and we reject it.

244. Contention EP-14(L), directed to York County planning, states:

Appendix 3, Annex A, providing for police operations in a selective evacuation and a general evacuation provides that the police would support and assist in notification and, on request, that police operations provide fire and police support for traffic control and

security. It is submitted that support and assist in notification and support for traffic control and security are mutually exclusive operations. It is Intervenor's contention that police in local communities cannot be asked to both support traffic control and security and, at the same time, support and assist in the notification of area residents of the impending dangers and evacuation notification in the event of an incident at TMI.

In a similar vein, Contention EP-14(S) asserts, in part, that:

Annex G of the York County Plan is deficient in that it assumes that local fire companies will have sufficient manpower to effect emergency operations procedures as outlined in the Plan. As is previously been pointed out by the Intervenor, there is usually insufficient staffing of the individual fire companies to assure that all residents in rural areas would be notified of an incident at the TMI nuclear facility because of the number of miles of road located in each township.

These contentions claim, in essence, that there will be insufficient police and fire support personnel to carry out the emergency duties assigned to police and fire support units in the York County Emergency Plan. At the outset we note that, contrary to the assertion in Contention EP 14(L), municipal police forces in the York County plume EPZ are not assigned the dual responsibility of providing both traffic control/security and assisting in notification of area residents of an emergency. Rather, the revised York County Emergency Plan imposes upon municipal police only the duties of providing local traffic control and security (law enforcement). Board Ex. 5, at D-1 to D-3. The responsibility for supplemental notification of residents has been assigned to, and accepted by, municipal fire and rescue

organizations in York County. Board Ex. 5, at G-1 to G-3. Consequently, we find the assertion in Contention EP-14(L) that local police have been assigned responsibility for mutually exclusive operations in an emergency to be erroneous.

245. The actual need for large numbers of persons, whether they be fire and rescue personnel or even police personnel, to provide supplemental alerting to residents in an emergency has not been established. We have previously found that the Licensee's siren alert system, once completed, should provide essentially full alerting coverage for all areas within the plume EPZ for TMI. That system will reduce to a minimum the need for supplemental alerting of residents by fire and rescue personnel or other persons conducting door-to-door or sound truck notification in the municipalities. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 32, 33. The fire companies within the plume EPZ have agreed to provide supplemental alerting to persons not covered by the siren warning system and each municipality has been divided into sectors for fire company alert team assignments. Board Ex. 5, at G-2. Thus, planning has been effected in this regard. We find that the asserted manpower shortfall for supplemental alerting of residents in York County is not substantiated in the record. Consequently, we find Contention EP-14(L) and that portion of Contention EP-14(S) alleging such a shortfall to be without merit.

5. Wrecking and Fuel Service Support

246. In several contentions, York County planning for providing wrecker and towing services and fuel services in support of an evacuation is alleged to be inadequate. In this regard, Contention EP-6(B) asserts that:

Although the Pa. DOP, Sec. IXB(1)(p) delegates the responsibility for arranging for emergency wrecker and fuel services to risk counties, the York County plan assigns this responsibility to the Pa. National Guard (Sec. VIA(7)(c)).

In a related vein, Contention EP-14(C), in part, asserts that:

The Plan is also defective in that it is anticipated that the Pennsylvania National Guard will provide tow trucks and gasoline along evacuation routes; however, nowhere in the Plan does it indicate that the Pennsylvania National Guard has the necessary tow trucks and fuel trucks to effect such a plan. Finally, it's noted that there is no reaction time indicated in the Plan in order to assure that such tow trucks and fuel trucks could even arrive within the evacuation area due to traffic flow on the interstates and access highways.

247. We have reviewed the pertinent emergency plans in evidence to ascertain the precise reliance on wrecker and towing services and fuel services set out in those plans. Under the revised York County Emergency Plan, the County will rely upon the Pennsylvania Department of Transportation for clearance of obstacles, such as snow and wrecked or stalled vehicles, along major evacuation routes. Board Ex. 5, at E-1. Consistent with this reliance, the Commonwealth's Emergency Plan specifically provides for clearance of such obstacles on main evacuation routes by the Department of Transportation, augmented

by the National Guard, when available. Commonwealth Ex. 2A, § VII.A.21.c at 25, §VII.A.16.h. at 20. In addition, the State Plan provides that the Department of Transportation, in coordination with the National Guard, will establish emergency fuel distribution points along major evacuation routes. Id. §VII.A.21.d at 25, §VII.A.16.h. at 20. Under revised York County planning, the National Guard is not tasked to provide tow trucks or fuel trucks along major evacuation routes. Curry et al., ff. Tr. 20787, Curry Testimony at 3. Rather, the York County Emergency Plan delegates responsibility for wrecker and fuel services to municipalities to be included in their operational plans. Curry et al., ff. Tr. 20787, Curry Testimony at 1. Certain municipalities have specifically designated wrecker services and fuel supply services for use in an emergency in the municipal emergency plans themselves. Board Ex. 13, Dover Township Emergency Operations Plan, at 5; Lewisberry Borough Emergency Operations Plan, at 5; Manchester Township Emergency Operations Plan, at 5; Newberry Township Emergency Operations Plan, at 5.

248. Thus, the evidence shows that, apart from reliance on the Department of Transportation for clearing major evacuation routes, York County relies initially and primarily on County and municipal resources for towing services and fuel services in an emergency and that provision for supply of those

services is being made. The State and the National Guard are relied upon only for augmenting fuel distribution and wrecker resources. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 28. This planning approach is consistent with accepted emergency management practice. Id. There is no requirement that such augmenting resources be listed in a county plan and the failure of the York County Plan to explicitly list the number of gasoline and tow trucks available to the National Guard is not a deficiency in the Plan. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 32-33.

249. In sum, we find that York County planning on the provisions of wrecker and fuel services in an emergency does not conflict with the planning of the Commonwealth, that provision is being made by the county for the supply of wrecker and fuel services, and that the failure of the York County Plan to list the number of tow trucks and fuel trucks available from the National Guard is not a planning deficiency. Consequently, we find the quoted portions of Contention EP-14(C) and the whole of Contention EP-6(B) to be without merit.

250. Contention EP-14(CC) states:

Nowhere in the York County Plan does there exist a catalog of the tow trucks available for use in York County. Until and unless a catalog of the tow trucks available for use is attached to the Plan, the Plan remains deficient.

We have previously alluded to the fact that State and county emergency plans cannot be expected, as a practical matter, to set out in explicit detail all of the resources available and relied upon for emergency response. Curry et al., ff. Tr. 20787, Curry Testimony at 4. We believe that a catalog or listing of all "tow trucks available for use in York County" is in the category of items that simply need not be explicitly included in an emergency plan. Local law enforcement agencies use tow truck services for accidents in their jurisdictions on a daily basis and such contact points for towing services will also be known and used in an emergency. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 38. Moreover, the County Communications Center maintains a composite listing of all wrecker/towing services available in the county. Curry et al., ff. Tr. 20787, Curry Testimony at 1. This should be sufficient for use in an emergency. Thus, we find that the York County Emergency Plan is no deficient in its failure to contain a list of tow trucks available in York County and we reject Contention EP-14(CC).

6. Transportation - General

251. Several contentions have been raised which are directed to general planning for transportation during an evacuation. Among these is Contention EP-14(V) which states:

Annex K of the York County Plan provides for the transportation of various individuals out of the evacuation area. Intervenor's contention in this area is that there is no direct stated coordination of plans between YATA, local school districts, the Baltimore Transit System, and the Pennsylvania and Maryland Railroad Company. The Plan as set forth in the concept of operation indicates that total coordination of the system will be left to the county Transportation Coordinator who will establish a system, but it doesn't identify when he will establish a system to identify priority use of transportation resources. Moreover, it states that any buses without missions would report to the Vo-Tech school located in York and be dispatched from that point. There is no provision for the refueling for any of the buses in any particular area and there is no guarantee that school buses driven by volunteer drivers would be willing to return to a risk area. Furthermore, the transportation area of the York County Plan has totally disregarded the initial five-hour plan which had been included in the initial evacuation plan. Nowhere in this Plan does it appear that transportation could be effected in any set time period and, therefore, this section again, by implication, contains the realistic admission that, regardless of whether school was in session, the evacuation plan would be inoperable and unrealistic. Until and unless the Plan shows exact designation of buses, commitment by bus companies to react within set stated times and letters of agreement between the surrounding school districts and the York County Commissioners with regard to assurances of delivery of local school buses, the Plan will remain deficient.

Under York County planning, evacuation transportation needs have been identified for three groups of persons: homebounds and invalids in private residences requiring medical-type transportation; school children when school is in session; and persons without automobiles. A Transportation Coordinator and staff have been appointed to develop a transportation plan and coordinate its implementation for transporting these three groups during an emergency. Board Ex. 5, at K-1.

252. Although the actual transportation plan for York County apparently has not yet been completed, the only transportation category not fully covered by the revised York County Emergency Plan is that involving transportation for that part of the general population without cars. Bath (Attachment 3), ff. Tr. 22350, at 4; Tr. 22429-30 (Bath). Thus, provision is made for evacuation of homebounds and invalids by ambulance services and fire companies with an explicit listing of available ambulances in the revised plan itself. Board Ex. 5, at J-1, J-2, J-6 to J-8, G-1, G-3. Similarly, provision is made for the evacuation of approximately 6500 school children from the plume EPZ (Board Ex. 5, at O-4) through school district evacuation plans which are under development. Board Ex. 5, at K-2, O-1 to O-3.^{57/}

253 As to the provision of transportation for persons without cars, the County has at its disposal the resources of the York Area Transit Authority which, during an emergency, will come under the direction and control of the York County Commissioners through the designated Emergency Staff Transportation Coordinator. Board Ex. 5, at T-6; Bath

^{57/} Although school plans are not completed, the schools have the capacity to evacuate their populations. Tr. 22430 (Bath); Tr. 20908-09 (Curry). In this regard, provisions have been made to meet any shortfalls in school buses through county resources or, if necessary, through the State Department of Education. Tr. 22430, 22431 (Bath); Tr. 20862 (Beiser). In view of the development of the school district plans, letters of agreement from the school districts are not necessary. Tr. 22430 (Bath).

(Attachment 3), ff. Tr. 22350, at 4. The County also maintains a resource manual listing many other available transportation resources for use in an emergency. Id. at 4-5; Curry et al., ff. Tr. 20787, Curry Testimony at 4; Tr. 20857 (Curry). Although FEMA has expressed its view that York County, transportation planning should be enhanced by completion of the transportation plan matching these transportation resources to needs (Tr. 22392 (Bath); Bath (Attachment 3) ff. Tr. 22350, at 5),^{58/} FEMA has also indicated that these transportation resources appear to be adequate. Tr. 22392 (Bath). Utilizing these transportation resources, supporting municipal planning, and information from the Parsons/Brinckerhoff evacuation time estimate study on the number of persons without cars, the County can effectively evacuate such persons with present state of planning. Both Attachment 3 ff. Tr. 22350, at 5.

254. From the evidence presented, we find that the state of evacuation transportation planning for York County is sufficiently developed to provide assurance that evacuation of those persons without their own means of transportation, be they invalids, school children, or persons without cars, can be effected. Accordingly, we reject Contention EP-14(V).

255. Contention EP-14(AA) asserts:

Annex O of the Emergency Plan is deficient in that the concept of operations division does not require mandatory preparation of local plans for emergency notification of bus drivers and the organization of mobilization of transportation necessary to meet the needs of evacuating their student populations.

^{58/} FEMA will continue to monitor the development of York County's transportation plan and will provide assistance where possible. Bath (Attachment 3), ff Tr. 22350, at 5.

Moreover, the Plan does not include any direction or plan to the local school superintendents as to rerouting their buses for general evacuation of local residents. For example, in an emergency, is a principal of Fishing Creek Elementary School to send a bus to the Vo-Tech School for rerouting while area residents wait for transportation? Until and unless there is some type of generalized plan for each school district as to the rerouting of school vehicles not in use for removal of school population, the Plan will remain deficient.

An examination of the revised York County Emergency Plan reveals that the Plan does, in fact, impose upon school districts the responsibility to develop protective action plans for their students, to coordinate plans with their transportation resources, and to provide bus transportation for evacuating students. Board Ex. 5, at O-1. Also included in the York County Plan are provisions to notify school district superintendents upon declaration of a Site Area Emergency or a General Emergency to have them pre-position buses for use if evacuation is ordered and provisions in a General Emergency to directly notify bus companies. Board Ex. 5, at H-3, O-2. The school districts themselves have existing procedures for busing students during winter storms and other emergencies (Tr. 20908 (Curry)) and, therefore, have existing mechanisms for notifying and mobilizing bus transportation resources. Thus, provision has been made through the revised York County Plan in conjunction with existing school district procedures to notify and mobilize school transportation resources, even in the absence of completed written school emergency plans.

256. It is true that the York County Plan does not set forth directions to school superintendents on rerouting school buses for use in evacuating those members of the general population who do not have their own means of transportation. The basic reason for this is that the responsibility for evacuating persons without transportation other than school students has not been imposed upon the school districts. (See Board Ex. 5, Annex O for responsibilities of school districts). Rather, provision of such transportation is addressed in Annex K of the revised York County Plan (Board Ex. 5, at K-1, §III) wherein the County Transportation Coordinator and his staff are to develop the necessary transportation planning. We have previously addressed the status of planning and the capabilities of existing planning in this regard in relation to Contention EP-14(V). In any event, based on the responsibilities assigned to the school districts, the lack of direction to school districts to provide for rerouting of school buses to pick up persons without transportation is not a plan deficiency. Rerouting of buses and the reallocation of transportation resources after they have performed their initial mission appears to be better left to the County Transportation Coordinator who will have a better knowledge of the overall transportation needs during the emergency.
257. For the reasons indicated, we find Contention EP-14(AA) to be without merit and we reject it.

258. As to the Dauphin County Emergency Plan, Contention EP 16(T)

states:

Moreover, the plan does not envision the method of notifying school and CAT bus drivers and assumes that all drivers will respond in an emergency situation. Moreover, it doesn't indicate anywhere that the CAT bus drivers will know what is expected of them in an emergency situation and know where they are going and how to get to the appointed emergency staging areas. This is a contingency that can be planned for in advance, should be specifically set out in a plan, and thus, the absence of such specificity in the plan renders the plan inadequate.

Contrary to the assertions in this contention, the revised Dauphin County Emergency Plan specifically provides for early notification of school and commercial bus resources. The Plan designates the County Transportation Officer as one of the key persons to be notified in the event of an emergency and provides a commercial bus company/transient authority listing of bus resources and phone numbers for notifications. Adler and Bath (3/16 testimony), ff. Tr. 18975, at 60; Board Ex. 6, Annex G. The revised Plan specifically assigns to the Transportation Officer the responsibility for notification and activation of these transportation resources. Bath (Attachment 3), ff. Tr. 22350, at 6; Tr. 22407 (Bath). It further stipulates that bus companies are to be notified when an emergency reaches the Alert classification (Board Ex. 6, at G-1) and, in addition, provides for notification of the bus companies and activation of the transportation staging areas upon declaration of either a Site Area Emergency or a General Emergency. Board Ex. 6, at G-2. The locations of the transportation staging areas for Dauphin County are set forth in the Dauphin County Plan and provision is made for directing buses to the appropriate staging area at the time that the bus companies are notified to mobilize. Board Ex. 6, at G-8. Each transportation staging area will have an Overall Coordinator, an Incoming

Resource Coordinator and an Outgoing Traffic Dispatcher (Board Ex. 6, at G-8) who should be in a position to provide appropriate instructions to bus drivers as to what is expected of them.

Although planning on the notification and availability of commercial bus drivers is continuing (Curry et al., ff. Tr. 20787, Wertz Testimony at 3), we find that ample provision has been made in the revised Dauphin County Plan for notifying commercial bus drivers and for giving them direction on their emergency functions.

259. School bus drivers will be notified through the school district superintendents. Curry et al., ff. Tr. 20787, Wertz Testimony at 3. The revised Dauphin County Plan explicitly provides for notifying school district superintendents upon declaration of an emergency in the Alert category. Board Ex. 6, at E-3, L-2. Also during an Alert, school district superintendents and individual school principals will determine the status of their transportation resources. Id. at L-2. Upon declaration of a Site Area Emergency or a General Emergency, school bus resources will be notified and mobilized. Id., at L-2, L-3. Thus, methods and provisions for anticipatory notification and mobilization of school bus drivers are in effect.^{59/} Accordingly, we find Contention EP-16(T) to be without merit.

^{59/} Notification of bus drivers in Dauphin County was adequately demonstrated in the joint exercise held on June 2, 1981. Bath (Attachment 3), ff. Tr. 22350, at 6.

