October 26, 1981

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	
	)	
SOUTH CAROLINA ELECTRIC & GAS COMPANY, et al.	)	Docket No. 50-395-OL
	)	
(Virgil C. Summer Nuclear Station, Unit 1)	)	

APPLICANTS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW IN THE FORM OF A SUPPLEMENTAL PARTIAL INITIAL DECISION

In accordance with 10 C.F.R. §2.754, Applicants, South Carolina Electric & Gas Company and South Carolina Public Service Authority, hereby submit Proposed Findings of Fact and Conclusions of Law in the form of a Supplemental Partial Initial Decision on Contention A8.

Respectfully submitted,

Joseph B. Knotts, Jr.
DEBEVOISE & LIBERMAN
1200 Seventeenth Street, N.W.
Washington, D.C. 20036

Attorney for South Carolina Electric & Gas Company and South Carolina Public Service Authority

D503
S
1/1

Randolph R. Mahan, Esq.
General Attorney
South Carolina Electric & Gas Company
P.O. Box 764
Columbia, South Carolina 29202

Date: October 26, 1981

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
SOUTH CAROLINA ELECTRIC & GAS COMPANY, et al.	)	Docket No. 50-395-OL
	)	
(Virgil C. Summer Nuclear Station, Unit 1)	)	

[Applicants' Proposed Findings Of Fact And Conclusions Of Law On Intervenor's Contention A8 Regarding Emergency Planning In The Form Of a]
SUPPLEMENTAL PARTIAL INITIAL DECISION

1. This supplemental partial initial decision resolves those issues in a controversy arising under Intervenor Bursey's Contention A8. That contention was as follows:

> "The Applicant has made inadequate preparations for the implementation of his emergency plan in those areas where the assistance and cooperation of state and local agencies are required."

The Legal Standard

2. Nuclear facility licensees and applicants for operating licenses are required by NRC regulations to develop emergency response plans (10 C.F.R. Part 50, §50.47 and Appendix E). Section 50.47 of Part 50 states specifically as follows:

> (a)(1) No operating license for a nuclear power reactor will be issued unless a finding is made by NRC that the state of on-site and off-site emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

3. Portions of the NRC regulations require Licensees and Applicants to coordinate their plans with state and local agencies over whom NRC does not have jurisdiction. In recognition of this, Section 50.47(a)(2) provides that NRC will base its findings as to the adequacy of off-site emergency plans on review of the Federal Emergency Management Agency (FEMA) determinations as to whether state and local emergency plans are adequate and capable of being implemented, and that NRC itself will assess the adequacy and capability of implementation of the Applicants' on-site emergency plans. Evaluation of off-site emergency preparedness is the function of FEMA in the first instance. A FEMA finding constitutes a rebuttable presumption on the question of adequacy. (10 C.F.R. §50.47(a)(2)).

4. Section 50.47(b) lists sixteen standards which on-site and off-site emergency response plans for nuclear power reactors must meet. As indicated in a footnote to Section 50.47(b), the standards are complemented by specific criteria in NUREG-0654 (FEMA REP-1), which appeared in its final form as Rev. 1 in October, 1980. The key issues to be determined by this Board as they relate to the listed standards are embodied in the terms "adequate and capable of being implemented." As is clear from the Intervenor's contention on this issue, he was concerned primarily with the ability of the Applicants to implement their emergency plans, specifically where that implementation requires

interface between the Applicants and state and local emergency response agencies.

5. Testimony on the emergency planning issues was heard on four days during a June-July hearing session as well as three days (September 22-24, 1981) specifically set aside for the hearing of the remainder of the emergency planning testimony. The parties presented thirty-nine witnesses, a majority of whom were subpoenaed by the Board at the request of the Intervenor during the June-July hearing sessions. Fourteen exhibits relating to emergency planning were admitted into evidence.

6. Our principal concern, and that of the Staff and FEMA, in assessing Applicants' arrangements with state and local agencies, is the relationship between the Applicants and agencies most directly and substantially involved in the emergency response scheme for portions of four counties in the 10 mile plume exposure pathway emergency planning zone ("EPZ"), all in the State of South Carolina. The four counties having population within the ten mile emergency planning zone are: Richland, Lexington, Newberry and Fairfield. The principal state agencies involved are (1) the Emergency Preparedness Division of the Office of the South Carolina Adjutant General, and (2) the South Carolina Department of Health and Environmental Control.

7. The following representatives of the State and Local Governmental bodies were called: Thomas E. Longshore, Jr. (Newberry County), Colonel James DeLoache and Colonel Hugh K. Boyd (Richland County), James R. Andonaegui (Lexington County), George Douglass (Fairfield County), T. Eston Marchant, Joseph F. Hipp, Jr., General George R. Wise, Paul Lunsford, Pamela Neal, and Tom Beckham (South Carolina Adjutant General's Office, Division of Emergency Preparedness), Dr. Robert Jackson and Heyward Shealy (South Carolina Department of Health and Environmental Control). The Intervenor also called several of SCE&G's employees regarding the company's information brochure, who will be identified in the course of our discussion of that matter. The NRC Staff sponsored as its witnesses on emergency planning, Jack D. Richardson (FEMA) and Thomas A. Kevern (NRC Staff), and at the reconvened hearings on September 22, Brian K. Grimes, (NRC Staff). The Applicants presented Kenneth E. Beale, Dr. Robert J. Budnitz, Dr. William R. Stratton, and Lewis Storz.

The Emergency Plans

8. Before discussing the testimony, it will provide necessary background to review the documents of primary importance to the emergency planning issue. These documents are of course the emergency plans themselves - that of the Applicants, those of the counties directly concerned, and those of the State.

9. The Applicants' emergency plan, entitled Virgil C. Summer Nuclear Station, Radiation Emergency Plan was admitted as Applicants' Exhibit 30(a) (Tr. 3115). To that plan was attached an evacuation time assessment study, admitted as Applicants' Exhibit 30(b) (Tr. 3122).

10. The State of South Carolina's disaster preparedness plan which encompasses planning for a wide variety of natural and man made disasters has two components relevant to the Summer site. They are the State of South Carolina Operational Radiological Emergency Response Plan (SCOREP) for the Summer site and the State of South Carolina Technical Radiological Emergency Response Plan, admitted as Applicants' Exhibits 15(a) and 15(b) respectively. (Tr. 3116).

11. The Newberry, Richland, Lexington, and Fairfield County plans were admitted as Applicants' Exhibits 11, 12, 13 and 14, respectively. (Tr. 3118).

12. We will first discuss Part 3, V.C. Summer Fixed Nuclear Facility Site Specific Radiological Emergency Response Plan to SCOREP (Applicants' Exhibit 15(a)). As stated on page 3-1 of that document, it provides for guidance, coordination and utilization of state and other resources in support of local governments in the event of a nuclear accident at the V.C. Summer Nuclear Station. Possibly the most significant section of Applicants' Exhibit 15(a) in terms of the contentions in this case is Section IV

dealing with plan execution, since the contention relates more to execution than to content.

13. Section IV contains a statement on the concept of operations and includes a detailed discussion of the classifications of emergencies in order from the least to the most serious (Unusual Event, Alert, Site Emergency, and General Emergency). Classification of events is primarily the responsibility of the utility. (Applicants' Exhibit 15(a) pages 3-3 and 3-4). For example, under IV(A) (II)(d), we are advised that in a General Emergency, local governments and the Bureau of Radiological Health (BRH) of the South Carolina Department of Health and Environmental Control are immediately notified by SCE&G. SCE&G recommends protective actions to be instituted immediately. The counties react and provide for the protective actions, including evacuation and/or sheltering of the populace. The state and local responses are activated and their emergency operation centers are made operational. Upon establishment of state operational capability, the Forward Emergency Operations Center (FEOC) will assume coordination and resource responsibility for off-site operations. (Applicants' Exhibit 15(a), page 3-4).

14. This sort of detailed procedure for execution continues throughout the State planning document. For instance, we further see that if evacuation or other protective measures are required, they will be implemented in the affected sectors of the emergency planning zone on order

from the FEOC only, except in the event of an immediate General Emergency. In that event, the local governments will carry out any protective measures recommended by the Applicants' personnel without waiting for the FEOC to be operational. (Applicants' Exhibit 15 (a) (IV) (A) (v), page 3-4.) The Plan directs specifically what the state highway patrol's response will be in cordoning off the facility and restricting access; we are told who is responsible for the monitoring within the 10-mile EPZ as well as the 50-mile EPZ as well as how decontamination will be accomplished. There is also a procedure for the utilization of federal radiological emergency response resources for off-site radiological emergency response. (Applicants' Exhibit 15(a)(IV)(A)(viii), page 3-5.)

15. The State Plan lists in detail what the responsibilities of state government will be in the execution of the plan, i.e., what the offices of the Governor, the Adjutant General, the Emergency Preparedness Division, the Department of Health and Environmental Control, the State Law Enforcement Division, the Department of Wildlife and Marine Resources, the Department of Social Services, and other state agencies are responsible to provide or to accomplish. (Applicants' Exhibit 15(a) pages 3-5 through 3-7). For example, the Office of the Adjutant General is responsible for providing a representative at the FEOC as well as the State Emergency

Operations Center, to provide public information support to the office of the Governor, to be prepared to provide resources as requested by appropriate authority as well as be prepared to assist in decontamination procedures. They also are required to provide a Forward Emergency Operations site and support at the Winnsboro Army National Guard Armory. (Applicants' Exhibit 15(a), page 3-6).

16. Also contained within the State Plan are specific procedures for the execution of responsibilities by county and municipal governments. Fairfield, Newberry, Lexington and Richland counties are listed, along with their responsibilities. Generally referenced are counties located in the 50-mile EPZ along with a listing of their responsibilities. (Applicants' Exhibit 15(a), pages 3-7 and 3-8). Coordinating instructions are given to delineate specific responsibilities for protective responses, accident assessment, training, medical and health support, exercises and drills, planning, reception stations and evacuation procedures, administration of potassium iodide, provision for dosimeter/film badges for county radiological emergency response personnel as well as provision for dosimeters and film badges at the FEOC. (Applicants' Exhibit 15(a), pages 3-8 and 3-9). There is also a section on direction and control, providing instruction as to the control of off-site operations at different points and providing information

concerning control and communications. (Applicants' Exhibit 15(a), pages 3-9 and 3-10). There are maps and organizational charts showing lines of authority.

17. Annex D to Applicants Exhibit 15(a) is a reception centers and evacuation procedures section. It provides for the procedures to be followed for establishment and operation of reception centers and for evacuation in the event it is required. As in the main body of the document, it contains a concept of operations and provides for the specific responsibilities of the various offices of state government and of local government units involved. It contains coordinating instructions and a section on administration and logistics as well as one on command and control. There are several appendices to Annex D which provide more specific instruction and listing of responsibilities regarding reception center procedures (Appendi. 1) and evacuation of V.C. Summer employees (Appendix 2).

18. Annex F provides for a specific alert notification system and procedures (Applicants' Exhibit 15(a)). Again, as in the main document, Annex F contains a general section having a statement of purpose, reference to maps and charts, statement of the planning basis, a section on mission and a section on execution which contains a statement of the concept of operations and a statement of responsibilities for state and local government agencies and coordinating

instructions. There are seven appendices to Annex F: Appendix 1, population distribution map of the V.C. Summer 10-mile EPZ; Appendix 2, population distribution surrounding the V.C. Summer site (5-50 miles); Appendix 3, two-mile road block plan; Appendix 4, actions required for emergency classification; Appendix 5, format for notification of emergency conditions at the V.C. Summer Nuclear Station; Appendix 6, notification status form; Appendix 7, emergency broadcast system and educational T.V. organization and operation procedures.

19. On the whole, the document appears to present an adequate formulation of an emergency response system with implementing procedures. This is a conclusion which, as will be discussed later, is born out by evaluations by the Federal Emergency Management Agency and the Nuclear Regulatory Commission staffs.

20. The State of South Carolina Technical Radiological Emergency Response Plan (the Technical Plan) (Applicants' Exhibit 15(b)) provides for the guidance, coordination and utilization of the technical radiological emergency response and assistance to the State and/or affected local governments during an emergency resulting from a radiological incident at a Fixed Nuclear Facility. The Bureau of Radiological Health of the South Carolina Department of Health and Environmental Control is charged with the responsibility

for development, maintenance and coordination of technical radiological response efforts in support of the SCOREP objectives and concepts.

21. The Technical Plan specifies that the Bureau of Radiological Health has direct responsibility to provide technical assistance and resources necessary to evaluate and assess the consequences of a radiological incident, to provide protective action guidance to state and local authorities and to oversee decontamination and re-entry operations.

22. The Technical Plan describes in detail the supporting organizations which will be asked to render assistance when necessary. It contains a specific, detailed implementation plan, emergency response procedures, and a section on emergency data including names and telephone numbers of emergency and support personnel as well as a listing of special equipment and supplies available. It has appendices covering protective action guides, environmental monitoring and sampling and laboratory analysis capability, an environmental and health effects assessment plan, a listing of emergency decontamination procedures, recovery and re-entry procedures, an emergency radiological assistance team handbook, a statement on training, letters of agreement and memoranda of understanding with owners and operators of fixed nuclear facilities (including South Carolina Electric & Gas Company) and support organizations, and maps.

23. In regard to the county emergency operations plans, all four appear to be well coordinated as they have essentially the same format and contain the same types of information in nearly the same amount of detail. Each of the counties, Newberry, Richland, Lexington and Fairfield, already had emergency operations plans reflecting their planning efforts for coping with a wide variety of natural and possible man-made catastrophes, as evidenced by the fact that the fixed nuclear facility radiological emergency plans for each of the counties represent an annex to the main plan. For Newberry, Lexington and Fairfield counties, each is designated Annex Q. For Richland county, it is designated Annex E-1 (Applicants' Exhibits 11 through 14, respectively). We will take the Fairfield county plan as an example, since Fairfield county is the county within which the Summer facility is located and within which a large part of the 10-mile EPZ is contained.