7. School Children Transportation

260. Two contentions have been raised dealing with specific details of the evacuation of school children in York and Dauphin Counties. These contentions are addressed infra. First, however, we find it necessary to address the matter of testimony presented by the League of Women Voters of York County on York County school evacuation in particular and on York County and municipal planning in general.

(a). League of Women Voters Testimony

261. During the course of the proceeding, testimony was presented by a panel of witnesses from the York County League of Women voters (the League) sponsored by Intervenor ANGRY. This testimony, apparently not directed to any contention in particular, was based on, and consisted of, a report and report update prepared by the League on York County emergency planning. The report, which deals with school evacuation planning and also with municipal planning in York County, was based on a series of phone or in-person interviews, initiated formally in September 1980, with, among others, school superintendents within 20 miles of TMI and the emergency management coordinators or officials from each of the 14 municipalities within the York County plume EPZ. Ryscavage, et al., ff. Tr. 21508, at 3. The report is a compendium of statements made by these officials to the League's interviewers; as well as extensive commentary and conclusions prepared by the League on its views of the status of school and municipal planning in

York County as a result of the interviews. Because of the blatant hearsay nature of the report, the manner in which it was prepared and the nature of the interviews on which it and the conclusions in it are based, the probative value of the report or testimony is questionable and we have some difficulty in giving it weight as evidence.

262. The League witnesses indicated that the League might have a format for conducting interviews but none of the witnesses, each of whom had conducted interviews for the League's report, had any training in interviewing methods. Tr. 21517-18 (Hilliard, Ryscavage, Miller). As a consequence, some questions propounded to interviewees appear to have a built-in bias^{60/} or to be misleading so as to be misinterpreted^{61/} by the interviewee.
263. The League had no formal or set criteria on what to extract from interview notes for inclusion in the League's report. Tr. 21529-31 (Ryscavage, Hilliard). This resulted in much

^{60/} For example, interviewees were asked "what communication problem or other communication problems do you see?" Tr. 21555 (Hilliard). The question itself suggests that communication problems exist.

^{61/} For example, school district superintendents were asked whether they had the capability to shelter school children. This was interpreted by at least one superintendent as a question as to whether he could shelter students on a long term basis as might be done at mass care centers rather than a question as to whether he could provide temporary shelter as a protective action. Tr. 21572-74 (Wentzel).

potentially pertinent information garnered from interviews not being reported or in interview responses being reported in a misleading manner. Thus, although the League's report states that, according to school district superintendents, many school teachers are not aware of their responsibilities to accompany students on evacuation buses, the superintendents of the West Shore (Tr. 21544-45 (Hilliard)), Central York and Northern School Districts had told interviewers that their teachers were, indeed, aware of this responsibility (Tr. 21545-46 (Miller)) and the Northeastern School District Superintendent will inform his teachers of that responsibility (Tr. 21549 (Hilliard)). None of this was reflected in the League's report. Similarly, while the Red Lion Bus Company representative informed the League interviewer that 108 of the Company's 110 bus drivers reported for duty during the TMI-2 accident and that he was sure the drivers could be relied upon in a future emergency (Tr. 21540 (Miller)), this was not reported in the League's report or written testimony (Tr. 21540 (Miller); Tr. 21541 (Ryscavage)), which instead reports on the concerns of some municipal coordinators over the availability of buses in an emergency (Ryscavage, et al., ff. Tr. 21508, Study

Update at 7).^{62/} In addition, those League members who prepared the League's report/testimony were sometimes unsure of the meaning or interpretation of responses recorded in interview notes yet they proceeded to report those responses according to their own, possibly uninformed, interpretation. Tr. 21649-51 (Hilliard, Miller); Tr. 21575-76 (Hilliard).

264. Some of the information in the League's report is simply outdated or misleading. For example, the League's statement in its November study that some school districts were planning to relocate students to places other than those designated in the York County Emergency Plan is no longer true (Tr. 21550 (Miller)) yet this is not reflected in the League's report. The statement in the League's report to the effect that no provision is made to inform parents as to where school students have been relocated (Ryscavage et al., ff. Tr. 21508, at 13) was written without the awareness on the part of the witnesses that the revised York County Plan explicitly provides for the dissemination of such information through pre-prepared EBS

^{62/} Other examples of incomplete reporting of interviewer responses not reflected in the League's report involve resources in tow trucks and radiological monitoring equipment available to municipalities (Tr. 21563-65, 21576-77 (Ryscavage); Tr. 21566 (Hilliard)) and substantial emergency preparedness and radiological monitoring training that was provided to municipal emergency personnel (Tr. 21565-66, 21577, 21585-86 (Ryscavage); Tr. 21584-85 (Hilliard)).

announcements. Tr. 21630-33 (Miller).^{53/} The League's report indicates that there are major problems with the evacuation of private schools (Ryscavage, et al., ff. Tr. 21508, School Followup at 14), yet there is only one private school within the York County portion of the plume EP2 (Tr. 21558 (Miller); Licensee Ex. 52, Table 8, at 23) and the public school district within which that private school lies recognizes its responsibility to evacuate that private school. Tr. 21558-59 (Miller).

Confirmation that the League's report is outdated was provided by the York County Emergency Management Coordinator who testified that the report does not accurately portray the level of preparedness in the county and that the general conclusions in the summary of the report are based on earlier versions of the county plan. Tr. 20959-60 (Curry).

265. Finally, much of the League's report is based on confused and sometimes third-hand information.^{64/} From cross-examination it is clear that sometimes the witnesses had no knowledge of the basis for statements made to them in interviews yet they

^{63/} Similarly, the statement in the report to the effect that "Thyroid prophylaxis agents may not be distributed on a timely basis" (Ryscavage, et al., ff. Tr. 21508, Study Update at 12) was addressed to the distribution of potassium iodide (KI) to the general public and does not reflect the more recent planning to distribute KI to emergency workers and institutionalized persons only. Tr. 21644-45 (Ryscavage).

^{64/} For example, League witness Miller used an interviewer's comments to Miller on what a school superintendent had told the interviewer to write up interview notes which formed a part of the basis for the League's report. Tr. 21555-57 (Miller).

reported such statements in testimony as statements of fact.^{65/}

266. In sum, we find the League's testimony to be sorely lacking in probative value. Its reliability is, at best, questionable and we cannot ascribe evidentiary weight to it.

(b.) Contentions

267. Contention EP-14(B) states, in part, that

Furthermore, this section of the York County Plan anticipates parents and/or families evacuating the area will be able to pick up children at schools. This again would lead to confusion within the Plan in that if a selected evacuation was ordered and pre-school children were to be removed from the area, the Plan anticipates that action would be taken by school superintendents in the evacuation of the children from schools and that there may be interference or lack of effective execution of the Emergency Plan set forth for the school systems.

Under the revised York County Emergency Plan, no provision is made for parents to pick up school children at the schools. Rather, in the event of an evacuation, school children will be bussed, as a group, to designated host schools or relocation centers outside the plume EPZ. Board Ex. 5, at 0-2, §IV.D.3, at 0-4. Parents will be informed of the fact that school children have been evacuated to specific relocation centers and that parents are to meet their children at designated centers by means of prepared EBS announcements. Board Ex. 5,

^{65/} An example is the statement in the League's report that "Some bus drivers evacuated early during the last crisis." Ryscavage *et al.*, ff. Tr. 21508, Study Update at 16. Cross-examination revealed that this was a comment made by one school superintendent. The "comment" was not probed by the interviewer who had no concept of the basis or scope of the statement. Tr. 21647-49 (Miller).

at F-13, F-14. Consequently, the problems asserted in Contention EP-14(B) with regard to earlier school evacuation planning should not arise with the revised planning and we find this contention to be without merit.

268. In Contention EP-16(J) it is asserted that:

Appendix 12 of Annex E of the Dauphin County Plan provides that during school hours, upon receipt of a condition yellow alert, school districts shall begin returning school students to their homes. Moreover, the Plan continues, that in the event parents are not home, children shall be returned to one pickup point as listed in the Appendix. There is an exception to this rule indicated in the Plan. It is Intervenor's contention that the Plan is deficient because it first of all allows the busing of the children during a condition yellow situation. It is Intervenor's contention that a much more sensible approach to this problem would be to bus all the children to a predesignated area outside of the 20-mile EPZ and allow parents in an orderly fashion to pick their children up if a condition yellow alert does not change. There is a potential, as the Plan is now written, that in the middle of busing children home during a condition yellow situation that the situation could degrade to a condition red situation and there would be no means of notifying the bus drivers of the change in a situation and the change in the school policy plan under a condition red emergency situation. Finally, Section J of this part of the Plan indicates that evacuation plans of the various school districts will be on file with the County Emergency Preparedness Agency. It is Intervenor's contention that the plans of the school districts should mandatorily be on file and reviewed periodically by the County Emergency Preparedness Agency. Until or unless this deficiency is corrected, it is Intervenor's position that the Plan is defective.

Under the revised Dauphin County Emergency Plan, evacuation of school children will be on a group basis with students bused to specified relocation centers unless, under the circumstances, an evacuation has been ordered with time permitting the schools to be closed and students released to

parents under normal transportation procedures. Board Ex. 6, at L-3. With the revised planning, school students will not be bussed home during the early stages of an accident. Rather, students will be relocated to predesignated host areas outside the plume EPZ on routes consistent with the predesignated major evacuation routes to facilitate the pickup of students by their parents. Bath (Attachment 3), ff. Tr. 22350, p. 6; Tr. 20916-17, 20919 (Wertz). Thus, the concerns raised in the contention with regard to rerouting school evacuation buses during the course of transporting students to their homes are unfounded with the revised school evacuation planning. In fact, current planning for Dauphin County is consistent with that advocated by the Intervenor in this contention.

269. As to the assertion that school evacuation plans should be on file with the Dauphin County Emergency Management Agency, the evidence indicates that individual school plans are not required for compliance with emergency planning criteria. Tr. 22401 (Bath). The evidence further indicates that Dauphin County will, nevertheless, require that school plans be on file. Thus, what is sought by the Intervenor in Contention EP-16(J) will be provided. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 55-56.

8. Individuals Without Private Transportation

270. With regard to the Dauphin County Emergency Plan, Contention EP-16(G) states:

Appendix B, Attachment B-1, indicates that there are local pickup points for individuals who are without transportation. There is no indication within the Emergency Plan as now drafted that there will be police protection for people waiting at the pickup points in order to ensure security. Moreover, the pickup points as listed do not ensure that individuals who assemble at these points will be sheltered for their protection under some type of cover. Until or unless it is assured that there will be police protection provided and that sheltering will be provided, the Plan is deemed inadequate.

NUREG-0654, Planning Standard J, Criterion 10.G calls for provisions for evacuating persons without their own means of transportation. The criteria do not stipulate, however, that security protection be provided for such individuals.

Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 39. FEMA has testified that, in its experience with mass evacuations, security has not been a problem. Id. That experience includes toxic chemical spills requiring the evacuation of persons by buses from local pickup points. Tr. 19247-48 (Pawlowski). There is no evidentiary basis for believing that security or crowd control will be a problem at pickup points and we find no planning deficiencies in the lack of explicit provisions for security in this regard.

271. Similarly, there are no requirements or criteria calling for the provision of short-term shelter or cover for persons at pickup points, and lack of provision for such shelter is not a planning deficiency. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 39. We have been given no basis for finding to the contrary.

272. In sum, we find no planning deficiencies in the Dauphin County Plan's failure to provide police protection or short-term shelter for pickup points for persons without their own means of transportation. Accordingly, we reject Contention EP-16(G).

273. Contention EP-16(R) states that:

The Dauphin County Plan as presently written envisions mass transportation vehicles to assemble at two staging areas. Upon arriving at the staging areas, the vehicles would then be dispatched to various areas to be led by community leaders. It is submitted that such a plan without the provision of security being placed on the buses and mass transportation vehicles does not ensure that said vehicles will be able to carry out their intended functions. It is submitted that more staging areas would be required in order to effectively deal with mass transportation and until and unless those local regionalized areas are stated in an emergency plan, all plans will remain deficient.

Under the Dauphin County Emergency Plan, emergency transportation staging areas will be staffed with an overall coordinator, communications personnel, an incoming resource coordinator, an outgoing traffic dispatcher, a fuel coordinator and three traffic control assistants, giving substantial government presence at each staging area. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 59; Board Ex. 6, at G-8. In addition, security for all Dauphin County emergency operations will be provided by State police and municipal police forces coordinated by the county emergency management coordinator. Curry et al., ff. Tr. 20787, Wertz Testimony at 2. Thus, there will be a highly visible governmental and law enforcement presence at the transportation staging areas and

throughout the evacuation area, particularly along major evacuation routes. In these circumstances, we see no need for additional special security measures at staging areas or on emergency vehicles.^{66/}

274. FEMA has evaluated the need for emergency vehicle staging areas in Dauphin County. From that evaluation, it concluded that the two staging areas selected by the County should be adequate. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 59. We have been given no evidentiary basis on which to disagree with FEMA's conclusion in this regard.
275. In sum, we find no need for additional security measures for staging areas and mass transportation vehicles in Dauphin County and we find no need for the designation of additional staging areas. Consequently, we find Contention EP 16(R) to be without merit.
276. Contention EP-16(H) asserts that:

Appendix 8, Attachment 3-2 of the Dauphin County Plan provides that local municipalities shall provide one personal lead vehicle to the E.O.C. Reception Area from the Staging Area. The problem with this particular part of the Plan is that there is no designation of who will be the person to lead vehicles to the E.O.C. Reception Area. Moreover, there is a candid admission that there is the chance that municipalities will hijack vehicles intended for other communities. Until and unless there is some type of security provided for incoming and outgoing units, the Plan shall remain deficient. Moreover, there is no provision in this Plan to provide for refueling of the incoming buses and ambulances and

^{66/} FEMA has testified that it knows of no mass evacuations in which emergency vehicle security has been a serious problem. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 58-59.

until and unless there is some indication of how refueling is going to take place, there is the risk that incoming buses and ambulances would run out of fuel and be rendered useless.

As to the lack of specific designations for lead vehicle operators, the evidence shows that specific personnel may be selected to lead emergency vehicles to reception centers from among the municipal personnel available at the time of the evacuation, and that there is simply no need to predesignate such personnel in an emergency plan. The lack of such predesignation is, therefore, not a planning deficiency. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 40.

277. We have previously addressed the matter of the need for additional emergency vehicle security. The source of the "candid admission that there is some chance that municipalities will hijack vehicles" is unknown but FEMA, for its part, has indicated that the hijacking of emergency vehicles should not be a serious problem. From FEMA's experience, it is unaware of any disaster, except in wartime, in which one government hijacked the vehicles of other governments to provide for evacuation or emergency services. Adler and Bath (3/15 Testimony), ff. Tr. 18975, at 40. We can ascertain no basis for concluding that emergency vehicle hijacking would be a problem in the event of an emergency at TMI. The record does not establish a need for additional security, above and beyond that already provided, in order to prevent the hijacking of emergency vehicles.

278. Finally, as to the assertion that there is a need for an explicit indication in the Plan of how refueling for emergency vehicles will be provided, the evidence indicates that, in fact, buses and ambulances will be refueled at county pumps and private gasoline stations, supplemented by the State and National Guard resources as necessary. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 41. The lack of an explicit provision for this in the Dauphin County Plan is not a planning deficiency.^{67/} Id. We reject the assertion to the contrary in the contention.
279. On the whole, and for the reasons stated, we find Contention EP-16(H) to be without merit.

9. Transportation and Care For Invalids and Homebounds

280. With regard to York County planning, Contention EP-6(F) asserts:

The preparation of a "list of homebounds and invalids" and plan for their evacuation (Annex J) and satisfaction of unmet "resource requirements" (Annex L) should be accomplished prior to TMI-1 restart.

Similarly, Contention EP-14(I) asserts:

Appendix 2, Section III, Subsection (g) of the York County Plan indicates that the Area Agency on Aging should develop a system to identify the homebound and invalid personnel that require special transportation needs and coordinate a consolidated listing with the

^{67/} The revised Dauphin County Emergency Plan specifically assigns a fuel coordinator to each emergency vehicle staging area (Board Ex. 6, at G-8), thus providing a mechanism for coordinating the procurement and distribution of county, commercial, State and National Guard fuel resources.

transportation group. Until and unless the Area Agency on Aging is directed to effect such a system, it is Intervenor's position that the York County Plan is deficient because, without such listing, there would be no way in which local communities could be assured that all invalids and homebound persons would be removed from an evacuation area.

For York County, the responsibility to prepare and maintain lists of homebounds and invalids is placed on the municipalities (Board Ex. 5, at 8) and specifically on ambulance services and fire companies. (Board Ex. 5, at J-1).^{68/} The municipalities and fire and rescue units are to provide for the evacuation of homebounds and invalids with the county Health and Medical EOC section coordinating and providing for unmet transportation needs for this segment of the population. Board Ex. 5, at J-1, G-1.

281. Six of the 14 municipalities in the plume EPZ for York County have completed municipal emergency plans listing homebounds and invalids in their jurisdictions. Although municipal plans for the other 8 municipalities are under development and not yet completed, those municipalities are aware of their responsibilities for homebounds and invalids and are planning to discharge those responsibilities. Bath (Attachment 3) ff. Tr. 22350, at 4. Lists of homebounds and invalids are currently in existence and maintained by ambulance services and fire

^{68/} Contrary to the assertion in Contention EP-14(I), the "Area Agency on Aging" is not assigned a responsibility to develop a system to identify homebounds and invalids.

companies for all municipalities in the York County plume EPZ and could be obtained quickly by the County if the need arose. Tr. 20806, 20937 (Curry).

282. The evidence thus shows that lists of homebounds and invalids requiring special transportation are maintained in each municipality by the ambulance services and fire companies responsible for evacuating such persons, that the municipalities have planned to evacuate those persons, and that provision has been made in the York County Plan for identifying unmet transportation needs for evacuating such individuals. We thus find that the mechanisms have been established for evacuating homebounds and invalids and we reject Contentions EP-6(F) and EP-14(I).

283. As to the York County Emergency Plan, Contention 14 (C) states, in part:

The Plan in Subsection (c) also assumes that homebounds and invalids will be able to be transmitted by means of ambulance and bus and that individuals with no transportation could request the same through local fire companies for bus pickup. The capabilities to effect such a plan within Newberry Township are nonexistent. For example, Newberry Township has two ambulances that could be placed into service, assuming that a volunteer would operate the same. Local communities surrounding the Newberry Township area include Goldsboro Borough and Lewisberry Borough, each borough having an ambulance to effect evacuation of their homebounds and invalids. It is submitted that within the 34-mile square area that encompasses Newberry Township and the boroughs of Lewisberry, Goldsboro and York Haven that four (4) ambulances would not be sufficient to evacuate homebounds and invalids. Moreover, transportation through local fire companies will be impossible, as local fire chiefs have indicated that they could not guarantee that any

personnel could or would effect such an evacuation service. Finally, it is submitted that if local volunteer fire companies cannot assure manpower staffing during a general emergency situation, that they cannot be again counted upon to provide transportation to designated areas for bus pickup for those individuals who are without transportation.

The evacuation of homebounds and invalids in York County is to be accomplished, to the extent necessary, by municipal ambulance services and fire companies using available ambulances. Board Ex. 5, at J-1, J-2. The York County Plan lists ambulance resources available in the County and explicitly provides that ambulances from outside the risk area will assist in the evacuation of non-ambulatory persons within the risk areas as assigned and coordinated by the County Emergency Management Agency. Board Ex. 5, at Annex J, Appendix 2 and at J-1, § II.D.

284. In those instances in which there is a shortfall in municipal ambulance resources in the risk area, municipal emergency management coordinators will identify and report such shortfalls to the county emergency management coordinator. Board Ex. 5, at Annex L. The County Emergency Management Agency Health and Medical Officer will then coordinate the procurement of transportation to fulfill the unmet municipal transportation needs for evacuation of homebounds and invalids using available ambulances from those parts of the county outside the risk area supplemented by additional resources provided through PEMA for needs that cannot be met with county

resources. Board Ex. 5, at J-1, §§ II.A, II.F.1, at J-2, § IV. The Commonwealth itself has indicated that it can provide transportation assistance to York County for the evacuation of homebounds and invalids. Tr. 18546 (Cox). Thus, while it is possible that some municipalities in the plume EPZ for York County will have a shortage of locally available ambulances for the evacuation of homebounds and invalids, additional ambulances are available from beyond the risk area and a mechanism has been established in York County planning for the procurement and dispatch of additional ambulance resources to supplement those in risk municipalities.

285. The fire companies in the plume EPZ, assigned the responsibility for providing evacuation transportation to those persons in need of it, have agreed to remain in their respective municipalities during an evacuation. Board Ex. 5, at G-1, G-2. Although the evidence does not indicate that there is a substantial shortage in the number of municipal fire and ambulance service personnel within the York County plume EPZ for the evacuation of homebounds and invalids, the same mechanism for drawing on county resources from outside the risk area to supplement transportation resources can also be called upon to provide additional personnel resources. Board Ex. 5, at L-1, § III.

286. In short, we find that the York County Emergency Plan provides an appropriate mechanism for augmenting any municipal

transportation and personnel shortfalls for evacuating homebounds and invalids from the York County portion of the plume EPZ. Although shortfalls could exist in this regard, this mechanism provides assurance that such shortfalls can be met and that homebounds and invalids can be safely evacuated. Accordingly, we find the portion of Contention EP-14(C) alleging inadequacies in the planning for the evacuation of homebounds and invalids to be without merit.

287. Contention EP-16(0) asserts that:

The Dauphin County Plan indicates that it has a total need of approximately 600 ambulances for the evacuation of all members of the exposed populace and indicates only 45 are available. The Plan also indicates that it could obtain an additional 226 ambulances from outside the county, still leaving a shortfall of approximately 300 ambulances. There is no solution to the problem indicated in the Plan.

The alleged need for 600 ambulances for Dauphin County was for an evacuation out to a distance of 20 miles from the TMI site, not for an evacuation of the plume EPZ portion of Dauphin County. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 42. The evidence shows that under the revised planning for the evacuation of the plume EPZ portion of Dauphin County, only 98 ambulances are needed and 48 ambulances are currently available. Planning is currently underway and provision is being made to bring in ambulances from support counties which can supply as many as 225 additional ambulances on request, although a formal commitment to supply that number of ambulances has not yet been obtained. Curry et al., ff. Tr.20787,

Wertz Testimony at 3; Tr. 20950-51 (Wertz). We find that the ambulance shortfall for Dauphin County is not 300 ambulances, as asserted in the contention, but only on the order of about 50 ambulances and that the ongoing planning for procuring supplemental resources for this limited shortfall should assure that the required resources will be available if needed.^{69/} Accordingly, we reject Contention EP-16(0).

288. As to the availability of facilities for relocating long-term medical care patients in Dauphin County, Contention EP-16(K) asserts that:

Appendix 13 of Annex E of the Dauphin County Plan indicates that there are approximately 4,000 long-term patients that would require relocation in the event of a general evacuation. The Appendix also includes a listing of hospitals that would be amenable to accepting long-term patients in the event of an emergency. While the Plan indicates the total number of beds available at hospitals, there is no statement as to the number of beds which would be available on an average at any set time. Until and unless the Plan indicates the number of possible available beds that could be afforded to Dauphin County in the event of an emergency, it is submitted that the Plan is deficient.

Although it is true that the revised Dauphin County Emergency Plan does not provide an estimate of the average number of hospital beds available at any time at each relocation hospital, we do not find this to be a planning deficiency.

^{69/} FEMA has indicated that in the event that adequate numbers of ambulances cannot be procured in a timely manner, shortfalls can be accommodated by the conversion of standard vehicles to make-shift ambulances sufficient for the evacuation of severely incapacitated individuals. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 42.

289. The Dauphin County Emergency Plan lists all hospitals and long-term care facilities within the Dauphin County portion of the plume EPZ and their distances from TMI. Board Ex. 6, at Appendices 1, 6. The Plan also provides standby and alert actions for these facilities and for the designated relocation facilities. At the time of an emergency, the Dauphin County Medical Officer, in the EOC, will obtain an up-to-date census by patient group at each facility so as to match evacuating patients to the available resources at the relocation facilities. Adler and Bath (2/23 Testimony), ff. Tr. 18975, pp. 28-29.^{70/}

290. Pre-establishment of a fixed number of beds for evacuating patients simply is not feasible since, as a practical matter, daily hospital bed occupancy varies from day-to-day as does the seriousness of the illnesses being treated. Rather, Dauphin County has an established information system which allows the County to determine bed availability, patient allocation, and the need for additional hospital beds^{71/} in a timely manner at the time of an evacuation, the point when such information is needed. Adler and Bath (2/23 Testimony), ff. Tr. 18975.

^{70/} A number of the designated relocation hospitals are members of a health care consortium which can provide a patient census update for these facilities immediately upon request. Board Ex. 6, at Annex K, Appendices 4, 5.

^{71/} The Commonwealth maintains numerous package disaster hospitals with provisions for erecting them if, during an evacuation, available relocation hospitals do not fully meet the hospital bed needs. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 30.

at 29. Consequently, we find no need for a predesignation of the number of available hospital beds for relocating evacuated patients and we reject Contention EP-16(K).

10. Post-Evacuation Support

291. With regard to support for evacuees after an evacuation, Contention EP-13 asserts:

The evacuation plans for Cumberland, York, and Lebanon Counties are based, at least in part on the assumption that many if not most, evacuees will stay with friends or relatives outside the evacuation zone. This assumption is highly questionable, since during the early days of the still-ongoing TMI-2 accident, after women and children were ordered out of the area within five miles of TMI, many tens of thousands of people outside this area themselves evacuated voluntarily. In the event of another accident at TMI which causes a twenty-mile evacuation, for which each of the five counties expresses preparedness, the resultant voluntary evacuations of persons beyond the 20-mile radius might well mean that there will remain no friends and/or relatives for the 20-mile evacuees to reside with temporarily.

Similar concerns are raised in Contention EP-16(L) which states, with regard to the Dauphin County Emergency Plan:

Appendix 14 of Annex E indicates that within a 5-mile radius there are 24,426 individuals who would require evacuation from the area and there is an assumption made that 50 percent of the individuals would require sheltering. The total number of positions available for sheltering in the Plan equals 6,800. There is an obvious deficiency in the number of sheltering site positions available within the County Plan and until and unless there can be some type of acceptable levels of sheltering, the Plan will remain deficient. Moreover, it is Intervenor's position that there is an error in the addition that appears within this Appendix concerning the total capacity of the shelters and that the figure of 7,625 is in error. Furthermore, it is Intervenor's position that until and unless the Plan of Dauphin County indicates that there are auxiliary emergency power systems located in each one of the sheltering systems and

emergency auxiliary heating systems at such sheltering locations, the Plan will remain deficient.

Finally, Contention EP-14(EE) asserts:

The mass evacuation centers contained in the York County Plan do not state that the centers have auxiliary backup electrical power and heating plants in the event that they are placed into use. It is Intervenor's contention that, without such auxiliary power and heating systems, that the Plan is deficient in that evacuees would arrive either at a darkened or cold evacuation center.

These contentions, together, raise concerns about the number of mass care spaces being provided for evacuees and about the planning to provide electricity and heat at the mass care centers.

292. Disaster experience shows that mass care shelters are minimally used by evacuees who, almost universally, do not depend on such shelters. Tr. 17136, 17143 (Dynes). Specifically, surveys of over 100 disasters have shown that fewer than 20% of evacuees have utilized such shelters. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 49. The TMI-2 accident itself demonstrated that, although there were substantial numbers of evacuees, few public shelters were used. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 49.^{72/} The

^{72/} 74 to 81% of persons who evacuated during the TMI-2 accident stayed with relatives and friends and the maximum number of persons at any mass care center on any day was 180, confirming that mass care centers are minimally used. Zeigler, ff. Tr. 21818, at 9.

evidence establishes that the present planning^{73/} to provide mass care centers for 50% of the evacuating population of the TMI plume EPZ is conservative and should be more than adequate. Id. at 49-50; Lothrop, ff. Tr. 17996, at 3. Accordingly, we find no basis for the assertions that planning for the number of mass care positions is inadequate and we find such assertions in Contentions EP-13 and EP-16(L) to be without merit.

293. As to the assertions in Contentions EP-16(L) and EP-14(EE) that mass care centers should be provided with auxiliary emergency power and heating systems, we note at the outset that NUREG-0654 does not even call for the establishment of mass care centers in an emergency, let alone stipulate that centers which are established must have emergency electric power and heating provisions. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 64; Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 51. In any event, there appears to be no need for emergency electric and heating systems at mass care centers. We have previously alluded to evidence indicating that an emergency at TMI will not necessarily result in the loss of power to areas surrounding TMI. In the event that there were a loss of power or heating in certain mass care centers,

^{73/} The figure in the Dauphin County Emergency Plan of 6800 shelter positions, referenced in Contention EP-16(L), is for only one of eight reception centers planned for by Dauphin County. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 50. The Dauphin County Emergency Plan identifies 64000 shelter positions which should be far above what will actually be needed. Curry et al., ff. Tr. 20787, Wertz Testimony at 2.

sufficient numbers of centers have been provided that relocation of evacuees from mass care centers that have lost power or heat to unaffected mass care centers could be accomplished. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 51. Beyond that, if power were lost to certain mass care centers, it would also be lost to residents and commercial and industrial entities in the same area. In such circumstances, efforts to promptly restore power can be expected. Id. On balance, we simply find no basis in the record for requiring emergency power and heating provisions for mass care centers. Thus, we reject those assertions in Contentions EP-16(L) and EP-14(EE) that such auxiliary electric and heating services should be provided.

294. Contention EP-16(A) states:

The Dauphin County Plan, in Section V, makes the assumption that persons evacuated from a risk area will only have to remain outside of the risk area for a period of three (3) days and that adequate lead time will be available to implement the provisions of the Plan. It is Intervenor's contention that a plan based upon these assumptions is inadequate based upon past experience. In the past it has been recognized that a five (5) day selective evacuation was ordered by the Governor of Pennsylvania and that basing an assumption upon a three (3) day sheltering is a defect within the Plan itself. Moreover, there is no definition as to adequate "lead time" and whether or not a definition of that term would mean a short period of time or a relatively long period

of time, and until or unless the term is specifically defined, the Plan is deemed to be inadequate.^{74/}

In a similar vein, Contention EP-16(S) asserts that:

The Dauphin County Plan is deficient in that there is no long-term management provision in the event of an evacuation which would last greater than three days. Without such long-term planning, there is a possibility and probability that confusion would reign after an evacuation of three days and it is submitted that in the March 1979 incident, the evacuation lasted for five days. Therefore, until and unless there is greater long-term management planning provided for in the emergency plan, the Plan remains deficient.

Neither the NRC's emergency planning regulations nor NUREG-0654 stipulate any minimum time that must be planned for the exclusion of evacuees from the evacuated area. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 46. The basis for the three day evacuation under current planning for the TMI area is that evacuees can carry with them minimum life support elements (such as clothing and special medicines) sufficient

^{74/} We view the reference to need for "lead time" in the Dauphin County Plan as simply a reflection of the practical realities of emergency planning and response. Lead time prior to effecting a protective action is useful for mobilizing emergency forces and facilities - for example, getting traffic control personnel in place. The absence of traffic control will not prevent an evacuation and the absence of "lead time" will not prevent the taking of protective actions. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 45-46. In fact, the "lead time" available and the status of mobilization of emergency forces will be considered in protective action decisionmaking through the use of the Licensee's evacuation time estimates which account for the status of mobilization in projecting the time it will take to evacuate. Thus, we find no deficiency in Dauphin County planning in the acknowledgment in that County's Emergency Plan that lead time is necessary to fully effectuate the plan.

to sustain them for such a period without being overburdened by having to carry along the life support commodities needed for a much longer period of evacuation. Tr. 17997-98 (Lothrop). If an evacuation lasts longer than three days, the three days currently planned for allows a sufficient and reasonable period of time to resupply essential needs to sustain evacuees beyond the three day period. Lothrop, ff. Tr. 17996, at 3-4. FEMA's experience indicates that an evacuation of the scale envisioned for the TMI area does not necessitate special planning for, or the identification of, resources to sustain evacuees and that the three days planned for will provide ample time to procure additional resources for an evacuation lasting beyond three days. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 46

295. In short, the evidence indicates that the current planning for excluding evacuees from the evacuated area for a period of three days is adequate. There is no evidence indicating a need for pre-planning beyond that period. Consequently, we find Contentions EP-16(A) and EP-16(S) to be without merit.

296. Contention EP-14(II) asserts that:

The York County Plan provides that the American Red Cross would provide for distribution of certain foodstuffs, clothing, and other personal articles. There is no mention in the Plan whether the Red Cross would have at its disposal the estimated foodstuffs required to feed the evacuated population, the cots needed for the sheltered area and the evacuation centers. Until and unless the Plan contains the statement that these items are in storage and available for distribution, it is Intervenor's position that the Plan remains deficient.