24. The Fairfield county plan is set up in the same format as the state plan. The first section is a general section wherein is discussed the purpose of the plan and the authority for drafting and implementation of the plan at a state and county level. There is a list of references to the South Carolina Comprehensive Disaster Preparedness Plan, the South Carolina Operational Radiological Emergency Response Plan, the South Carolina Technical Radiological Emergency Response

Plan, the Facility Plan, and NUREG -0654. There is a listing of twelve maps showing things such as the two-mile, five-mile and ten-mile sectors, traffic control points and evacuation routes, the sector population estimates and the Fairfield County agriculturally oriented aspects of the plan. There is a definitional section for such things as "fixed nuclear facility," sometimes abbreviated in the plans as "FNF." There is a discussion of organizations involved, both in the governmental and private sectors. The Fairfield Plan contains a situational discussion, i.e., a discussion of factors which provide the context within which the Emergency Operations Plan (EOP) must operate, listing the situation on the national, state and local scene, and referencing the Summer facility, supporting organizations, assumptions concerning triggering events, and planning bases (Applicants' Exhibit 14, pages Q-1 through Q-11). There is a simple statement of mission, which is in general the same for each of the four counties: "Fairfield County will provide for the protection of the county populace and their property from the effects of ionizing radiation from a radiological accident at the V.C. Summer Nuclear Station F.N.F. through an organized and coordinated Radiological Emergency Response." (Applicants' Exhibit 14, III page Q-11.)

25. As in the state plan, The Fairfield Plan has an extensive section on execution which contains a statement

of the concept of operations, an explanation of the direction and control for Fairfield County and the implementation of the plan, a discussion of the warning systems, and a notification communications section which explains notification of Unusual Events, Alerts, Site Emergencies, and General Emergencies. The Fairfield County Plan has a section on accident assessment, one on public information, one on public health and sanitation, one on social services, one on fire and rescue emergency medical services, law enforcement, transportation and protective response. The section on protective response (Applicants' Exhibit 14, IV, M, page Q-22) discusses the policy and procedure on radio-protective drugs for emergency workers, radio-protective drugs for local populace, protective sheltering, and evacuation (including population distribution maps and evacuation times as well as evacuation for non-ambulatory evacuees). The execution section also has a discussion of radiological exposure control, medical recovery and reentry of affected areas, equipment availability and distribution, exercises and drills, radiological emergency response training and coordinating instructions. (Applicants' Exhibit 14, pages Q-11 through Q-36).

26. The Fairfield plan contains a Fairfield County radiological emergency response organization chart. Applicants' Exhibit 14, Appendix 1, page 58), a radiological emergency

response organizations summary table which delineates agencies with primary, as against support, responsibilities. (Id., page 59.)

27. Appendix 3 to the Fairfield Plan is dedicated to describing the traffic evacuation routes from the 10-mile EPZ and listing traffic control points for the evacuation of the 10-mile EPZ. (Id., page 60.) Appendix 4 contains procedures for alerting county warning teams and residents in the 10-mile EPZ (warning teams are utilized in the event of unavailability of the siren system). (Tr. 4445). Specific messages to be disseminated by the warning teams are listed. (Applicant's Exhibit 14, page Q-6 -b.) This is followed in Appendix 5 by a public information procedure describing in detail what happens in terms of public information upon confirmation of a notification of an accident at the V.C. Summer facility. (Id. page Q-62.) There is a two-mile evacuation and road block plan contained in the Fairfield plan. (Appendix 6, page Q-63.)

28. Appendix 7 contains a dose record form. There are further appendices which contain information or procedures relative to implementation of the Fairfield County radiological emergency response plan (Appendix 8), Fairfield County emergency response organization (Appendix 9), a discussion of NUREG-0654 criteria (Appendix 10), a discussion of the V.C. Summer nuclear station and surrounding site (Appendix

11), listing of letters of agreement for implementation of the plan (Appendix 12), a description of radiological emergency kits available (Appendix 13), a discussion of exercises and drills for testing the plan (Appendix 14), a directory of persons in the 10-mile EPZ requiring special assistance in case of evacuation (Appendix 15), and others.

29. This survey of the matters addressed in the Fairfield County Emergency Operations Plan, which is representative of the emergency operations plans for the other three counties, demonstrates the comprehensiveness of the written plans. We note in passing, moreover that the witnesses who appeared from each of the counties and testified concerning their plans possessed a good knowledge of their respective plans and of the methods of implementation of the plans.

30. Similar to the State and the Counties' plans in the amount of detail and scope of coverage, the Applicants' emergency plan, Virgil C. Summer Nuclear Station Radiation Emergency Plan (Applicants' Exhibit 30(a)) is set up in a format following that of NUREG-0654. The Applicants' plan begins on page P-1 with a cross reference index wherein each NUREG-0654 reference section is identified with a corresponding V.C. Summer emergency plan reference section. Thus, the NUREG guidance and the Applicants' response to that guidance can be compared with relative ease.

31. Following an introduction section, which includes definitions, the Applicants' plan has a section on Scope and Applicability. This includes discussions on the following topics: general information and site description; population distribution; emergency planning zones; purposes and objectives, including regulatory requirements; purpose of emergency preparedness, and objectives of the emergency plan; a summary of the emergency plan interrelationships (including other Applicant plans, participating governmental agencies, and local services support); a summary of emergency planning logic; discussion of emergency classifications, including the emergency classification system; the spectrum of postulated accidents (including classification of postulated accidents and instrumentation capability for detection); organizational control of emergencies (including normal station organization and on-site emergency organization, the off-site emergency organization, local services support, coordination with state and local government agencies and public notification); emergency measures (including activation of emergency organization, assessment actions, corrective actions, and protective actions); emergency facilities and equipment (including Applicants' on-site emergency centers, Applicants' emergency operations facility, the county and state emergency centers, the news media area, the communications system -- which in turn includes normal communications systems and emergency communications systems as well as

alarms, assessment facilities (including radiation monitoring system, fire protection and detection devices); protective facilities and equipment (including first aid and medical facilities and damage control equipment); means for maintaining emergency preparedness (including organizational preparedness, training, drills, exercises, and emergency coordinator); educational information to the public; review and updating of the emergency plan implementing procedures; maintenance and inventory of emergency equipment and supplies; and finally, reentry and recovery, (including a recovery organization). (Applicants' Exhibit 30(a), passim.)

32. Applicants' plan is a workable resource document which makes good use of graphics. It includes figures showing the general site location, site arrangement, the one-to-ten-mile population distribution, the ten-to-fifty-mile population distribution, the ten-mile (plume exposure pathway) emergency planning zone, and the fifty-mile (ingestion pathway) emergency planning zone and the percent occurrence of wind direction. It also has figures illustrating or showing interrelationships with government agencies, the South Carolina Electric & Gas Company organization, the V.C. Summer Nuclear Station organization, the on-site emergency organization, the off-site emergency organization, the interface between on-site and off-site emergency organizations, the evacuation routes, the emergency facilities' general locations, the emergency facilities' communications,

the environmental sampling locations, and the recovery organization. (Applicants' Exhibit 30(a), passim.

33. The Applicants' plan also features useful summaries of important information which can be consulted in tabular form. Included are tables showing emergency classifications and degree of involvement by participating groups (page 13), a summary of emergency action levels (page 19), typical instruments for accident detection and classification of hypothesized accidents (page 32-E), staffing requirements for emergency conditions (page 52-A), forms of initial emergency messages (page 52-D), follow-up emergency messages (page 52-F), sample emergency instructions and information for the public (page 52-I), and recommended protective actions to avoid whole body and thyroid doses from exposure to a gaseous plume (page 61). It provides a summary of actions for the various emergency classes (page 61-A), radiation monitoring system description (page 81), typical instruments available for monitoring major systems (page 86), environmental sampling stations (page 88), and periodic training of emergency response personnel. (page 99).

34. Having surveyed the content of the various plans, there is no question in our mind that they are comprehensive and we find they satisfy regulatory requirements. The Applicants, the Counties and the State Agencies involved have evidently considered the wide range of problems, and the resources which would be needed to cope with them in a coordinated fashion, that would be presented by an incident which

can have effects across geographic and political boundaries. This state of planning stands in sharp contrast to pre-TMI emergency planning.