The Commonwealth's Emergency Plan sets forth criteria for the establishment of mass care centers and assigns responsibility for mass care support to the Red Cross in conjunction with host counties. Experience demonstrates that the Red Cross and county emergency management agencies together have consistently provided adequately for mass care facilities in actual disasters through resources that were on hand or borrowed. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 38-39. Where mass care centers are located in schools,^{75/} food supplies on hand are usually sufficient for immediate needs. Under York County planning, agreement has been reached for the procurement of additional food supplies through the Pennsylvania Department of Agriculture and the General Services Bureau of Government Donated Foods with the Red Cross authorized to make the necessary requests for foodstuffs. Board Ex. 5, at I-15.

297. From the foregoing, we find no deficiencies in the York County Plan from its failure to contain a statement that the Red Cross has in storage and available for distribution the necessary foodstuffs and cots to support York County mass care centers. There is no evidence of record indicating that such a statement is needed in the York County Plan and we, therefore,

^{75/} All primary mass care centers identified in the York County Plan are schools. Board Ex. 5, at I-5.

find Contention EP 14(II) to be without merit.

11. Medical Facilities and Decontamination

298. As to planning for medical services for victims of a radiological emergency, Contention EP 6(A) asserts that:

There is inadequate provision in the York County Plan for providing medical services for contaminated individuals, for training persons providing these services, and for transporting radiological victims to medical facilities, all as required by N. 0654 Sec. L.

Medical services for radiation victims in York County will be provided by the 18 primary support hospitals identified in the Commonwealth's Department of Health Plan as capable of providing medical care to contaminated persons. The revised York County Emergency Plan includes two hospitals from the State Plan which are proximate to TMI. Curry et al., ff. Tr. 20787, Curry Testimony at 1; Tr. 19429-31 (Bath). The primary support hospitals for York County have hospital disaster plans with specific portions of the plans and procedures directed to the treatment of radiological accident victims. Curry et al., ff. Tr. 20787, Curry Testimony at 1; Tr. 20919-920 (Curry). Proper training for those persons providing medical services to contaminated, injured individuals is provided through the Commonwealth's Department of Health Plan. Adler and Bath (3/16 Testimony), ff. Tr.18975, at 27. In addition, the York County Plan adequately provides for the transport of persons needing medical services, including the victims of radiological accidents, to the medical support facilities. Id., at 28.

299. In sum, the evidence shows that the revised York County Plan (supported by the Commonwealth's planning through the State Department of Health) adequately provides for local hospitals and medical services for persons exposed to radiation. Bath (Attachment 3), ff. Tr. 22350, at 3. Thus, we find Contention EP-6(A) to be without merit.

300. As to the Commonwealth's Emergency Plan, Contention EP-10 states:

Appendix D of the Plan contains reference to the need for the decontamination of radiologically contaminated individuals (p. 16) but does not provide any information as to how many people may be contaminated, the kind and degree of contamination expected or to be planned for, or the number of facilities and medical personnel appropriately trained in decontamination and radiation injury treatment techniques which may be necessary.

While it is true that the Commonwealth has not provided a prediction of the number of individuals who might be contaminated in a radiological emergency at TMI, it is not clear that such a number could be meaningfully estimated and such an estimate, as well as projections of the kind and degree of contamination expected,^{76/} are not called for in the regulatory guidance set forth in NUREG-0654. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 45. At the same time, the Commonwealth's Emergency Plan does identify 228 facilities that can provide decontamination and radiation treatment. In addition, the Commonwealth's Plan sets forth the number of medical personnel trained in decontamination

^{76/} The evidence does indicate that the type of contamination to be expected would involve contamination from beta and gamma emitters. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 45.

and radiation treatment.^{77/} Cox, ff. Tr. 18497, at 2; Adler and Bath supra. In the event that the number of persons requiring radiation treatment exceeds the capacity of the Commonwealth's resources to provide such treatment, the U.S. Department of Energy can be called upon for assistance. Adler and Bath supra. Through the Interagency Radiological Assistance Plan administered by DOE, physicians who practice radiation medicine are available to the Commonwealth. Tr. 18174-75 (Reilly). Thus, we find that the Commonwealth has appropriately identified facilities and trained personnel for the treatment of radiologically contaminated and injured individuals and that federal assistance can be provided to the Commonwealth in caring for and treating radiological emergency victims if State resources prove to be inadequate. In these circumstances, we find Contention EP-10 to be without merit and we reject it.

301. Also with regard to the resources available for the care and treatment of radiological accident victims, Contention EP-14(JJ) asserts that:

The York County Plan provides that there would be care provided for victims of radiation exposure; however, there is no statement that there are supplies on hand for radiation care or that there are sufficient numbers of supplies on hand to take care of a large mass evacuation in the event that there was a radiation leak. It is Intervenor's contention that, in order to provide sufficient medical care for the populace at risk, it is necessary that the Plan contain statements that inventories are available and are presently in place. Without such statement, the Plan remains defective.

^{77/} Additional training in this regard has been developed by the Commonwealth (Cox, ff. Tr. 18497, at 2) and is now being given. Tr. 18554 (Cox).

The evidence shows that there is no need for explicit statements in an emergency plan on medical supplies and inventories. The York County Emergency Plan lists those hospitals in the TMI area identified by the Commonwealth as "capable of providing medical support to contaminated/irradiated individuals." Board Ex. 5, at J-3. Care for victims of large doses of radiation will be provided at these facilities identified as having the capability to treat radiation victims and those facilities have the necessary equipment and supplies. For victims receiving significant but not large doses of radiation, initial care and treatment is normally limited to diagnostic treatment involving blood samples and other testing procedures. The medical supplies required for such procedures are routinely available at any hospital. Adler and Bath (2/23 Testimony),ff. Tr. 18975, at 30-31. Beyond this, State inventories of needed medical supplies may be relied upon in a radiological emergency as the Commonwealth's Department of Health's Emergency Plan specifically provides for the distribution of critical medical supplies by the Department of Health. Commonwealth Ex. 2A, Appendix 9, §IX.C.4 at 12; §IX.C.7 at 13. In these circumstances, we find no deficiencies in the failure of the York County Emergency Plan to contain statements on the availability of emergency medical supplies. Thus, we reject Contention EP-14(JJ).

302. In Contention EP-14(K) it is asserted that:

Appendix 3, Annex A, Situation Analysis Group, of the York County Plan provides that it will support the State Bureau of Rad. Health with available personnel and equipment and that in the event of a general evacuation on request it will support fire and mass care operations with monitors for decontaminations. Nowhere in the Plan does it state that the Situation Analysis Group will have the necessary equipment required in order to support the various bureaus and fire and mass care operations with the necessary equipment monitors for decontamination operations.

In a similar vein, Contention EP-14(S) states, in part:

The Plan also contains a concept that the county would distribute radiological monitoring equipment to individual fire companies to be monitored by the fire company personnel. There is no indication in the Plan that volunteer firemen have been trained to operate such equipment and there is no assurance that such equipment is presently located within the county for distribution. Until these deficiencies are resolved, it is Intervenor's position that the Plan is deficient.

At the outset, we note that the revised York County Plan does not define a "Situation Analysis Group" or assign responsibilities to it. In addition, under the revised planning, the County will not supply personnel or equipment for use by State bureaus or agencies for field monitoring in relation to accident assessment and dose projection^{78/} but will rely upon BRP for that function. Board Ex. 5, at R-1, §II.A. The revised County Plan does specify, however, that the County will provide for radiological monitoring and decontamination of members of the public at mass care centers if such services prove to be necessary. Board Ex. 5, at I-3, R-1.

^{78/} Under the Commonwealth's planning, the counties are not expected to provide field monitoring teams for accident assessment and dose projection functions. Commonwealth Ex. 2A, §VII.B.1.hh at 28.

303. The revised York County Plan provides that, upon the arrival of evacuees at mass care centers, trained radiological monitoring personnel will monitor and decontaminate evacuees and their possessions (including vehicles) if advised to do so by BRP. Board Ex. 5, at R-3. The Plan itself sets forth the procedures to be used for personnel monitoring, including specific procedures for use of the monitoring equipment and criteria for determining whether contamination exists (Board Ex. 5, Annex R, Appendix 1), and procedures for decontaminating contaminated individuals (Board Ex. 5, Annex R, Appendix 5). The Plan also contains a specific listing of all radiation monitoring survey equipment on hand in the County. Board Ex. 5, Annex R, Appendix 6. Radiation monitoring survey equipment has been distributed to five fire companies within the TMI plume EPZ in York County and to 27 additional fire companies within 5 to 10 miles of the plume EPZ boundary in York County. Board Ex. 5, at R-17. Provisions also have been made for the distribution of 50 additional radiological survey meters from PEMA stockpiles if there is a need for additional equipment for monitoring at mass care centers. Board Ex. 5, at R-18. Thus, previously existing shortfalls in radiological monitoring survey equipment for the County have been eliminated. Bath (Attachment 3), ff. Tr. 22350, at 4. We find that the York County Emergency Plan does, in fact, provide assurance that the necessary monitoring equipment for decontamination operations at mass care centers will be available when needed.

304. As to training for personnel who will perform monitoring and decontamination functions at mass care centers, we note the York County Plan itself contains rather extensive and self-explanatory instructions on how to monitor individuals and the methods of decontamination. Board Ex. 5, Annex R, Appendices 1, 5. The Commonwealth's training program provides for the training of fire company personnel in the use of radiological monitoring equipment and extensive training has been provided to such personnel in the past in this regard by the U.S. Department of Transportation and by the Defense Civil Preparedness Agency. Adler and Bath (3/16 Testimony) ff. Tr. 18975, at 33. In addition, York County provides a home study training program for the use of radiological monitoring equipment. Curry, et al., ff. Tr. 20787, Curry Testimony at 4. Extensive training has been conducted through this program and over 100 trained radiological monitoring personnel are now available for York County. Tr. 20931 (Curry). From this we find that there is, indeed, assurance that personnel trained in the use of radiological monitoring survey equipment will be available for monitoring and decontamination functions at mass care centers.

305. In sum, we find that York County planning has provided adequate quantities of radiological monitoring equipment and adequate numbers of personnel trained in its use to support the monitoring and decontamination of evacuees at mass care centers as called for by the York County Emergency Plan. Accordingly, we find assertions to the contrary in Contentions EP-14(K) and EP-14(S) to be without merit.

306. As to York County's planning for the monitoring and decontamination of vehicles during an evacuation, Contention EP-14(Z) asserts that:

The York County Plan provides for the decontamination of personnel and vehicles and Subsection C of that Plan provides that all vehicles passing through a designated reception center will be decontaminated and also that all vehicles that will be on major routes leaving the county will be decontaminated. The inclusion of this in the Emergency Plan of York County renders the Plan deficient and inoperable. It is Intervenor's position that, by decontaminating vehicles and personnel at the designated locations as set forth in the Plan will only cause the projected traffic flows to be severely diminished as a result of the decontamination. The Plan is deficient also because there is no projection as to the number of cars that would be able to travel on the evacuation routes after the initial jam-up occurs at the decontamination routes. In other words, the decontamination areas will provide a bottleneck for the evacuation of area residents out of risk areas that will effectively render the evacuation plan inoperable. Unless the decontamination points are removed to some other point besides the major evacuation arteries, it is submitted that the Plan is deficient.

Contrary to the assertions in this contention, the revised York County Plan does not provide that all vehicles on major routes leaving the County will be decontaminated. Rather, it provides that, on the advice of BRP, monitoring and decontamination will be performed at mass care centers with initial monitoring and decontamination of evacuees themselves, followed by monitoring and decontamination of vehicles where they are parked when time permits.^{79/} Board Ex. 5, §IV.C.2 at R-3, §IV.B at R-14.

307. All mass care centers for York County will be located at distances greater than 10 miles from the outer edge of the plume EPZ. Because of this distance and the parking space provided at the mass

^{79/} Provisions for the decontamination of evacuation vehicles are not called for by the criteria of NUREG-0654. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 43.

care centers, monitoring and decontamination at the centers should not cause traffic backups affecting egress from the plume EPZ in any way. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 44. Consequently, we find Contention EP-14(Z) to be wholly without merit and we reject it.

12. Distribution and Administration of Potassium Iodide (KI)

308. A number of contentions have been raised concerning the distribution and use of radioprotective drugs, specifically potassium iodide (KI), during a radiological emergency.^{80/} KI, if taken before radioiodines are ingested, can serve to substantially reduce the radiation dose to the thyroid by saturating the thyroid and blocking its uptake of radioiodine. Beyea, ff. Tr. 18350, at 6; Commonwealth Ex. 2A, Appendix 9, at I-1. Recognizing the effectiveness and usefulness of KI for thyroid blocking in a radiation emergency, the U.S. Food and Drug Administration (FDA) invited submissions of "New Drug Applications" for KI in oral

^{80/} The Staff had raised a concern about the Licensee's provisions for the use of radioprotective drugs for emergency workers onsite and had recommended that the Licensee be required to establish provisions for stockpiling thyroid blocking drugs. Staff Ex. 6, at 30. The Licensee has, however, stockpiled sufficient thyroid blocking drugs onsite to sustain onsite emergency workers for several weeks and has developed guidelines for the use of the drugs. Tr. 14626-27, 13771-72 (Giangi). The Staff has confirmed the existence of a stockpile of KI for emergency workers onsite and of Licensee-approved procedures for use of the drug. Staff Ex. 23, at II-9. This matter has, thus, been resolved.

dosage forms for use in a radiation emergency^{81/} and approved two "new drug applications" for the production of KI in tablet and in liquid form for use in a radiological emergency only.^{82/}

309. Intervenors have argued, through testimony, that prior to restart of TMI-1, KI should be predistributed to all residents of the plume EPZ for use in a radiological emergency. *Beyea* ff. Tr. 18350, at 6, 8-9. The Pennsylvania Department of Health, however, has established a policy that will limit distribution and use of KI to persons who cannot be evacuated quickly (*Cox*, ff. Tr. 18497, at 1), specifically: offsite emergency response organizations operating within the plume EPZ (including policemen, firemen, ambulance personnel and emergency management personnel) and the Staff and patients or residents of selected institutions within the plume EPZ (including those in hospitals, nursing homes and prisons). Commonwealth Ex. 2A, Appendix 9, at I-3. The Commonwealth's policy on KI use was developed from considerations of the toxicity level of KI and the incidence of allergic and adverse reactions to it, concerns over the unauthorized use of KI by children if it were distributed to the general public, the shelf life of the drug, and its cost.

^{81/} Potassium Iodide as a Thyroid - Blocking Agent in a Radiation Emergency - Request for Submission of New Drug Applications and Notice of Availability of Labeling Guidelines, December 15, 1978, 43 FED. REG. 58798 (ff. Tr. 18577).

^{82/} Potassium Iodide for Thyroid Blocking in a Radiation Emergency Only; Approval and Availability, February 22, 1980, 45 FED. REG. 11912 (ff. Tr. 18577). The approval was for KI "as a thyroid blocking agent for use as directed by State or local public health authorities in the event of a radiation emergency only."

Tr. 18507, 18516-17 (Cox); Cox, ff. Tr. 18497 at 1. Counties within the plume EPZ for TMI have modified their emergency plans to reflect the Commonwealth's policy on KI use. Tr. 18552 (Cox). Thus, we are faced with a State KI distribution policy and plan which conflicts with a policy of distribution to the general public advocated by the intervenors.

310. While the NRC's emergency planning regulations require that a range of protective actions be developed for the public in the plume EPZ (10 CFR §50.47(b)(10)), they do not specifically require that protective actions for the public include the use of radioprotective drugs. Guidance in NUREG-0654 indicates that planning for protective actions should include provisions for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons within the plume EPZ, and that State and local emergency plans should include a method by which the State health department may decide whether to administer radioprotective drugs to the general public during an emergency. Staff Ex. 7, at 61, 63, Criteria J.10.e, J.10.f; Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 33. This guidance does not impose mandatory requirements which must necessarily be followed in any particular emergency plan. We deem to be controlling in this regard the Commission's directions to the NRC Staff contained in a memorandum on thyroid blocking, dated March 26, 1981, from Samuel J. Chilk, Secretary of the Commission, to William J. Dircks, Executive Director for

Operations.^{83/} In that memorandum, the Commission requested that the Staff continue to work with FEMA, FUA and the Environmental Protection Agency to address uncertainties in the use of KI by the general public. The Commission further indicated that the Staff was to continue to work on source term methodology studies then underway, that until the results of those studies were presented, the Commission will make no further decisions regarding the advisability of recommending the stockpiling of KI for the general public, and that, in the interim, the Staff should assure with FEMA that there is appropriate guidance for administration of KI before requiring implementation for certain institutionalized members of the public. Chilk Memorandum, ff. Tr. 20394. This Memorandum establishes, we believe, that use of KI by the general public is not a regulatory requirement and that the Commission has not yet determined whether such use is even advisable.

311. In these circumstances, we cannot find fault with the Commonwealth's determination that radioprotective drugs will not be distributed or administered to the general public. The Commonwealth's policy was developed by the Department of Health, the State agency most directly responsible for providing for the health of citizens within the State, based on a detailed consideration of a number of factors including the potential for adverse and possibly serious reactions to KI by limited numbers of

^{83/} Pursuant to an agreement of the parties, we have taken official notice of that memorandum as well as of then - Chairman Hendrie's March 25, 1981 letters to the Director of FEMA and the Acting Commissioner of Food and Drugs at the FDA requesting studies and guidance from those agencies on the use of KI by the general public. Tr. 20394.

persons. Since the Commonwealth has made a predetermination that it will not distribute KI to the general public and has made detailed plans for the predistribution of KI to emergency workers and institutionalized persons, State planning is consistent with the guidance and criteria of NUREG-0654. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 34-35. Accordingly, we reject the Intervenor's assertions that provision must be made, prior to restart, for administration of KI to the general public within the plume EPZ.

312. The Commonwealth's Emergency Plan contains detailed provisions for the distribution of KI to State emergency response agencies and organizations (Commonwealth Ex. 2A, App. 9, at I-5, I-6) and for predistribution to risk counties in the TH1 plume EPZ. Id., App. 9 at I-6 to I-9. Specific numbers of KI units to be distributed to Lancaster and Lebanon Counties are listed for each emergency organization and institution in those counties that are to receive KI. Although the current version of the State Department of Health's Emergency Plan does not contain similar explicit listings of KI doses for emergency response organizations and institutions in Cumberland, York and Dauphin Counties, such lists have been completed and are set forth in the respective county plans. Tr. 22420-21 (Bath); Board Ex. 5, at R-23 to R-28; Board Ex. 6, at N-22 to N-29; Board Ex. 8, at N-22, N-23. The State Plan also sets forth criteria for ordering the administration of KI to emergency workers and institutionalized persons and provisions for notifying all emergency response organizations and institutions as to when KI should be administered. Commonwealth Ex. 2A, App. 9, at I-4, I-5.

313. Specific contentions on the use of thyroid blocking drugs are directed primarily to the planning for distribution of KI. In this regard, Contention EP-5(A) asserts:

The Commonwealth's plan for distribution of a thyroid blocking agent to persons at risk in the event of a nuclear accident with offsite radiological consequences (Pa. Dept. of Health RERP, App. I) is deficient for the following reasons:

1. The plan assumes an advance warning time (1 hour; p. 2) that is in excess of that which NUREG-0654 concludes may be available before an initial release of radioactive materials to the environment.
2. The postulated warning time is that which is deemed the minimum necessary to enable Dept. of Health officials "to move ahead of evacuees in their distribution efforts." However the plan is silent with respect to the much more critical time period that would actually elapse between the initial notification of the Commonwealth of an emergency situation and the availability to the public of the medication. ANGRY submits that given the logistics of the distribution process as set forth in the plan such a time period would be well in excess of one hour. The "assumption" stated in Sec. IVA(1), p. 13, of the distribution plan is unsupportable as a planning basis.
3. In the case of York County, the movement of large numbers of people to the single designated distribution point for the medication, the County Courthouse, would require complete departure from predetermined evacuation routes, particularly for residents of Fairview and northern Newberry Townships. It would also cause massive traffic congestion in the center of York City.
4. The plan would be useless in the event of a nuclear emergency for which sheltering was the chosen protective action. It is also useless to those farmers who "consider evacuation unfeasible and elect to seek or use sheltering for themselves ..." (Pa. Dept. of Agriculture Plan, p. 17). The stated condition to the advice to "take prescribed dosage of SSKI" (Ex. 9 to App. 1, Sec. 3(c)), namely, its availability, would of course not be met under the plan as presently outlined.

For all the foregoing reasons ANGRY submits that the only method of distribution capable of insuring the availability of a thyroid blocking agent is its predistribution to all

potentially affected households and businesses, and that such predistribution should be accomplished prior to the restart of TMI-1. (Emphasis in original).

In a similar vein, with regard to the York County Plan provisions for the distribution of thyroid blocking agents, Contention EP-14(C) states, in part:

Subsection (c) of this Plan also provides that a County Medical Officer will coordinate with the Pennsylvania Department of Health the distribution of thyroid blocking agents and other radiological health materials. The assumption is that these materials would be stored in an area in close proximity to the affected area without any assurance that such thyroid blocking agents and other radiological health materials are even available and could be delivered to the Exit 6 area of I-83 within a timeframe that would be sufficient to effect the Plan.

Both of these contentions assert inadequacies in the planning for distribution of thyroid blocking drugs to the general public and were formulated and admitted as issues at a time when plans were indeed directed to such distribution. As previously discussed, the Commonwealth has determined that it will not provide for the administration of thyroid blocking drugs to the general public. We have found the Commonwealth's policy in this regard to be consistent with NRC guidance and to be acceptable.

314. Since thyroid blocking drugs will not be distributed to the public, the problems with regard to public distribution identified in these contentions will not exist. Thus, there is no need for lead time to effect distribution of KI to the public, evacuees will not be held up in their evacuation or directed to specific locations to

obtain KI, and members of the public who have been advised to shelter will not be asked to leave shelters to obtain KI.

Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 37. In the same vein, there is no need for provisions in the York County Emergency Plan for the delivery of KI to public distribution points. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 38-39. Accordingly, we find Contention EP-5(A) and that portion of Contention EP-14(C) directed to the distribution of KI to be without merit.

315. Contention EP-6(E) asserts that :

The provisions in the York County plan for thyroid blocking agent distribution (Annex A, App. 3, Health-Medical Operations) are not coordinated with the state plan.

With the revision of State policy on the distribution and use of KI, a revised KI distribution plan was developed by the Commonwealth and coordinated with the risk counties. Cox, ff. Tr. 18497, at 1. In turn, KI distribution plans for the risk counties, including York County, were revised and are now wholly consistent with the State Emergency Plan provisions for KI distribution. Tr. 20797 (Curry); Bath (Attachment 3), ff. Tr. 22350, at 1. We, therefore, find Contention EP-6(E) to be without merit and we reject it.

316. As to the York County Plan, Contention EP-14(M) asserts that:

Appendix 3, Annex A, Health medical Operations, provides that that group would be prepared to assist the State Department of Health in the distribution of thyroid blocking and other radiological health materials. Nowhere in the Plan is it stated that these materials are readily available and until and unless the Plan specifically designates that these materials are located within the York County area, it is Intervenor's contention that the Plan is deficient.

Under the revised State and York County Emergency Plans, KI will be predistributed in predetermined amounts to the York County Emergency Management Agency, to the emergency management agencies of each of the 14 municipalities within the York County portion of the TMI plume EPZ, and to 16 fire companies, 12 ambulance services, and 11 police departments in the plume EPZ for York County.

Commonwealth Ex. 24, Appendix 9, at I-9; Board Ex. 5, at R-23 to R-28. With such predistribution, State assistance in the actual physical distribution of KI in York County during an emergency is not necessary.

317. Although the Department of Health's Emergency Plan states that KI was to be predistributed to the counties by June 1981 (Commonwealth Ex. 2A, App. 9, at I-6), the Commonwealth has experienced difficulties in procuring KI in suitable form and we have no evidence indicating that predistribution to the counties has yet been accomplished. As reflected in the Commonwealth's Plan, the State had originally planned to procure KI in tablet form. Subsequent planning to obtain the drug in liquid form was abandoned and the Commonwealth is now seeking to procure KI in tablet form for distribution in accordance with the State's Emergency Plan provisions. Tr. 22767 (Adler). The KI currently available in tablet form has a shelf life which expires on December 31, 1981 although that shelf life may be extended. Tr. 22768 (Adler). The Commonwealth has every intention of securing KI in tablet form and is continuing its efforts to do so. Bath (Attachment 3), ff. Tr. 22350, at 1. We are confident that the Commonwealth will continue

in its efforts to procure KI until suitable KI is obtained at which time it will predistribute the drug in accordance with the provisions of the Commonwealth's Emergency Plan. At this time, however, we find no deficiencies in the York County Plan for its failure to state that thyroid blocking drugs are located within the York County area. Thus, we reject Contention EP-14(M).

13. Farmers and Livestock

318. A number of contentions have been raised concerning measures to protect farmers and livestock during a radiological emergency. In this regard, Contention EP-2 states:

It is contended that present evacuation plans do not provide for care and/or relocation of livestock. It is further contended that such provision should be made before restart of TMI-1.

Similarly, with regard to the Licensee's Emergency Plan, Contention EP-4(A) asserts that:

There is no provision in the EP for the prevention of damage to property (e.g., livestock) in the area surrounding the plant site as required by Appendix E to 10 CFR 50, §^s II(C), III, and IV(C).

At the outset, we are constrained to note that the NRC's new emergency planning rules and guidance are directed to measures to protect public health and safety and do not require explicit planning for the protection of property.^{84/} As shown in the

^{84/} The reference in Contention EP-4(A) to parts of Appendix E to 10 CFR Part 50 is misplaced. None of the referenced sections in the new Appendix E, which became effective on November 3, 1980, relate in any way to requirements for the protection of property. Chesnut, ff. Tr. 15007, at 67.

Statements of Consideration accompanying the new emergency planning rules, the Commission had considered imposing regulations requiring an outline of "corrective measures to prevent damage to onsite and offsite property."^{85/} The Commission determined not to impose such requirements "because public health and safety should take clear precedence over actions to protect property. Measures to protect property can be taken on an ad hoc basis as resources become available after an accident." 45 FED. REG. 55402, 55407. Consistent with this, Licensee, State and county emergency plans are directed toward protecting persons rather than property (Rogan, et al., ff. Tr. 13756, at 113) and the absence from any of these plans of specific provisions which will assure the protection of property, including livestock, is not a planning deficiency. Chesnut, ff. Tr. 15007, at 67-68; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 50.

319. Nevertheless, extensive information on measures that may be taken to protect animals and livestock is presented in the Pennsylvania Department of Agriculture's Plan. Rogan et al., ff. Tr. 13756, at 113; Commonwealth Ex. 2A, Appendix 7. The Department of Agriculture's Plan allows farmers to remain on their farms to care for their livestock during a general evacuation, to evacuate themselves and their families, leaving their livestock behind and notifying the county agricultural agent of the situation, or to evacuate livestock if the livestock is not diseased. Tr. 18845-46 (Furrer).

^{85/} Emergency Planning - Final Rule," 45 FED. REG. 55402, 55407 (August 19, 1980).

320. Substantial guidance to the farmer for the protection of his livestock and poultry is set forth in Annex B to the Department of Agriculture's Plan. This information, designed in the form of reproducible fact sheets, as well as information on the protection of food in the main body of the Department of Agriculture's Plan, was to be distributed by the State Department of Agriculture to all farmers within the TMI plume EPZ by about mid-July of 1981. Tr. 20421-22 (Furrer). The guidance on the protection of livestock emphasizes sheltering of livestock and the use of stored feed and water in the event of a radiological emergency (Van Buskirk and Cable, ff. Tr. 18296, at 1-2), providing information on suitable shelters, radiation attenuation factors from various types of shelters, measures to augment sheltering capabilities, priorities for sheltering certain types of livestock, required space and ventilation for sheltered livestock, measures to provide protected feed and water to sheltered livestock, and specific measures for the protection of dairy cows, beef cattle, sheep, swine and poultry. Commonwealth Ex. 2A, Appendix 7, Annex B, at 4-21. Testimony from several farmers and local veterinarians who reviewed the guidance provided in the Department of Agriculture's Plan indicates that various recommendations related to sheltering may not be practical for all farms in the TMI area. Tr. 18738 (Lytle); Tr. 18766-67 (Samples). The Department of Agriculture itself candidly admits that it may be impractical, if not impossible, to provide shelter and care for all livestock. Commonwealth Ex. 2A,

Appendix 7, Annex B, at 6. Nevertheless, we find that extensive and detailed guidance has been provided which should allow farmers to provide some form of sheltering protection for their livestock in the event of a radiological emergency.^{86/}

221. Further guidance advises farmers to report their status to the county agricultural agents or county emergency management agencies in the event that an evacuation is ordered. Van Buskirk and Cable, ff. Tr. 18296, at 2. Although the Commonwealth's planning does not provide a means for the evacuation of livestock (Van Buskirk and Cable ff. Tr. 18296, at 3; Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 50),^{87/} it does provide a means whereby evacuating farmers may arrange for assistance in caring for livestock left behind. Van Buskirk and Cable, ff. Tr. 18296, at 2; Tr. 18883-84 (Furrer). Such assistance would be arranged through the county agricultural emergency boards, the U.S. Department of Agriculture, and the State

^{86/} Provision has been made for notifying farmers of the need to shelter livestock through pre-prepared EBS messages to be broadcast during an emergency. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 50.

^{87/} Farmers may evacuate their herds without prior authorization from the Commonwealth provided that the herd has not been quarantined. Tr. 18314 (Van Buskirk). Although the evidence indicates that it probably will not be possible to evacuate all herds in the TMI plume EPZ on short notice, such an evacuation could be accomplished over a period of several days. Tr. 18822-23 (Weber). In this regard, there are a number of commercial livestock haulers in the TMI area and many local farmers have their own livestock trucks that can be used to relocate a limited number of livestock. Tr. 20234 (Stewart). Thus, the means for a limited evacuation of livestock (possibly of the most valuable livestock on specific farms) exist, even on short notice.

Department of Agriculture which itself has 57 officers throughout the State, most of whom are farmers, who could be diverted to provide assistance in an emergency. Tr. 18853, 18850-51 (Furrier); Tr. 18302-303 (Cable). In addition, farmers who evacuate may be permitted to return periodically to care for their livestock. Tr. 18333 (Van Buskirk). Thus, while evacuation of livestock has not been provided for, provision has been made for arranging for emergency care for livestock left behind by evacuating farmers. We find no planning deficiencies in the failure to provide a means for evacuating all livestock in the plume EPZ.

322. In sum, we find that present planning does provide for care for livestock in a radiological emergency and that substantial guidance and information is provided to the farmer that will allow him to minimize damage to his property in this regard. Consequently, we find Contentions EP-2 and EP-4(A) to be without merit and we reject them.

323. Contention EP-5(G) asserts that:

The Commonwealth's Dept. of Agriculture Plan is inadequate for the reason that it provides no information on measures for the self-protection of farm personnel who "consider an evacuation unfeasible and elect to seek or use sheltering for themselves . . ." (p. 17). The plan offers the farmer no choice between the two extremes of exposing himself to potentially dangerous levels of radiation or ^{88/}complete abandonment of his investment in his livestock.

88/ Contrary to the assertions in this contention, information on self-protection of farm personnel is contained in Section V of the Department of Agriculture's Plan which specifically discusses evacuation, sheltering and protective action selection for farm operators. Commonwealth Ex. 2A, Appendix 7, Section V, at 15-17.

The same information on self-protective measures that is available to the general public is also available and applicable to farmers. Van Buskirk and Cable, ff. Tr. 18296, at 4. In this regard, we have previously addressed in some detail the emergency information pamphlets prepared by the Commonwealth and the five counties within the TMI plume EPZ as well as the Licensee's commitment to distribute those pamphlets to all residents of the plume EPZ. Through this means, farmers in the area should have access to necessary information on protecting themselves and their families in a radiological emergency. In addition, the county agricultural agent, an emergency worker, will work closely with farmers during an emergency, providing advice on self-protection as well as advice on measures to protect livestock. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 47-48. As previously mentioned, information on the protection of foodstuffs and use of contaminated food, as set forth in the Department of Agriculture's plan, is also to be distributed to farmers in the TMI plume EPZ. In this regard, State milk sanitarians will contact dairy farmers in an emergency to provide information on the possible contamination of milk (Tr. 20407 (Fouse)) and farmers who get their milk from their own cows will be similarly advised (Tr. 20417-18 (Fouse)). In summary, we find no merit in Intervenors' assertions in this contention that measures have not been taken to provide farmers with information and advice on self-protection in a radiological emergency.

324. Beyond this, we do not agree with the assertion that farmers are left with the choice of two extremes - exposing themselves to radiation or abandoning their investments in their livestock. Protective measures in the form of sheltering are available to the farmer. Commonwealth Ex. 2A, Appendix 7, at 15-17. In addition, we have previously discussed the arrangements that can be made to provide care for livestock in the event that the farmer decides to evacuate. Such arrangements for care can help to preserve livestock left behind by evacuating farmers and thus reduce the possibility that evacuation by the farmer will result in a total loss of his investment in his livestock.^{89/}

325. In sum, we find the planning inadequacies alleged in contention EP-5(G) to be nonexistent. We, therefore, reject that contention.