35. Having reviewed the contents of the various state, local and facility plans, we now will address the specific areas of inquiry by the Intervenor which by inference are those areas believed by him to represent or be susceptible to inadequate implementation. The Board will take up in a later and separate discussion, however, consideration of these issues as they may relate to the postulated accident scenario presented by Intervenor's witness Kaku.

36. The issues on which Intervenor concentrated his questioning and which the Board discusses separately are as follows: Public education, Applicants' emergency brochure, public notification in the event of evacuation, transportation in the event of evacuation, evacuation routes and times, decontamination, medical services, potassium iodide, livestock and food crop contamination, and coordination with and readiness of secondary agencies. These will be discussed in turn, followed by our discussion of matters pertaining to Dr. Kaku's postulated accident scenario.

Public Education

37. As conceived by the Intervenor, the issue of public education relates to his thesis that in order for the public to respond as desired and expected in the event of an emergency situation at the Summer Station, they must specifically

be informed as to the nature of the hazards which could be presented by a worst-case, catastrophic nuclear accident at the facility (Tr. 2138), what might happen to the public should they not respond in such an event (Tr. 2017), and what steps agriculture producers might need to take in terms of having protected grain supplies or sheltering available for their livestock. (Tr. 2163-67, 2019). In contrast, the applicable guidance in NUREG-0654 and the approach taken by Applicants has been to address the range of emergencies and corresponding actions.

38. Following the thrust of Intervenor's line of questioning on training and knowledge of accident consequence issues, the Board sought the position of the NRC Staff regarding whether it is necessary that each party involved in emergency planning have a clear understanding of the extent of a nuclear accident that may occur at the plant and thus an understanding of the level of preparedness necessary to meet the potential problems facing them. (Tr. 3445). Staff's witnesses Kevern and Richardson responded in the affirmative, but Kevern went on to explain that this means only that each indivicual or agency must be knowledgeable of the role which that individual or agency must carry out, and does not mean that all response personnel must have a detailed understanding of accident scenarios and the consequences associated with any particular scenario. (Tr. 3446).

39. Staff's witness Grimes, Director of the Division of Emergency Preparedness, Office of Inspection and Enforcement, confirmed Mr. Kevern's appraisal with the very practical observation that the emphasis in training on radiation matters must be upon carrying out the normal emergency functions rather than upon imparting any significant knowledge of radiation effects or plant accident parameters; i.e., firemen should be trained in extinguishing fires, policemen in law enforcement, etc. (Tr. 4593-93).

40. The Board agrees that it is not necessary, and neither practical nor desirable, that each individual or agency possess the same level of understanding of the many components of the emergency planning program. Knowledge and guidance on all issues must be present and available within the emergency organizations, but only as appropriate to the tasks assigned.

41. Mr. Thomas E. Longshore, Jr., Director of the Department of Public Safety for the County of Newberry, in response to questioning by the Intervenor on the responsibility of his office for public education, said that his office had striven to accomplish a degree of public education about what to do in the event of a nuclear accident through informational broadcasts and that this effort has been complemented by South Carolina Electric & Gas Company (Tr. 2016). Mr. Longshore did give the opinion that the more informed citizens are, the more likely it is that they

will survive when a need arises. (Tr. 2021). He stated also, however, that the interest of Newberry County in the preservation of life and property is best served by winning the trust and confidence of the population and asking the population to work with them following the instructions they are given because those instructions are given in their best interests. (Tr. 2017).

42. Colonel DeLoache and Colonel Boyd of the Richland County Civil Defense Agency [1/] responded to two more limited questions by Intervenor. Asked by the Intervenor whether there has been any effort on the part of South Carolina Electric & Gas Company to educate the public about what to do when they hear sirens, Colonel DeLoache responded that once the sirens are installed, there will be a much improved education program. (Tr. 2067) He also stated that currently SCE&G and Richland County were working on an educational materials to bring into the area (Tr. 2067).

43. Colonel DeLoache did not agree with Intervenor's statement that at this point in time the general public in the area is not well enough educated as to protective measures. (Tr. 2068).

44. In response to an Intervenor question concerning continuing public education, Colonel Boyd replied that

---

1/ At the time of the hearings, Colonel Boyd was the Director of the Richland County/City of Columbia Office of Civil Defense. Colonel DeLoache had just retired from that position effective June 30, 1981. (Tr. 2046-47).

he would ensure that there is a continuing public education program in the area of protective measures. (Tr. 2068-69). Colonel Boyd stated that SCE&G was working with them, had been helpful, and was expected to cooperate in the future. (Tr. 2069).

45. Mr. James Andonaegui, Coordinator for Lexington County emergency preparedness, in response to questions by Intervenor, said that his agency did intend to have an appropriate public education program. (Tr. 2135). He felt that getting people knowledgeable about what to do and what not to do is the "secret of the whole thing". (Tr. 2135-36).

46. Pressed by the Intervenor as to what information the populace in Lexington County should be given in the education program, Mr. Andonaegui said that he would consider imparting to them that information pertinent to them in the emergency evacuation plan such as, what the warning signals are, how the populace would be notified, where they would be expected to go, and what routes they would leave the area by -- not the pros and cons of the nuclear issue. (Tr. 2137-38).

47. Mr. Andonaegui did state that while at this point there are no television programs he is aware of to educate people as to the kinds of things that might be expected of them in an emergency situation, he felt that it might be helpful to have such a program. However, he pointed out

that the portion of his county within the 10 mile EPZ is only a relatively small area with a population and the persons in that area can be reached by more personal means such as town meetings as well perhaps as by mass media. (Tr. 2150-51).

48. Mr. George Douglass, Director of Disaster Preparedness of Fairfield County, stated that he has made appearances on various radio talk shows and has spoken at civic clubs in the area. (Tr. 2162). He agreed with Intervenor that public education is important and opined that a public education program should be geared to the fact that accidents could occur at the V.C. Summer Nuclear Plant and the public's role in evacuation, including instructions as to what the public should do during the period following the emergency (Tr. 2163). He would not put a great deal of emphasis on the impacts of an accident but would concentrate on explanation to the public of what they should do, how they should accomplish self protection. (Tr. 2163).

49. Ms. Judith P. Turnipseed, Information Specialist with the Division of Public Safety within the Office of the State Adjutant General responded to Intervenor's question as to whether she felt there needs to be more public education as to the potential impact of an accident. She said there always needs to be more public education and the public education program will continue and intensify around the V.C. Summer Plant concerning emergency preparedness and

response and what the public would be advised to do in an emergency. (Tr. 1946, 1953).

50. Ms. Turnipseed stated that there had been no reluctance on the part of the state agency representatives to go on talk shows to talk about evacuation but as yet there has not been an aggressive public education campaign (Tr. 1953-54). Up to the time of the hearings, her office had been working primarily in the emergency information area, that is organizing or working with the emergency broadcast system of educational television, but within several months of the date of the hearing (June, 1981) she expected to be aggressively back into the public education program. In no sense did Ms. Turnipseed conclude that what had been done to date or what was planned for the future was inadequate in the areas of emergency information and education.

Emergency Information Brochure

51. A part of the Applicants' public information program in response to the requirements of the NRC regulations and NUREG-0654 consists of publication and dissemination of a public information brochure. (Intervenor's Exhibit 4, Tr. 4008). The Intervenor seized upon an issue proposed as a contention by the Fairfield United Action ("FUA") and its unsuccessful bid to intervene in these proceedings.[2/] The

---

2/ We stated in our June 19, 1981 Order denying the NRC Staff's Motion to Strike, Among Other Things, Fairfield United Action's May 28, 1981 Prefiled Testimony, fairness required that we permit this Intervenor to utilize whatever of FUA's contentions and underlying bases therefore which were not stricken for some other reason.

allegation of FUA pursued by the Intervenor is that the public information materials (the brochure) distributed by the Applicants relative to radiological emergency response planning are inaccurate, intentionally deceptive regarding potential health effects of radiation, and present evacuation routes which could result in persons unwittingly evacuating through the plume. (FUA Contention 8).

52. Intervenor's case on the emergency brochure issue consisted of the brochure itself and his questioning the panel of SCE&G personnel whom he subpoened in regard to the emergency brochure as well as a few questions posed to other witnesses subpoenaed at the Intervenor's request and brief questioning of Intervenor's witness Kaku.

53. The panel on the emergency brochure appeared in response to a subpoena issued by the Board at the request of Intervenor which required the presence of those persons within SCE&G who were responsible for the preparation and/or review of the emergency brochure. (Tr. 2980).

54. The first individual, Mr. K.E. Beale, who was also the Applicants' chief witness on the overall emergency planning issue, is the emergency planning coordinator for South Carolina Electric & Gas Company. Mr. Beales' qualifications in connection with this issue were that, since 1964 he has had extensive experience in radiological monitoring and health physics supervision in the nuclear

power industry, as well as prior involvement in emergency planning. He has also had education and training in this area.

55. Mr. William R. Baeher was another member of the panel. He is Manager of Corporate Health Physics and Environmental Programs for the nuclear engineering and licensing group of South Carolina Electric & Gas Company. He has a B.S. in physics, a masters degree in nuclear engineering with a radiological science option and also has had extensive experience in radiological monitoring and health physics supervision. He had responsibility for formulation of the initial Georgia State Radiological Emergency Plan and responsibility for planning, development, and initial implementation of the Environmental Surveillance Program in that state. He has been with South Carolina Electric & Gas Company since 1973.

56. The next witness on the panel was Mr. Douglas C. Warner. Mr. Warner is Manager, Nuclear Fuel Management, within SCE&G's nuclear services department. He has both his bachelors and masters degree in nuclear engineering.

57. The final member of Applicants' panel was Ms. Rebecca M. McSwain, Supervisor of Nuclear Information for South Carolina Electric & Gas Company. Ms. McSwain holds a B.S. degree in Science Education and is pursuing a masters degree in teaching natural science. She is a former school teacher and has been with SCE&G for two years.

58. It will be useful at this point to describe the V.C. Summer emergency information brochure. Since it is a document intended for mailing without an envelope, the front of the brochure announces what it is -- V.C. Summer Emergency Information. The back of the brochure contains the necessary postage information and space for address. Upon first opening the brochure, one views a photograph of the facility under construction with text indicating the purposes of the brochure: to acquaint the reader with the V.C. Summer Nuclear Station and familiarize the reader with emergency procedures. The reader is told who developed the emergency plans for the 10-mile emergency planning radius and is advised where he may go to secure additional information about the plans.

59. The next unfolding of the brochure reveals the bulk of text, which is in a question and answer format. The first question is, "How does the V.C. Summer Station work?" In five one-to-three-sentence paragraphs, the reader is given a simple explanation. A simplified drawing of a reactor, a steam generator, and a turbine generator occupies the middle of the page.

60. The next three questions deal with radiation: What about radiation? How do you know how much radiation is given off? What about radiation from an accident like the one at Three Mile Island? The responses to these questions include discussion about natural background radiation and

radiation from the medical use of x-rays. There is discussion explaining radiation measurement units. There is discussion concerning radiation released at TMI with a comparison as to the amount one might receive flying 3,000 miles in a jet aircraft. There is a chart occupying a lower section of the pamphlet comparing amounts of low level radiation from common sources.

61. Next, there is a series of emergency response questions - What should I do if something goes wrong at the V.C. Summer Plant? How will I be notified? Will I need to evacuate my home if there is an accident at the nuclear plant? and What if I do have to evacuate?

62. The answers to the emergency response questions advise the reader that should something happen at the nuclear site endangering the health of the public, persons who may be affected will be notified immediately and told what to do. Readers are advised that, if a serious situation develops, a siren will sound and they are to go inside their homes and turn on the radio to an emergency broadcast station (a listing of which is also provided) for more information. Readers are further told that there is a range of protective actions which may be advised up to and including evacuation. The specific instructions on what to do in case of evacuation are contained in the response to the question "What if I do have to evacuate?"

63. The reverse side of the completely opened brochure shows a colored map of the approximate 10-mile EPZ divided into sectors with a legend at the bottom of the page showing which county each sector is in, what the primary evacuation routes are for the particular sector, and where the reception center for that sector is located.

64. The panel was first asked what health effects were referred to in the 25,000 mr number listed in the table as the level at which health effects can first be detected. Intervenor was told by Mr. Baeher that the 25,000 mr number refers to somatic immediate effects due to acute radiation exposure (Tr. 3004). Intervenor inquired whether somatic effects might be seen as a result of exposures at less than 25,000 mr. Mr. Baeher responded that below 14 rems (14,000 mr) somatic effects are almost impossible to see due to natural variations in population, and between 14 and 20 rems the probability of detectable somatic effects is low (Tr. 3005-3006). Intervenor then asked whether certain federal guidelines for public exposure might be a better level for the brochure to reflect than the 25,000 mr. Mr. Baeher responded that it might be if the purpose of the brochure were to discuss such federal guidelines (Tr. 3023). Mr. Baeher pointed out the limited size and the limited purpose of the brochure (Tr. 3023).

65. The Board recognizes the implications of the Intervenors questions in this area. A brochure such as this can influence public attitudes, depending upon what one emphasizes, in terms of health effects for instance (Tr. 3059).

66. The Board observes that it would be a fair idea in the sense of a working goal to present something which is objective and will outline the boundaries of the range in an objective way (Tr. 3062). We note in that regard that according to a direct statement introduced into the record by Ms. McSwain upon taking the stand (following Tr. 3001), the radiation exposure information chart is to be redone by the Applicants to better present the information for ease of reading and understanding.

67. The inclusion or exclusion of this chart does not appear to be crucial to compliance with regulatory requirements and guidance. If it is to be included, Applicants are committed to consider a change in those numbers (Tr. 3001). The NRC Staff suggested somewhat lower numbers (Tr. 3335-36).

68. The Intervenor next took exception to a part of the description of how the V.C. Summer Station works wherein there is talk about the "uncontaminated water in the second loop (steam line)" and subsequently the "spent, pollution-free steam". In response to Intervenor's questions concerning the technical accuracy of this language, Mr. Warner suggested that the modifying word "relatively" might appropriately be applied to each of the questioned terms. This is consistent with the observation of Mr. Kevern at page 14 of his prefiled testimony wherein he says that with respect to the contamination levels in the secondary loop,

the Applicants somewhat overstate the level of cleanliness of the secondary loop. (Kevern testimony, page 14 following Tr. 3281). Nevertheless,as Mr. Kevern further states, the purpose of that section of the brochure is to explain, in lay terminology, a pressurized water reactor nuclear power plant including the concept of a primary and secondary loop, and for that purpose the brochure provides an acceptable explanation of the plant. (Id.).