326. Contention EP-14(BB) states

Annex R of the York County Plan does not provide for any evacuation of domestic farm animals and until and unless the Plan does provide for a plan of evacuation, the Plan remains deficient. Domestic farm animals cannot be left for any period of time without human care and attention and, therefore, it is assumed that farmers who have such large investments in livestock will not leave their investment unattended and, thus, they are left at risk. Moreover, the agricultural part of the York County Plan provides that the County Emergency Management Agency Director will charge and distribute dosimeters for agricultural personnel who are required to enter the designated risk area but does not state who will provide the dosimeters and who will interpret the dosimeter readings. Until and unless these two facets of the York County Plan are remedied, it is Intevenor's contention that the Plan remains deficient.

^{89/} Farmers from the TMI area testified that the State Department of Agriculture's plan to arrange for care of livestock would be a factor in the farmers' determination as to whether they themselves would evacuate in an emergency. Tr. 18728 (Lytle); Tr. 18730 (V. Fisher).

We have previously addressed the fact that existing emergency plans do not provide for the evacuation of livestock. We have also discussed the information provided to the farmer on how he can protect himself and his farm animals in the event of a radiological emergency. Protective measures for farm animals are available, and, together with arrangements for continuing care for farm animals, can serve to reduce losses of animals left behind when it is necessary for farmers to evacuate. Thus, we have found that the failure of emergency plans to provide for the evacuation of domestic farm animals does not constitute a planning deficiency under the emergency planning regulations.

327. As to the assertions in Contention EP-5(G) with regard to dosimetry for agricultural personnel, the revised York County Emergency Plan specifically provides that each emergency worker^{90/} in the County will be supplied with two self-reading dosimeters and one TLD. Board Ex. 5, at R-2, R-3, R-4. Explicit instructions on use of the personal dosimetry are set forth in the plan. Id., Annex R, Appendix 3. The self-reading dosimeters will be interpreted by the emergency workers themselves whereas the TLDs will be read by BRP. Id. at R-10.

^{90/} Farmers are not considered to be emergency workers and will not necessarily be given dosimetry. Tr. 16089 (Chesnut); Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 50. However, since farmers who evacuate may be permitted to return to the evacuated area, under the control of local officials, for livestock maintenance purposes (Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 51), it is possible that dosimetry will be issued to them in certain circumstances.

328. Under the York County Emergency Plan, the self-reading dosimeters will be provided to emergency workers by the York County Emergency Management Agency through radiological equipment kits which have been pre-distributed to fire companies throughout York County or from a stockpile maintained in the County Emergency Management Agency storeroom at the EOC. Id. at R-15, R-17, R-18. One-thousand additional self-reading dosimeters have been reserved by PEMA for York County's use and PEMA is currently attempting to procure 1000 TLDs which will be reserved for York County. Id. at R-16, R-18. Thus, the York County Emergency Plan does indicate the source of the dosimetry to be provided to York County emergency workers, including those agricultural personnel who are considered to be emergency workers. The evidence also indicates that a sufficient quantity of self-reading dosimeters is in stock (Tr. 22427-28 (Bath)) and that efforts are being made to procure TLD dosimetry which the Commonwealth has committed to supply. Commonwealth Ex. 2A, App. 8, at XIV-3. Thus we find no merit in the assertions made in this regard in Contention EP-14(BB) and we reject that contention.

329. With regard to York County planning Contention EP-6(G) asserts that:

The York County Fairgrounds is an inappropriate location for the agricultural "Information Center" (Annex R, Sec. IVF) since it is within the 20-mile distance from the plant to which under the plan's assumptions a total evacuation may be required. The provision establishing this center fails to provide also for the necessary predetermination by farmers wishing to avail themselves of its services of the nature and timing of the "essential functions" for their farms, the number of persons needed to perform such functions, and the identity of such persons. Dissemination of information concerning this program and the compiling of information provided in response thereto should be accomplished prior to TMI-1 restart.

This contention was directed to an early version of the York County emergency Plan which provided for the establishment of an agricultural information center. The revised York County Plan does not provide for the establishment of such a center. Curry et al., ff. Tr. 20787, Curry Testimony at 2. Moreover, such a center and the public information functions and services it might provide are not called for in emergency planning guidance and criteria. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 63. Such services would simply supplement assets already in place for York County - assets which currently meet NUREG-0654 criteria for public information dissemination. In these circumstances, no further provision for an agricultural information center is necessary. Id. Since planning for such a center is no longer being undertaken and is unnecessary in any event, we find Contention EP-6(G) to be inapposite and we reject it.

14. Coordination

330. Intervenors claim that there is a lack of coordination between the Licensee's planning and the planning of offsite emergency response organizations. Specifically, as to Licensee's Emergency Plan, Contention EP-15(E) asserts that:

Section 4.6.5.1(2) of the Emergency Plan provides that the responsibility for actions to protect persons in the offsite areas rests with the Commonwealth of Pennsylvania and that the Pennsylvania Emergency Management Agency shall be the agency with which the responsibility rests for the placing, in effect, of protective options such as evacuation, sheltering and thyroid prophylaxis. The same section indicates that in the event of a general emergency, precautionary measures may be taken such as sheltering, evacuation and evacuation of certain sectors based upon wind speed and direction. It is again

Intervenor's contention that this particular section of the Emergency Plan providing for the precautionary measures cited have not been coordinated with local county plans to any measurable extent. For example, in the county plans, there is no indication of how the counties would instruct its local Civil Defense Directors to evacuate only certain sectors within a community instead of within radial distances of the Three Mile Island nuclear facility. This is again only but one example of a lack of coordination between the Emergency Plan and the various county plans and it is Intervenor's position that this lack of coordination is symptomatic of the entire Emergency Plan as it is now written. The Emergency Plan submitted by the Licensee should encompass a total coordination of all Emergency Plans formulated by federal, state and county agencies. This lack of coordination creates a deficiency which has to be remedied.

Despite the claims of a general lack of coordination in planning between the Licensee and offsite organizations, only a single instance of alleged conflict in planning has been cited. That instance involves a reference in the Licensee's Emergency Plan to "evacuation of certain areas based on wind speed and direction" which Licensee cites as an "example" of precautionary measures which the Commonwealth could take. Licensee Ex. 30, at 6-14. It is indeed true that the county emergency plans do not contain explicit provisions for sector evacuations. In addition, the evidence indicates that, in general, the Commonwealth will not order a sector evacuation because of the potential for substantial wind shifts in short periods of time, although efforts and resources for evacuation will be concentrated in the direction at greatest risk. Lothrop, ff. Tr. 17996, at 5. However, we do not deem the Licensee's mere reference to a sector evacuation as an example of a possible protective action to be taken by the State as indicative of a general lack of coordination between the Licensee's planning and offsite planning. The fact that the Commonwealth

has indicated a general disinclination for ordering a sector evacuation does not mean that it would never direct such an evacuation, even in specific instances where it determined that a sector evacuation would be appropriate and could be accomplished.^{91/}

331. Contrary to the assertions in Contention EP-15(E), the evidence indicates that there has been substantial coordination of planning among the Licensee, the Commonwealth, PEMA and BRP through meetings, agreements on organization and communications concepts (Rogan et al., ff. Tr. 13756, at 9-10), provisions for Licensee training for offsite emergency response organizations and provisions for testing communications (Rogan et al., ff. Tr. 13756, at 13-14). Coordination efforts were also concentrated in the areas of emergency classification, notification of the counties, protective action recommendations, and the prompt notification system. Tr. 13866-68 (Rogan, Giangi).

^{91/} The Commonwealth's Emergency Plan does contain a discussion of the identification of protective action areas in which it indicates that, in general, a protective action area will include a wedge-shaped sector of about 90° centered in the down wind direction. Commonwealth Ex. 2A, App. 8, at VII-1. As to the capability to effect a sector evacuation, we note that PEMA has directed the five counties in the plume EPZ for TMI to include in their emergency plans maps which show sectors utilized by the Licensee so that sectors at greatest risk could be clearly identified to local emergency response personnel. Incorporation of these sector maps into State and county emergency plans will serve to identify the various sectors on clear and common terms. This, in combination with the direction of coordinated protective actions by PEMA, should provide county and local emergency response organizations with a clear understanding of the areas to be evacuated in the event that a sector evacuation were ordered. Chesnut and Bath ff. Tr. 19626, at 12-13.

Licensee coordination with the five risk counties on communications systems, notification procedures, the prompt alerting system and emergency response resources was accomplished through meetings with the county emergency management coordinators. Rogan et al., ff. Tr. 13756, at 10.

332. From our review of the record, we have not found evidence of significant inconsistencies or conflicts between the Licensee's planning and that of the State and the counties.^{92/} Consequently, we find Contention EP-15(E) to be without merit.

H. Maintaining Emergency Preparedness

333. Several contentions have been raised regarding plans and provisions for maintaining emergency preparedness. These contentions are directed to the major areas of training, provisions for exercises and drills, and provisions for the audit and review of emergency plans.

1. Training

334. As to training for State emergency response personnel, Contention EP-5(F) asserts that:

^{92/} Several inconsistencies, identified by Intervenor in Contention EP-5(E), between the Licensee's Plan and the BRP Plan involving protective action criteria have been resolved through modifications to the BRP and Licensee Plans. Reilly ff. Tr. 18125, at 6; Tr. 18248 (Reilly).

TMI-1 should not be permitted to restart until persons responsible for implementing emergency response plans at all levels of the response network within the plume EPZ have successfully completed the training mandated by H. 0654 Sec. 04 and provided for in Pa. DOP App. 10

NUREG-0654 calls for periodic training for various categories of State and local emergency response personnel who are responsible for implementing radiological emergency response plans. Criterion 0.4(a) calls for training of State and county emergency management coordinators. Staff Ex. 7, at 76. In this regard, specialized training as set forth in the Commonwealth's Emergency Plan, has been provided by PEMA, with the initial round of training completed about mid-April of 1981. Tr. 17939-41 (Lamison). Training for the appropriate county and municipal officials in each of the five counties in the TMI plume EPZ has been completed. Tr. 17972 (Lamison)

335. Provision has been made in the Commonwealth's Emergency Plan for the training stipulated by NUREG-0654, Criterion 0.4(b) for State personnel responsible for accident assessment, and by NUREG-0654 Criterion 0.4(c) for State radiation monitoring teams and radiological analysis personnel. Tr. 17941-43 (Lamison). The State's accident assessment personnel have received training in this regard within the last year and the BRP staff, responsible for radiological monitoring and analysis, was given training in monitoring in the fall of 1980. Tr. 18127 (Reilly). Five separate reactor accident training drills were conducted for BRP accident assessment personnel during April and May of 1981. Bath (Attachment 3), ff. Tr. 22350, Pre-Exercise Training, at 1, 2.

336. NUREG-0654, Criteria 0.4(d), (f) and (g) specify that training is to be provided to local police, security and fire fighting personnel, local first aid and rescue personnel and local support services personnel. Staff Ex. 7, at 76. In this regard, the Licensee's Emergency Plan has been modified to include commitments for training for emergency personnel and the Licensee has committed to complete, prior to restart, one full iteration of emergency organization training including training for offsite support organizations. Chesnut and Bath, ff. Tr. 19626, at 16. Specific training will be provided by the Licensee to local fire companies, ambulance services and police departments to familiarize them with the TMI site and the Licensee's Emergency Plan. Tr. 13842 (Tsaggaris); Staff Ex. 6, at 27; the Licensee's Plan also provides for training for the State Police and the Middletown Police Department on emergency classifications and communication; and training for fire and rescue services on security force interfaces, basic radiological controls, onsite firefighting equipment and communications. These training programs satisfy the NUREG-0654 criteria. Chesnut ff. Tr. 15007, at 72-73. Finally, Radiation Management Corporation (RMC), acting for the Licensee, provides annual training for ambulance and hospital personnel. RMC provided training for local emergency medical personnel from offsite organizations in September of 1980.

Rogan et al., ff. Tr. 13756, at 45, 48. Further training for State and local medical support personnel as specified in NUREG-0654, Criterion 0.4.h is provided by the Pennsylvania Department of Health in accordance with specific medical support training programs set forth in the State Emergency Plan. Tr. 17944 (Lamison).

337. Finally, NUREG-0654 Criterion 0.4(j) stipulates that training is to be provided to State and local personnel responsible for transmission of emergency information and instructions. Staff Ex. 7, at 76. The evidence indicates that such training has already been provided and that plans are to provide retraining in this regard at least quarterly. Tr. 17945-46 (Lamison).
338. In summary, the evidence indicates that for each of the applicable training criterion in NUREG-0654, Section 0.4, appropriate training for State and local emergency response personnel has already been provided, is ongoing, or is planned for the near future. Thus, we find that Contention EP-5(F) has essentially been satisfied.
339. Contention EP-5H states that:

The Commonwealth plan for hiring and training a nuclear engineer to be dispatched to the TMI-1 control room upon the occurrence of any future nuclear accident should be completed before restarting is authorized.

The evidence indicates that the Commonwealth has in its employ a nuclear engineer who will be dispatched to the Licensee's EOF in the early stages of a radiological emergency at TMI. Chesnut and Bath, ff. Tr. 19626, at 18. Thus, we find that Contention EP-5(H) has been satisfied.^{93/}

2. Exercises and Drills

340. Contention EP-4(F) asserts that:

The provisions for the conducting of a "Radiation Emergency Exercise" of the Licensee EP, at 8-8) and of the Commonwealth (Pa. DOP, App. 14) are inadequate in that they do not clearly provide for the participation therein of federal agencies. The necessity for such participation is clearly established by the extensive involvement of federal agencies in the TMI accident. Second, the aforementioned appendix to the Commonwealth's emergency plan indicates that "all major elements of the plans and preparedness organizations" may be tested only over a period of five years. All such elements should be tested in an exercise prior to the restart of TMI-1.

Contrary to the assertions in this contention, both the Commonwealth's Emergency Plan and the Licensee's Plan anticipate federal participation in the full-scale radiation emergency exercises. Thus, the Commonwealth's Plan specifies that "[p]rovisions will be made to include Federal emergency response in this annual exercise." Commonwealth Ex. 2A,

^{93/} There is no requirement or guidance stipulating that a State and/or local emergency response organization is to station a nuclear engineer or other technical analyst in the control room during an emergency. State technical analysis representatives at the Licensee's EOF are preferred under the regulatory guidance. Staff Ex. 7, at 41, Criterion C.2(a); Chesnut and Bath, ff. Tr. 19626, at 17-18. Thus, we find no inadequacies in the Commonwealth's plan to station its technical analysis representative in the Licensee's EOF rather than in the control room as referenced in Contention EP-5(H).

Appendix 14, at 14-1. Similarly, the Licensee's Emergency Plan provides that "[d]rill scenarios will be prepared that involve participation of several emergency teams and all or specific parts of the onsite and offsite emergency organizations including varying degrees of participation of State, county and federal agencies and organizations and local services support personnel and organizations." Licensee Ex. 30, at 8-7.

341. 10 C.F.R. Part 50, Appendix E, § IV.F.2 requires that plans be made for federal emergency response agency participation in a full scale emergency response exercise at least once every five years for each site at which there is one or more licensed power reactors. Federal agency participation in exercises for a particular site once every five years is adequate in view of the fact that federal agency participation in exercises in general is much more frequent because of the number of licensed plants conducting exercises. Tr. 14275-76 (Giangi). In accordance with the provisions of 10 C.F.R. Part 50, Appendix E, it is expected that federal agencies will participate in the full scale exercise for TMI at least once every five years.^{94/} Rogan et al. ff. Tr. 13756, at 117. We

^{94/} In this vein, the NRC's regional response team was activated and participated in the June 2, 1981 full scale exercise for TMI. Donaldson and Chesnut, ff. Tr. 22236, at 5. The NRC response functions exercised at the time were radiological assessment, operational assessment and communications functions and the functions of the NRC's Director of Site Operations. Tr. 22321 (Donaldson).

find this to be acceptable and in consonance with the provisions of 10 C.F.R. Part 50, Appendix E.

342. On June 2, 1981, a full scale emergency response exercise was conducted for TMI. This exercise, undertaken in response to the Commission's order in CLI-79-8 that the Licensee conduct a test exercise of its emergency plan (CLI-79-8, 10 NRC 141, 144, short term Order item 3(e)), involved direct participation by the Licensee's onsite and offsite emergency response organizations, fire companies supporting the Licensee's onsite emergency response (Donaldson and Chesnut, ff. Tr. 22236, at 3-5), various State agencies with emergency responsibilities, Dauphin, Cumberland, Lancaster and Lebanon Counties, and one municipality in each of Dauphin, Lancaster and Cumberland Counties. Staff Ex. 20, at 3-6, 13; Staff Ex. 18, at 1. The exercise involved a comprehensive and detailed emergency scenario with the simulated accident escalating from the Unusual Event to the General Emergency classification. Donaldson and Chesnut, ff. Tr. 22236, at 4. The functional areas of the Licensee's Plan and emergency response organization tested in the exercise were: (1) operations staff actions in detection, classification and operational assessment of the accident; (2) notification of offsite agencies, notification and call-up of Licensee personnel and communications; (3) radiological dose assessment and projection and protective action decision-

making; (4) Licensee personnel assembly and accountability; (5) security; (6) in-plant, onsite and offsite radiological surveys; (7) first aid and rescue; (8) interface with the NRC response organization; (9) in-plant radiation protection; (10) technical support; (11) public information; (12) repair/corrective actions; and (13) direction and coordination of the response. Id. at 4-5.