69. Concerned by the possible lack of comprehension on the part of the populace within the 10 mile emergency planning zone of the information contained in the emergency brochure, Intervenor asked Mr. Beale whether he felt that comprehension could be assured by mailing with no followup. (Tr. 3154). Mr. Beale responded that it was the intention of SCE&G to do a statistical survey of the populace around the station within the 10 mile EPZ to verify their understanding of the instructions contained within the brochure (Tr. 3154).

70. The Board notes also, as previously indicated, that Ms. McSwain identified (Tr. 3001) at least six areas for future revision of the brochure. In addition, as confirmed by Mr. Beale, she has restated SCE&G's commitment to conduct a statistical sample of the general public within the 10 mile EPZ to assess their awareness of the availability of information and what to do in case of an emergency. This sampling will provide the possible basis for future changes to the brochure.

71. The Board agrees with the overall evaluation of the Staff that the brochure is well done (Kevern testimony at page 14, following Tr. 3281) but agrees also with the conclusion already reached by Applicants themselves that there is room for improvement (Tr. 3001). Even without modification, however, the brochure as it exists appears to meet the requirements of the regulations as elaborated upon in Part II of NUREG-0654. With the modifications Applicant described, the matter of the brochure is mooted.

72. Staff's witness Grimes made the summary point on public education: While it is required that there be information made available on what actions should be taken by the public during an emergency situation; and while it is desirable to have information available and to educate the public immediately around the plant about the nature of radiation, it is not important and certainly not essential (as Intervenor would have it) that members of the general population have a comparable level of understanding of a nuclear accident and its risks as those persons most immediately involved in plant operation and emergency planning. (Tr. 4594).

Public Notification

73. Next, the Intervenor questioned witnesses on the issue of public notification, i.e. how it is that the public will be notified of the occurrence of an event at the V.C. Summer Nuclear Station which may require protective action up to and including evacuation.

74. As it eventuated, Intervenor's inquiries in this area centered on the question of Applicants compliance with Section 50.47(b)(5) of Part 50 of NRC regulations wherein it is provided in part that the Applicants, together with or through state and local response organizations, must provide means to give early notification and clear instructions to the populace within the plume exposure pathway Emergency Planning Zone. Appendix III to NUREG-0654 provides further discussion of the means for providing prompt warning and notification to response organizations and the population as will meet the requirements of the regulations.

75. The Applicants were installing at the time of the July and September hearings an acoustic alerting system (sirens) which will be designed to meet the requirements of Appendix III of NUREG-0654 (Beale testimony page 23, following Tr. 3002). Until a complete installation of that system, the Applicants are relying upon emergency vehicle sirens and door-to-door notifications (Id.)

76. Asked by the Intervenor what his understanding of public notification in the event of a general emergency would be, Mr. Longshore of Newberry county stated that when completely equipped, the Newberry County warning system will allow for outdoor warning sirens which will convey a message to the residents that they should tune to local broadcast media to acquire emergency information and instructions from those broadcasts (Tr. 2014). Mr. Longshore testified that he had assured that the public will know what to do by

virtue of local radio announcements broadcast over the last five years. These broadcasts featured recorded sounds of warning sirens indicating what the different patterns of those sirens mean. The bottom line message throughout the public broadcast is that, upon hearing an alert on an outdoor warning siren, residents should tune to local AM radio stations to receive emergency information (Tr. 2014).

77. The same general information is echoed by representatives of the other three counties-Richland County (Tr. 2056), Lexington County (Tr. 2130), and Fairfield County (Tr. 2161-62).

78. Colonel DeLoache, of the Richland-City of Columbia Emergency Preparedness Office elaborated upon the notification mechanism by explaining that the notification to his office would come from the plant using a ring-down telephone and that upon receiving this notification his office would give the authority for the sirens to be sounded, giving him time to notify the local radio stations so that when the siren is sounded those who immediately turn on the radio will be given immediate information (Tr. 2055-2056).

79. Colonel DeLoache and Colonel Boyd also described further the alternate means of notification involving a sheriff department airplane equipped with loud speakers, enforcement vehicles with sirens, volunteer fire departments, community organizations and other similar organizations whose cooperation they indicate they will have in assuring area wide coverage in a notification situation (Tr. 2066-67).

80. Mr. Andonaegui of the Lexington County Office of Emergency Preparedness likewise provided additional information indicating that in Lexington county there is a twenty-four hour a day operational communications center which complements a ring-down phone connected directly with the emergency operation center at the nuclear facility.

81. With reference to the second step of the public notification process, i.e., giving the public necessary information once they have been alerted to turn to their emergency broadcast stations on radio or television, refer to our subsequent discussion of the testimony of Mr. Bowers of the educational television network (paras. 174-176 infra).

82. With regard to messages that would be given to the public upon tuning into the emergency broadcast system stations, the Intervenor implied in questions to representatives of the Office of Emergency Preparedness Division of the Adjutant General's Office that information such as estimates of quantities of noble gases, radioactive iodine and particulate releases ought to be included in those messages. (Tr. 1943-44). The response by Ms. Turnipseed was that, in an attempt to keep messages short and specific as to what the listening audience should do, it was determined that the messages would be geared more toward the specifics of what people were to do in so far as evacuation and protection were concerned (Tr. 1944). Intervenor did not point to any authority for the proposition that such technical information should be included, and, indeed, it appears that there is none.

83. The effectiveness of Applicants' emergency notification procedure was also challenged by the Intervenor on the basis of an item noted as deficiency by the Federal Emergency Management Agency (Testimony of Jack D. Richardson, Attachment C, page 3 following Tr. 3287) wherein it was stated as follows: "A site emergency was declared at 10:15 a.m. but the EBS system was not activated until 10:50 a.m. thus, the required time to notify the public was greater than the 15 minute criterion. The current public alerting and notification system does not meet NUREG-0654/FEMA-REP-1 Rev.1 Criteria. Significant off-site radiation levels existed (simulated for exercise play) and the public was not notified in a timely manner."

84. As Mr. Richardson indicated in responding to Intervenor's question concerning that deficiency, the State disagreed with the merits of that criticism by pointing out that the 10:15 a.m. site emergency notification from the Summer Plant indicated no off-site readings and therefore no projected releases. Therefore, no protective actions were required (Tr. 3292). The provisions listed in Appendix I, NUREG-0654 do not require the activation of the public notification system at a time when there are no off-site readings and no projected releases. Mr. Beale agreed with the State's assessment of the situation (Tr. 4448-49). The requirements at the time of the exercise were met. However, the state has since changed the "trigger" level for public notification. Mr. Richardson reported that the State's

response committed that in the future, public information will be released over the emergency broadcasting system within 15 minutes after notification under any situation of a site emergency. This will be done as a conservatism on the part of the State (Tr. 3292).

85. While Mr. Richardson did not specifically agree with the State's reply to that criticism, he did admit that the difficulty was a problem with the scenario rather than the capability to notify the public and that he believes the capability to notify the public will be there once the complete emergency notification system is installed (Tr. 3294). The Board concludes that there is reasonable assurance that public notifications will be made in a timely manner.

Transportation

86. Transportation in the event of an evacuation is the next topic the Intervenor probed with his questions. The testimony of the witnesses subpoenaed by the Board at the request of the Intervenor constituted his direct case on the issue of transportation.