343. The functional areas of the State, county and municipal planning and emergency response organizations tested were:
- (1) notification, alerting and emergency response organization mobilization for the State, counties and municipalities (Staff Ex. 20, at 3-6);
 - (2) direction and control for the State, counties and municipalities (Id. at 8-13);
 - (3) accident assessment, radiological monitoring, and protective action decisionmaking for the State (Id. at 16, 17, 18);
 - (4) radiological exposure control for the State, counties and municipalities (Id. at 21-24);
 - (5) protective actions, mass care provisions, evacuation support and medical and public health support for the State, counties and municipalities (Id. at 26-30);
 - (6) communications for the State, counties and municipalities (Id. at 32-33); and
 - (7) public information for the State and counties (Id. at 35). None of these functions (except for the Licensee's initial notification of the declaration of a General Emergency (Tr. 22801-802 (Hardy))) were tested for York County, which did not participate in the exercise. Staff Ex. 20, at 1.

344. From the standpoint of Licensee's response in the exercise, the evidence indicates that the Licensee demonstrated its ability to carry out its own approved emergency procedures, to coordinate its response with that of offsite agencies, and to respond to the emergency simulated by the exercise scenario. No shortcomings or deficiencies which degraded the sufficiency or effectiveness of the Licensee's emergency response in any of the functional areas were observed. Donaldson and Chesnut, ff. Tr. 22236, at 5. Deficiencies that were observed were minor and insignificant and did not degrade the Licensee's response. These deficiencies have, however, been noted by the Licensee for correction and correction or resolution of the deficiencies will be scrutinized and verified by the NRC's Office of Inspection and Enforcement. Id. at 6.
345. From the standpoint of State, county and municipal responses in the exercise, a team of 38 federal observers from FEMA, EPA, the Department of Energy, NRC, FDA, the Public Health Service, the U.S. Department of Agriculture and the U.S. Department of Transportation noted a number of response deficiencies resulting in 72 recommendations for planning improvements. Some of those recommendations were consolidated into 7 planning areas which should be given priority for improvement. However, the federal observer team found that the overall response capability for Pennsylvania (with the

exception, of course, of York County) was shown to meet minimum emergency response standards notwithstanding the improvements that were recommended. Staff Ex. 20, at 1-2; Tr. 22747 (Adler). The Commonwealth has made a commitment to address each of the 72 recommendations which pertain to State emergency planning and response and to provide assistance to the counties in addressing those recommendations pertaining to the counties and municipalities. Tr. 22834-35 (Straube).

346. From the evidence outlined, we find that the June 2, 1981 exercise constituted a full scale emergency exercise which adequately tested the major elements of plans and preparedness for the Licensee, the State, four of the five counties within the plume EPZ for TMI and representative municipalities in the plume EPZ. In addition, we find that, with the exception of the lack of participation of York County, the June 2, 1981 exercise satisfied the Commission's short term Order item 3(e) directing the conduct of a test exercise prior to restart. Because of the importance of York County in emergency preparedness for the TMI area and of the fact that FEMA is unable to provide findings and determinations on the overall adequacy of York County's emergency response capability without a demonstration of that capability in an exercise (Staff Ex. 18, at 2), we find that York County should demonstrate the capability to implement its emergency plan through

participation in at least a limited exercise as a condition for restart of TMI-1.^{95/} With that condition, we find that the Commission's short term Order item 3(e) will be satisfied as will the assertion in Contention EP-4(F) that major elements of the plans and preparedness organizations should be exercised before restart of TMI-1.

347. With regard to the York County Emergency Plan, Contention EP-14(C) asserts, in part, that:

Moreover, Section VI, Subsection (c)(4) provides that there will be an exercise and training of emergency service forces to include at least one annual exercise conducted in connection with PEMA. It is submitted that this part of the Plan is deficient because it does not require mandatory participation of all of the local emergency service forces. A most recent test conducted by PEMA in July of 1980 did not include the participation of a majority of the local townships and boroughs because the persons who would have been involved in that training exercise are volunteers and would not or could not obtain leave from their employers to participate in such a training exercise. It is contended that the Plan is still deficient in this area unless and until the Commonwealth of Pennsylvania through its police powers provides that those who are considered to be emergency service forces within the local boroughs and townships are given nonprejudicial paid leave time by their employers in order to participate in such an exercise.

At the outset, we note that the revised York County Emergency Plan does, in fact, provide for the participation of

^{95/} York County has proposed to participate in a radiological emergency exercise which would be conducted on August 29, 1981, a date which is acceptable to FEMA, PEMA and the Licensee. The exercise would not be on the scale of the June 2, 1981 exercise but will be sufficient in scope to fully exercise York County emergency response functions and will involve some municipalities within York County. Tr. 22874-76 (Hibbert).

municipalities and local emergency service forces in planned exercises and drills. Under the York County Plan, the County will ensure that those municipalities within the TMI plume EPZ participate in the State sponsored full scale exercises.

Board Ex. 5, at P-1. In addition, the County will ensure the participation of risk municipalities within its jurisdiction in required smaller scale drills for TMI and in the testing of communications links through monthly communications drills.

Id. at P-2. The County will also coordinate the participation of local support service organizations, such as ambulance services, in scheduled drills. Id. at P-3. Thus, the York County Plan sets forth commitments by the County to procure the participation of municipalities and local emergency support forces in emergency response exercises and drills.

348. This is not to say that participation of all York County municipalities and support organizations in all radiological emergency exercises and drills is, or should be made, mandatory. The NRC's emergency planning rules require annual participation in exercises of local emergency response organizations in the plume EPZ sufficient to demonstrate that necessary resources and procedures are adequate but this does not mean that each element of each emergency response organization must participate. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 52. What is called for is a testing of representative elements of emergency response, not an exercise

of every element for every emergency response organization.

Tr. 19084-85 (Adler).

349. The evidence indicates that the Commonwealth has, on occasion, experienced difficulties in getting municipal participation in exercises because of difficulties in volunteer emergency workers' taking leave from their full-time employment. Tr. 17957 (Lamison). This problem might be overcome, for example, by scheduling exercises on weekends when most volunteer emergency workers would not be working at their regular employment. FEMA's experience with emergency response exercises at other nuclear facilities is that sufficient emergency response personnel participate in such exercises to provide an adequate test of emergency capabilities despite the fact that some personnel have to take leave from their normal employment. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 53-54.
350. Moreover, there is no federal regulatory requirement that non-prejudicial leave or pay be provided to emergency workers so that they may participate in radiological emergency exercises. Adler and Bath (2/23 Testimony), ff. Tr. 18975, at 53. We question our authority to require, as a condition of restart, that the Commonwealth mandate non-prejudicial paid leave time from employers of volunteer emergency workers as advocated in Contention EP-14(C). In any event, we believe that, on balance, York County's commitment in its revised Emergency Plan to ensure the participation of municipalities

in emergency exercises provides assurance that adequate representative municipal participation will obtain for York County. Accordingly, we reject that portion of Contention EP-14(C) dealing with York County's planning for exercises and drills.

3. Audit and Review of Plans

351. As for provisions for the audit and review of the Licensee's Emergency Plan, Contention EP-17(B) asserts that:

Licensee's Emergency Plan fails to adequately provide a mechanism which will assure the effectiveness of the Emergency Plan throughout the operational lifetime of the TMI-1 facility.

Under the Licensee's Emergency Plan, the Licensee's Supervisor of Emergency Preparedness is assigned the responsibility for maintaining the effectiveness of the Emergency Plan throughout the operational life of the facility. In this regard, he is assigned the responsibility for ensuring the coordination of the Licensee's Plan with State and county plans, for coordinating the review and updating of the Plan and implementing procedures and for keeping the plan current with respect to changes in federal regulations and guidance. Chesnut, ff. Tr. 15007, at 81.

352. The Licensee's Quality Assurance Department is responsible for the annual audit of the Emergency Plan and implementing procedures to verify compliance with federal regulations and operating license provisions. Chesnut, ff. Tr. 15007, at 81. In addition, provision is made for the critique of exercises and

drills and for identifying, tracking and resolving planning deficiencies identified as a result of exercises and drills. Id.; Donaldson and Chesnut, ff. Tr. 22236, at 6.

353. Provisions have been made for reviewing and updating the Licensee's Emergency Plan at least annually. Staff Ex. 6, at 28. The Plan provides that the Licensee, the Commonwealth, the counties and federal agencies, all of which maintain controlled copies of the Plan, will receive revisions to the Plan as they are issued. Chesnut, ff. Tr. 15007, at 82. In addition, provision is made to assure that all members of Licensee, State, county and federal emergency response organizations are informed of the Licensee's Emergency Plan, implementing procedures, and revisions to each. In short, the Licensee has established responsibilities for plan development and review and for distribution of the Emergency Plan and procedures, and has mechanisms in place for maintaining plan effectiveness in accordance with the NRC's planning standard on the development, periodic review and distribution of emergency plans. Staff Ex. 6, at 28-29. Consequently, we find that, contrary to the assertions in Contention EP-17(B), Licensee's Emergency Plan adequately provides mechanisms which will assure the effectiveness of the Plan throughout the operational life of the TMI-1 facility. Thus, we find Contention EP-17(B) to be without merit.

I. Funding for Emergency Response

354. Contention EP-14(GG) asserts that:

The York County Plan does not contain any treasury or source of financing in the event that an emergency is declared and payment to be made. It is a general assumption, apparently on behalf of the Plan, that the county treasury can be invaded by the Commissioners for use during an emergency; however, it is Intervenor's position that a set emergency fund should be in place and stated within the Plan so that there would have to be no indecision as to the legality of withdrawing funds in the event of an emergency situation for ad hoc expenses.

We would initially note our concern that the matter of funding for emergency response, whether it be funding for the State, the counties or municipalities, appears to be a matter beyond the scope and the reach of the NRC's emergency planning regulations.^{96/} Those regulations are directed toward assuring that adequate emergency preparedness provisions are in place and maintained, regardless of the source of funds required to provide adequate emergency preparedness.^{97/} We question our authority to require the Commonwealth or the counties or even the Licensee to provide "a set emergency fund" as a source of financing in the event an emergency is declared.

^{96/} The source of funding for emergency response is clearly beyond the scope of considerations in NUREG-0654. Adler and Bath (3/16 Testimony), ff. Tr. 18975, at 65.

^{97/} In its Statements of Consideration accompanying the new emergency planning rules, the Commission expressed its view that the question as to whether the NRC should or could require a utility to contribute to the expenses incurred by State and local governments in upgrading and maintaining their emergency planning and preparedness is beyond the scope of the new emergency planning rules. 45 FED. REG. 55402, 55408 (August 19, 1980).

355. Nevertheless, if the question of funding for emergency response were such as to bring about indecision on whether to implement protective actions by emergency management personnel at the time of an emergency, the matter of funding could have an impact on emergency response warranting a consideration of means to avoid that impact. There is no evidence of record that this is the case, however. Rather, the evidence shows that each municipality and political subdivision in the Commonwealth may, by law, defray its expenses for emergency management activities. When the Governor declares an emergency, political subdivisions may reallocate funds to emergency response activities and dispense with competitive bidding. Tr. 1783e 37 (Lamison). Apart from this, there is a large reservoir of material resources in the Commonwealth which may be tapped to provide assistance to the counties at risk in meeting unmet resource needs. Tr. 17868 (Lamison). Thus, there are means through which political subdivisions may obtain funds and material resources necessary for emergency response. Because of this, we perceive no need to establish "set emergency funds" as a source of financing in the event of an emergency, even if we had the authority to require the establishment of such funds. We, therefore, find Contention EP-14(GG) to be without merit.

III. FINDINGS OF FACT ON COMPLIANCE WITH THE COMMISSION'S
SHORT AND LONG TERM ORDER ITEMS AND ON THE OVERALL
ADEQUACY OF EMERGENCY PREPAREDNESS FOR TMI-1

356. An examination of the emergency preparedness short and long term Order items of the Commission's August 9, 1979 Order and Notice of Hearing reveals that, apart from short term items 3(c) (upgrade offsite monitoring capability prior to restart) and 3(e) (conduct a test exercise prior to restart) and long term item 4(a) (modify emergency plans to address changing capabilities of plant instrumentation), the emergency preparedness short and long term Order items are encompassed within, or are less rigorous than, the requirements of the new emergency planning rules. Because of this, compliance with the new emergency planning rules will, of necessity, result in compliance with these emergency planning Order items.
357. As to the short term Order items not encompassed within the new emergency planning rules, we have previously found (in Section II.B.2(d) supra) that the Licensee has sufficiently upgraded its offsite monitoring capabilities, including its TLD capabilities, to meet the requirements of short term Order item 3(c). In addition, we have found (in Section II.H.2 supra) that a full scale test exercise involving the Licensee, the Commonwealth, four of the five counties in the plume EPZ and several municipalities has, in fact, been conducted. Thus, the requirement that the Licensee participate in an emergency exercise as directed by short term order item 3(e) has been met. Donaldson and Chesnut, ff. Tr. 22236, at 7. However, because York County did not

participate in that exercise and its participation is essential to a finding on the adequacy of York County's emergency preparedness, as will be discussed below, we have found that restart of TMI-1 should be conditioned on York County's demonstrating its capabilities through an exercise.

358. As to long term item 4(a), the evidence indicates that work has been underway for some time on the design and installation analyses for instrumentation for the detection of inadequate core cooling, high range effluent monitors, in-plant iodine instrumentation and post-accident sampling capability. The equipment and systems being considered will, once installed, provide additional instrumentation for assessing and monitoring actual or potential offsite consequences during an emergency. Staff Ex. 6, at 18. Licensee's Emergency Plan and procedures will be modified to reflect the use of this new instrumentation when such instrumentation is available and as plant instrumentation capability changes. The evidence indicates that the Licensee has demonstrated reasonable progress toward completion of long term Order item 4(a). Staff Ex. 1, at D4-1.
359. The Licensee's Emergency Plan has been reviewed and evaluated in considerable detail by the NRC Staff to determine the Licensee's compliance with the planning standards of 10 CFR §50.47(b). The results of the Staff's evaluation are set forth in its Emergency Preparedness Evaluation for TMI-1, NUREG-0746 (Staff Ex. 6) and the

May 29, 1981 supplement to NUREG-0746 (Staff Ex. 23). The evidence presented by the Staff in this regard establishes that the Licensee's emergency planning meets the planning standards of Section 50.47(b)(1) with regard to the assignment of responsibility for emergency response functions (Staff Ex. 6, at 3), Section 50.47(b)(3) with regard to emergency response support and resources (Staff Ex. 6, at 8), Section 50.47(b)(11) with regard to radiological exposure control (Staff Ex. 6, at 22), Section 50.47(b)(12) with regard to medical and public health support (Staff Ex. 6, at 23), Section 50.47(b)(13) with regard to recovery and reentry planning and post-accident support (Staff Ex. 6, at 24), and Section 50.47(b)(16) with regard to provisions for the development, periodic review and distribution of emergency plans (Staff Ex. 6, at 28-29).

360. The Staff's evaluation demonstrates that the Licensee's planning conforms to the planning standard of Section 50.47(b)(2) with regard to the onsite emergency organization and the standard of Section 50.47(b)(8) with regard to emergency facilities and equipment in all respects except for the staffing of the EOF.^{98/} Staff Ex. 6,

^{98/} As previously discussed, Licensee has, in fact, established an EOF for federal, state and local officials and key technical groups from the Licensee's offsite emergency organization. Staff Ex. 6, at 15. Licensee has also established an alternate EOF at the Crawford Station which is about three miles north of the TMI site. Id. Thus, Licensee satisfies short term Order item 3(b) requiring that an EOF and an alternate EOF be established.

at 7, 17; Staff Ex. 23, at II-13 to II-15, II-16. The planning inadequacies in this regard involve the Licensee's failure to provide for a functioning EOF with the Emergency Support Director present before about four hours after the declaration of a Site Area or General emergency. We have previously discussed this matter at length and have determined that the Licensee should be required to have its EOF manned by the Emergency Support Director and functioning within about one hour. Requiring this as a condition of restart brings the Licensee into conformance with the referenced planning standards.