87. NRC regulations, 10 C.F.R. §50.47, do not contain any specific requirements regarding public transportation. Section 50.47(b)(10) does state that a range of protective actions must be developed for the plume exposure pathway EPZ for emergency workers and the public, but nothing specific is said about transportation. However, public transportation seems to be a factor in some aspects of evacuation time assessment studies (Appendix IV to NUREG-0654). In pursuing

this line of questioning, the Intervenor was probing the issues raised in Fairfield United Action's proposed Contentions 7E, F and P and contention 9 which read as follows (References to Section numbers and appendices are to NUREG-0654 as contained in FUA's proposed contentions):

> "Contention 7E.(II.J.8. and Appendix A). The Applicant has not developed realistic estimates of evacuation times and has not employed the methodology set forth in Appendix IV.
>
> "Contention 7F.(II.J.10.c). The Applicant has failed to provide adequate means for protecting those whose mobility is impaired by lack of vehicles.
>
> "Contention 7P.(Appendix IV). The Applicant has failed to comply with the requirements of Appendix IV for determining and describing evacuation times, has failed to establish the acceptability of the criteria used to establish evacuation times, and has failed to demonstrate the capability of Applicant and State and local governments to assure timely evacuation under accident conditions.
>
> "Contention 9. The State of South Carolina and the counties surrounding the Summer Station do not have the capability for implementing protective measures based upon protective action guides and other criteria as they apply to residents of the Plume Exposure Pathway who do not own or have access at all times to private vehicles."

88. Mr. Longshore of Newberry County was the first witness to be questioned by Intervenor on this subject and was asked whether he had been involved in making sure that the 4,500 residents of Newberry county within the 10 mile EPZ have adequate transportation in the event of an accident (Tr. 2003). Mr. Longshore responded that the Newberry County Emergency Plan has a transportation annex which is also addressed in the annex for nuclear emergencies, and

that they have addressed the availability of transportation facilities in the transportation annex (Tr. 2003-04). Mr. Longshore further explained that the inventories of the exact number of vehicles, their location and availability are continuously updated and maintained by a designated transportation officer who also happens to be the school bus maintenance supervisor in Newberry County (Tr. 2004).

89. Asked by the Intervenor whether he has a list of residents in the area who are either handicapped or without private transportation, Mr. Longshore said that such information is on file with the Department of Social Services and coordinated with the local social services agency and the Newberry County Council on Aging. Thus, to the best of his knowledge, Mr. Longshore replied, he had identified those persons (Tr. 2004-05). Mr. Longshore did admit that it may be possible that some persons might be omitted from that list (Tr. 2005).

90. Intervenor inquired whether Mr. Longshore had any concerns about the fact that school buses are normally driven by teenagers. Mr. Longshore replied that there was a concern and that as a result there is consideration being given to an alternate manpower force to operate the school buses and that as soon as a viable solution to that problem is arrived at, an amendment to the Newberry plan will be made (Tr. 2021).

91. According to Colonel DeLoache of Richland County, they will depend at least in part on the availability

of some 59 South Carolina Electric and Gas Company buses which he states could move a minimum of 1,500 people per hour (Tr. 2062). Asked by the Intervenor whether he had in hand a signed agreement from SCE&G which agreed to transport evacuees, Colonel DeLoache responded that he did (Tr. 2063).

92. Colonel DeLoache opined that, after the time a decision is made to initiate evacuation, he believes that some persons will be out within 15 minutes, some within 45 minutes, and some within an hour, depending upon the time of day and the activities in which the individuals were involved at the time (Tr. 2092).

93. Mr. Andonaegui, of Lexington County also indicated that, if transportation facilities were required beyond the local capability, they would look to SCE&G to make some buses available.(Tr. 2028). This was specifically mentioned in response to Intervenor's suggested hypothetical evacuation of an elementary school which lies outside of the 10-mile EPZ.

94. A high school lies within the 10-mile EPZ and Mr. Andonaegui indicated that the thirteen school buses located at that school would be more than sufficient transportation to evacuate the school if it became necessary (Tr. 2125).

95. Mr. Andonaegui stated that it would also be possible that other school buses would be available within the county inasmuch as one of the members of the emergency

operation center staff for Lexington county is the coordinator for all school bus transportation within the county and therefore he would have at his fingertips the availability of transportation resources (Tr 2142).

96. In terms of the evacuation time for the Lexington County residents within the 10-mile EPZ, Mr. Andoniegui, making the assumption that warning sirens are in place, stated that a transportation and evacuation time assessment made by Wilbur Smith and Associates (Applicant's Exh. 30B, Tr. 3222) indicated a total of 66 minutes would be required and that this includes 60 minutes for notification receipt and preparation by the population for evacuation. In short, only 6 minutes travel time would be necessary to evacuate the population to the reception center (Tr. 2156). The total population within the approximate 11 square mile area of Lexington county within the 10-mile EPZ is 712 persons (Tr. 2156).

97. Mr. George Douglass, Director of Disaster Preparedness for Fairfield County, was the next witness questioned by the Intervenor on the subject of transportation. In response to an Intervenor question, Mr. Douglass indicated that his office had determined that 20-30% of the 3,000 plus persons within the 10-mile EPZ would need transportation assistance (Tr. 2168). There are approximately 40 square miles within the 10-mile EPZ in Fairfield county (Id.). Mr. Douglass was aware that more extensive transportation resources

for evacuation might well be needed for evacuation of this area than some others because it is rural and a large percentage of the population may be impoverished (Tr. 2169), apparently taking into account that the family vehicle would not be at the residence at all times.

98. As to how this 20-30 percent of the population will be evacuated, Mr. Douglass stated that the County has arranged for buses and drivers to pick up and transport persons with the coordination and guidance of law enforcement, rescue, and emergency medical services. (Tr. 2170).

99. Mr. Douglass acknowledged that since students are normally assigned to drive school buses, special arrangements might be required in the event of an emergency when the student drivers were not available. Mr. Douglass indicated that the County has alternative plans. If, during school hours, an emergency occurs, buses will be readily available and the regular student drivers will be used to evacuate the students. However, in the event the emergency occurs during non-school hours or on the weekend or during vacation periods, the buses will be driven by their school bus maintenance drivers and shop drivers available from the Fairfield County engineering department. (Tr. 2180).

100. Asked by the Intervenor whether there would be enough school buses to accommodate school children and the additional non-school population in the event of an evacuation, Mr. Douglass responded that he feels there will be enough buses

since there are also additional buses and vans available through county agencies such as the Department of Social Services, the Council on Aging, the various rescue squads and fire departments as well as the emergency medical service vehicles. (Tr. 2181).

101. The Intervenor also questioned the Applicants' witnesses Kenneth E. Beale and John C. Cosby regarding evacuation times and transportation. Mr. Cosby is a transportation consultant with Wilbur Smith and Associates, the consulting firm which prepared the evacuation time assessment for the EPZ around the Summer facility. The firm is based in Columbia and has prepared a number of such studies for nuclear facilities around the country, as will be noted later.

102. Mr. Beale's prefiled testimony on FUA Contention 7E explained that in early 1980, SCE&G prepared estimates of evacuation times with the 10-mile EPZ but that the initial assessment was developed with no guidance from the NRC. In late 1980, Wilbur Smith and Associates was requested to prepare an evacuation time assessment study using the guidelines set forth in Appendix IV of NUREG-0654 (Beale Testimony, 12).