361. As to the planning standard of Section 50.47(b)(4) with regard to the emergency classification system, the Staff had initially determined that all aspects of the standard were met in the Licensee's planning except for the need for modifications to certain emergency action levels used by the Licensee to declare an emergency. Staff Ex. 6, at 9-10. The Licensee subsequently revised its Emergency Plan, modifying its EALs to be consistent with NUREG-0654 criteria, thereby achieving full compliance with this planning standard. Staff Ex. 23, at II-11, 11-12; Tr. 22880 (Chesnut).
362. The Licensee's full compliance with the planning standard on notification methods and procedures set forth in 10 CFR §50.47(b)(5) was shown to be dependent only upon the formalization of contingency procedures for notification of the counties of the

declaration of an Unusual Event, an Alert or a Site Area Emergency and upon the completion of the Licensee's siren alerting system. Staff Ex. 6, at 12, 31. The contingency procedures for alerting the counties have now been incorporated into the Licensee's Emergency Plan so that that matter is resolved. Staff Ex. 23, at II-3. The matter of the Licensee's siren alerting system was previously addressed at length. We have determined that completion of that system should be a condition of restart. Completion of the siren system will bring the Licensee into full compliance with the referenced planning standard. It will also result in the Licensee's full compliance with the planning standard on emergency communications (Section 50.47(b)(6)) for which the only deficiency preventing full compliance is the lack of a completed and operable prompt alerting system. Staff Ex. 6, at 12.

363. With the development by the Licensee of its detailed public information program, the only matter preventing the Licensee's compliance with the planning standard on public education and information (10 CFR §50.47(b)(7)) is the lack of full distribution of the Commonwealth's and the counties' emergency information pamphlets to residents within the plume EPZ for TMI. Staff Ex. 6, at 30; Staff Ex. 23, at II-5. This noncompliance will be remedied by the Licensee's commitment to print and distribute the State and county pamphlets by September 1981. Tr. 22878-79 (Chesnut).

364. The Staff had initially determined that the Licensee's planning met the planning standard of 10 CFR §50.47(b)(9) with regard to accident assessment except for the need to provide expanded emergency action levels consistent with the criteria of NUREG-0654 and the need for more accurate assumptions on containment leak rate for use in dose projections. Staff Ex. 6, at 19, 30, 31. Modified emergency action levels consistent with NUREG-0654 criteria have, in fact, been incorporated into the Licensee's revised Emergency Plan. Staff Ex. 23, at II-11, II-12; Tr. 22880 (Chesnut). In addition, we have previously discussed the Licensee's modified containment leak rate assumptions and found that they will provide a reasonable estimate of actual containment leak rate for use in dose projection. Accordingly, we find that the only deficiencies preventing full compliance with the planning standard on accident assessment have now been corrected.

365. Licensee's full compliance with the planning standard on protective response (Section 50.47(b)(10)), was prevented only by the absence of an evacuation time estimate for use in protective action decisionmaking and by the need for a stockpile of radioprotective drugs for use by onsite personnel in the event of an emergency. Staff Ex. 6, at 21, 30. As previously indicated, the Licensee has provided acceptable evacuation time estimates developed in accordance with the criteria of NUREG-0654. Staff Ex. 23, at I-8. It has also been established that the Licensee maintains a supply of potassium iodide onsite and has an approved procedure for its

distribution and use by onsite emergency personnel in the event of radiological emergency at TMI. Staff Ex. 23, at II-9.

Accordingly, we find that the only deficiencies preventing full compliance with the planning standard on protective response have been corrected and that compliance in this regard has been achieved.

366. The evidence establishes that the Licensee's provisions for exercises and drills meet the planning standard for exercises set forth in 10 CFR §50.47(b)(14). A previously identified deficiency with regard to the planned frequency of certain communications tests has been corrected by the Licensee's revised emergency plan provisions for quarterly communications drills with State and federal emergency response organizations. Staff Ex. 5, at 26, 30; Staff Ex. 23, at II-10.
367. It has also been established that the Licensee's provisions for radiological emergency response training comply with the planning standard on training (Section 50.47(b)(15)). Staff concerns over the apparent lack of provision for periodic training for chemistry personnel have been resolved by the Licensee's revised emergency plan provisions for training such personnel. Staff Ex. 6, at 28, 31; Staff Ex. 23, at II-13.
368. In summary, the evidence demonstrates that with the imposition of requirements on manning of the EOF and the completion of the siren alerting system as conditions of restart, the Licensee's emergency planning meets all of the planning standards of 10 CFR §50.47(b). Staff. Ex. 23, at II-16, IV-1; Tr. 22380 (Chesnut). We conclude

that the Licensee has upgraded its emergency planning to meet the requirements of the new emergency planning rules and that the Licensee's Plan, together with the conditions we would impose, provide an adequate planning basis for an acceptable state of Licensee's emergency preparedness.^{99/}

369. The State and county emergency plans and offsite preparedness capabilities were reviewed and evaluated by FEMA. The initial review of the revised State and local plans was conducted by FEMA's Regional Assistance Committee (RAC). From that review, the RAC determined that State and local plans had been upgraded and significantly improved but that there remained certain deficiencies, the impact of which on preparedness would have to be determined from the joint exercise. Staff E. 18, at 1. Subsequent to the joint exercise, a reevaluation of the offsite emergency preparedness was performed. From the initial plan review and the exercise evaluation, FEMA made an overall determination as to the adequacy of offsite emergency preparedness. Tr. 22536 (Dickey). FEMA's overall determination of capability was presented in the form of interim findings and determinations issued pursuant to the NRC's request under the FEMA/NRC Memorandum of Understanding (MOU - Board Ex. 11). Tr. 22649 (Dickey).

^{99/} Accordingly, we find that Licensee's planning exceeds the requirements of short term order item 3(a).

370. From the overall evaluation and the findings and determinations presented by FEMA, the evidence shows that the capability of those government organizations which participated in the June 2, 1981 exercise exceeded minimum standards. Staff Ex. 18, at 1. While certain deficiencies in planning, which were the subject of a number of FEMA recommendations to the Commonwealth and the counties, remain and should be corrected, the overall effect of the exercise was to demonstrate the capability to carry out the functions which were the subject of the deficiencies. Staff Ex. 18, at 2.

371. The evidence shows that the emergency plans of the Commonwealth and the five counties (including York County, which did not participate in the June 2, 1981 exercise) are adequate and capable of being implemented. Tr. 22644-45 (Dickey). While not all of those plans fully comply with each of the applicable planning standards of 10 CFR §50.47(b),^{100/} the identified deficiencies are administrative and

^{100/} FEMA's evaluation of the State and five county plans shows that those plans essentially meet the requirements of Section 50.47(b)(3) on emergency response support and resources (Staff Ex. 23, at III-4); Section 50.47(b)(4) on the emergency classification system (Staff Ex. 23, at III-4); Section 50.47(b)(9) on accident assessment (Staff Ex. 23, at III-4, III-19); Section 50.47(b)(12) on medical and public health support (Staff Ex. 23, at III-5); and Section 50.47(b)(13) on reentry and recovery and post-accident operations (Staff Ex. 23, at III-5).

State planning essentially meets the requirements of Section 50.47(b)(1) on the assignment of responsibility (Staff Ex. 23, at III-4). While there are procedures and details that must be incorporated into county plans in this regard, the June 2, 1981 exercise demonstrated that the participating counties were cognizant of their responsibilities (Staff Ex. 23, at III-4; Staff Ex. 21, at 1).

FOOTNOTE CONTINUED ON NEXT PAGE

relatively minor in nature, are correctable, and are in the process of being corrected by the Commonwealth and the counties. Tr. 22537, 22663-64, 22666, 22691-92 (Dickey) In this regard, the Commonwealth

100/ (continued)

Offsite planning does not comply with the requirements of Section 50.47(b)(5) on notification methods and procedures in the absence of the Licensee's siren alerting system (Staff Ex. 23, at III-4). This should be rectified and compliance with this planning standard achieved through the completion of the Licensee's siren system, an action which we would require as a condition of restart.

As to compliance with the requirements of Section 50.47(b)(6) on emergency communications, the June 2, 1981 exercise demonstrated that communications systems and emergency worker alerting procedures are adequate for the State and the participating counties. Staff Ex. 21, at 1. However, procedures for Dauphin County's backup communications role for the State remain to be developed and direct communication links between the State's offsite monitoring teams and the Licensee's EOF should be established. Staff Ex. 23, at III-4; Staff Ex. 21, at 1-2.

The State and County emergency plan provisions for public education and information, once implemented, will exceed the requirements of Section 50.47(b)(7). Staff Ex. 23, at III-16. However provision remains to be made for the distribution of emergency information to transients and the State and county emergency information pamphlets must be distributed. Id. As we have previously noted, the Licensee has assumed responsibility for printing and distributing those pamphlets to residents in the plume EPZ by about September of 1981.

As to compliance with the requirements of Section 50.47(b)(8) on emergency facilities and equipment, the evidence shows that State and county emergency facilities are adequate. Staff Ex. 23, at III-4. A planning deficiency remains, however, in the need to predistribute thyroid blocking drugs and personnel dosimetry to the lowest emergency organization level. Staff Ex. 21, at 2.

For full compliance with the planning standard on protective response (Section 50.47(b)(10)), more detailed State planning on access control, which is currently underway (Bath (Attachment 3), ff. Tr. 22350, at 7) should be completed. For the counties, unfinished municipal plans should be completed. Staff Ex. 23, at III-5, III-21, III-22; Staff Ex. 21, at 2.

FOOTNOTE CONTINUED ON NEXT PAGE

has committed to address each of the identified deficiencies in State planning and to assist the counties in addressing each of the deficiencies pertaining to county and municipal planning. Tr. 22834-35 (Straube). In the same vein, FEMA will continue to provide assistance to the State and the counties in resolving the identified deficiencies (Tr. 22438 (Dickey)) and will assure that they are corrected or at least addressed. Tr. 22692 (Dickey).

100/ (Continued)

As to the requirements of Section 50.47(b)(11) on radiological exposure control, the deficiency previously identified regarding State distribution of personnel dosimetry should be resolved. On the county level, plans should be modified to provide for emergency worker decontamination at locations closer to their work stations. Staff Ex. 23, at III-5; Staff Ex. 21, at 2.

The requirements of Section 50.47(b)(14) with regard to exercises and drills are met by State planning. Staff Ex. 23, at III-21. County plans comply with the requirements also except for the need for development of radiological monitoring drills and improvement in communications drills. Staff Ex. 23, at III-27, III-5.

To fully comply with the requirements of Section 50.47(b)(15) on radiological emergency response training, the Commonwealth should provide for annual retraining as well as radiation monitoring training and improved dosimetry training. Staff Ex. 23, at III-5, III-28.

The requirements of Section 50.47(b)(16) on the development, periodic review and distribution of emergency plans are met by the State except for a need to update duty officer and EOC procedures. County plans should identify and list supporting procedures in greater detail than that which is currently provided. Staff Ex. 23, at III-5, III-29.

372. From its plan review and observations of the June 2, 1981 exercise, FEMA has found and determined that the radiological emergency response plans and the emergency preparedness capabilities of the Commonwealth and Cumberland, Dauphin, Lancaster and Lebanon Counties are adequate. Staff Ex. 18, at 2. In the event of a radiological emergency at TMI, the planned and demonstrated emergency preparedness capabilities of the State and these four counties would be adequate to protect the health and safety of the public. Tr. 22538-39, 22546, 22663 (Dickey).
373. Although FEMA's conclusion that offsite emergency plans are adequate and capable of being implemented apply to the York County Emergency Plan as well as to the plans of the Commonwealth and the other four counties in the TMI plume EPZ (Tr. 22541, 22653, 22676 (Dickey)), FEMA's findings and determination that there is demonstrated adequate State and local emergency preparedness capability do not apply to York County. Staff Ex. 18, at 2. The reason for this is that, by its failure to participate in the June 2, 1981 exercise, York County failed to demonstrate its capabilities. Staff Ex. 18, at 2; Tr. 22539, 22541, 22654 (Dickey). A demonstration of capability is necessary before FEMA can make findings and determinations on the overall adequacy of York County's emergency preparedness. Tr. 22676 (Dickey). In view of the importance of York County to an adequate level of emergency preparedness in the TMI area, we find that it is necessary that York County demonstrate its emergency preparedness capability prior to restart. Accordingly

such a demonstration by York County should be a condition of restart.^{101/}

374. Based on the FEMA findings and determinations and the entire record on emergency preparedness, we find that, with the exception of York County's planning, as to which a demonstration of adequacy through participation in an exercise will be required, offsite emergency preparedness for TMI provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at TMI-1. We find that the State and local emergency response plans, while exhibiting some limited deficiencies, are adequate and capable of being implemented.

375. We find that the evidence (Chesnut ff. Tr. 22881) further establishes that Licensee's emergency planning, in combination with the planning of the Commonwealth and the counties in the TMI plume EPZ and subject to compliance with the emergency preparedness conditions we would impose for restart, is adequate and provides reasonable assurance that appropriate protective measures can and will be taken in the event of a radiological emergency at TMI-1.^{102/}

^{101/} A mechanism for such a demonstration is an emergency exercise involving the Licensee, the State and York County. Such an exercise is currently scheduled for August 29, 1981. FEMA is prepared to provide its findings and determinations on York County's emergency preparedness capabilities within two weeks of that exercise. Tr. 22542 (Dickey).

^{102/} With this finding, we also find that the Licensee, State and local planning provide the capability to take appropriate protective actions for the population within the plume EPZ and that short term Order item 3(d) and long term Order item 4(b) are, therefore, met.

IV. CONCLUSIONS OF LAW

We have thoroughly reviewed all of the admitted evidence submitted by all of the parties relating to the issue of emergency preparedness for TMI-1. We have also considered all of the proposed findings of fact and conclusions of law submitted by the parties. Those proposed findings on emergency preparedness not adopted in this recommended decision are hereby rejected.

Based on our evaluation of the entire record and on the findings of fact set forth above, we conclude that:

1. Certain of the contentions raised by the Intervenors in this proceeding have been satisfied or will be satisfied by the imposition of those requirements set forth in paragraph 6 below as conditions of restart of TMI-1. We also conclude that none of the remaining contentions have been shown to be meritorious. Because those contentions have been found to be without basis in the record, we reject them in their entirety.
2. Our concerns enunciated in Board Question 4 have been resolved.
3. The Licensee has or, with the implementation of the conditions set forth in paragraph 6 below, will have

improved its emergency preparedness in accordance with the Commission's short-term Order item 3. Specifically, the Licensee has or will have:

- (a) Upgraded its emergency plan to satisfy current emergency planning criteria with special attention to action level criteria based on plant parameters;
 - (b) established an emergency operations center for federal, State and local officials, designated an alternate location and provided communications to the plant;
 - (c) upgraded offsite monitoring capability, including thermo-luminescent dosimeters or equivalent;
 - (d) assessed the relationship of State and local plans to the Licensee plans so as to assure the capability to take emergency actions; and
 - (e) conducted a test exercise of its emergency plan.
4. The Licensee has or, with the implementatin of the conditions set forth in paragraph 6 below, will have:

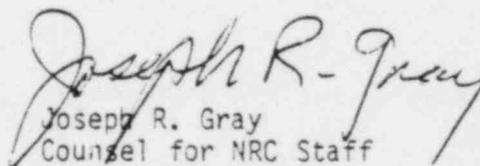
- (a) shown reasonable progress toward completion of long term order item 4(a) requiring modification of emergency plans to address changing capabilities of plant instrumentation; and
 - (b) extended the capability to take appropriate emergency actions for the population around the site to a distance of ten miles in accordance with long term order item 4(b).
- 5. With the implementation of the conditions set forth in paragraph 6 below, Licensee, State and local emergency plans are adequate and capable of being implemented and the state of onsite and offsite emergency preparedness provides reasonable assurance that appropriate protective measures can and will be taken in the event of a radiological emergency at TMI-1 in accordance with 10 CFR §50.54(s).
- 6. Certain of the conclusions of paragraphs 1, 3, 4 and 5 above are dependent in part upon the implementation of the following conditions of TMI-1 restart which will be imposed: Prior to restart of TMI-1:

- (a) The Licensee shall modify the TMI-1 Emergency Plan so as to provide that the Licensee's Emergency Operations Facility will be staffed and functional with its Emergency Support Director within about one hour of the declaration of an emergency of a classification of Site Area Emergency or higher.

- (b) The Licensee shall complete installation of, and render operable, its prompt alerting siren system for the TMI plume exposure pathway Emergency Planning Zone.

- (c) The ability of York County to implement its Emergency Plan must be demonstrated by participation of the County in a radiological emergency exercise sufficient to show adequate county emergency preparedness capability.

Respectfully submitted,


Joseph R. Gray
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 12th day of August, 1981