103. The Wilbur Smith and Associates study was submitted to the NRC Staff in April of 1981. The results of the study indicate that households with cars available can be mobilized and begin evacuation within 60 minutes of a warning with a total

time lapse from the moment of warning to the time the last car would leave the EPZ boundary under normal conditions of 81 minutes. (Beale Testimony, 13).

104. In response to FUA Contention 7F concerning transportation impaired individuals, Mr. Beale pointed out that NUREG-0654 referenced in the Contention related only to institutionalized or other confined individuals such as those in prisons or hospitals and that the 10 mile area surrounding the Summer Station has no such institutions (Beale Testimony, 14). He further pointed out that the county emergency plans have specific guidelines and instructions on the requirements for such matters. (Id.)

105. Mr. Beale's response to the allegations in FUA Contention 7P was to refer to the response on Contention 7E which indicated preparation of an evacuation time assessment study by Wilbur Smith and Associates in compliance with the guidance of NUREG-0654.

106. Mr. Beale's prefiled response to FUA Contention 9 was primarily a reference to the county plans and facilities.

107. Upon taking the stand, Mr. Cosby was asked by the Intervenor how he performed the study insofar as the mechanics involved in determining the 81 minute evacuation time are concerned. (Tr. 3161). Mr. Cosby said he used the standard procedure which his company had employed in a number of such similar studies performed for FEMA (TMI, Enrico Fermi,

Midland, Millstone, Shoreham, Beaver Valley, and Limerick (Tr. 3161, 3163).

108. The procedure used by Wilbur Smith and Associates involves identification of the emergency planning zone itself, the socio-economic conditions of the population in that area, and determination of natural boundaries which might divide that population into well understood or well accepted zones (which were in this case compatible with the 0-2 mile, 2-5 mile and 5-10 mile annular rings around the site) (Tr. 3161-62). Next they resorted to various statistical data including U.S. Census Studies and others to identify the numbers of people within each of the zones, the number of households with cars, the statistical average of population per household, and the numbers of households owning more than one car. With that information they determined the population per household and the approximate number of people in the households without cars. (Tr. 3162).

109. After the population information was processed, they then determined available highway facilities relative to each zone and established an evacuation network designed to lead the population radially away from the site and related this network to the households, resulting in further subdivision of each evacuation zone and traffic planning zone. (Tr. 3162-63).

110. The data thus gathered was applied to a computer model (which has been used in studies for other nuclear

facilities as mentioned above), which related the network of roads and their capacity with approximate operating speed to volumes of traffic assigned to each centroid. They then used the public response time distribution which is the statistical measure of the time within which persons will respond to warnings, prepare to leave their homes and actually leave their homes and enter the evacuation network. (Tr. 3163).

111. This model thus produced the times of travel from various centroids to the external areas of the emergency planning zone and it was on this basis that the figure of 81 minutes was calculated under normal conditions. (Tr. 3163).

112. Responding to the question by the Intervenor of where the buses for the transportation disadvantaged persons were to come from in his study, Mr. Cosby responded that the plan required buses from all counties affected. (Tr. 3166).

113. The estimates provided in the Applicant's evacuation time assessment study covered both normal and adverse conditions and took into account public transportation as well as private vehicles. This evidence was not controverted, and was consistent with the estimates of county planners recounted above. From the evidence, we are convinced that there is reasonable assurance that evacuation can, even under adverse circumstances, be accomplished in a most timely fashion.

Decontamination

114. Another subject about which Intervenor interrogated witnesses was the capacity of the emergency response agencies to provide the necessary decontamination facilities. Section 50.47 of Part 50 of the NRC Regulations makes no specific reference to decontamination facilities. NUREG-0654, in Part II, Section 5.4., K.5.a., K.5.b., and K.7 does specify evaluation criteria for emergency plan coverage of decontamination, but primarily for emergency workers. FUA proposed no contentions encompassing this issue, and the Intervenor's contention did not clearly cover it. Nevertheless, the matter of decontamination for the public as well as emergency workers is one the Board chose to consider without objection.

115. Mr. Longshore was the first to testify on this subject. In response to a question by the Intervenor as to what the contaminated individual in his county should do, Mr. Longshore explained that, assuming there were no complicating injuries, decontamination would be the first step and that the decontamination would be accomplished at the reception center provided for those persons being evacuated from the 10-mile EPZ. (Tr. 2009).

116. Mr. Longshore further explained that a radiological monitoring team would review each person coming into the evacuation center, and determine whether or not that person had suffered contamination. (Tr. 2011). Such

decontamination or monitoring would be conducted under the supervision of local radiological defense officers, of whom there are three, including himself. (Tr. 2012). If his county's ability to respond to decontamination requirements were exceeded, Mr. Longshore indicated that he would request the state emergency preparedness division to provide additional manpower. (Tr. 2011).

117. For Richland County, Colonel DeLoache explained that they have monitoring teams to oversee these decontamination procedures and that they have established a decontamination point at the Ballentine Fire Station with a possible backup at the Columbia Bible College. (Tr. 2074). Explaining further how the procedure would work, Colonel DeLoache said that the population would be instructed to take clean clothes with them. The contaminated clothes would be collected and cleaned. (Tr. 2074).

118. Asked by the Intervenor what would happen if the Ballentine Fire Department happens to be in the plume exposure pathway, Colonel DeLoache repeated his statement about the availability of the Columbia Bible College and he communicated also the availability of the State Park Hospital. Showers are available at all of these facilities. (Tr. 2075-76).

119. Mr. Andonaegui, Coordinator for Emergency Preparedness in Lexington County, was first asked whether a

statement on page Q-22 of the Lexington County Emergency Plan was still correct. That statement, which is item number 13 on that page, reads as follows:

> "Lexington County does not have the capability for determining the need for a decontamination; Lexington County will rely on the State which retains this responsibility in SC Technical RERP."

Mr. Andonaegui responded that that has not changed except in the respect that if he had sufficient monitors of the needed sensitivity and contamination were detected, people could be asked to take showers. (Tr. 2133). Thus, as it stands, the state will perform this function for Lexington County.

120. Asked what would happen if it were determined that someone was contaminated, Mr. Andonaegui responded that they would simply be asked to take a shower, and of course they would be checked again and would dress in clean clothing. (Tr. 2134). The Board sought clarification of a comment by Mr. Andonaegui indicating that the ambulance drivers are trained to detect contamination levels of individuals and presumably make a determination whether some individual might need to be decontaminated. (Tr. 2145). Mr. Andonaegui confirmed that this was correct and added that not only are most ambulance drivers trained in radiological monitoring, but they are all qualified emergency medical services personnel and the majority are advanced medical technicans, i.e., paramedics. (Tr. 2145-46).

121. The Board was additionally concerned whether there would be sufficient changes of clothes available in Lexington County for all the individuals who might need to be decontaminated. Mr. Andonaegui said that the people would have their own clothing with them to change after showering and in addition, his office does have a number of sets of army fatigues which could be used for that purpose. (Tr. 2146-47).

122. Responding to a Board concern as to what would happen with wash water used to decontaminate large pieces of equipment such as police cars or fire equipment, Mr. Andonaegui said that a temporary dike of some variety could be constructed surrounding the vehicles in a parking area to prevent the water from entering the normal drainage system and that if the temporary dams or dikes constructed with the equipment at hand proved to be inadequate, other equipment within the Department of Public Works such as bulldozers and road scrapers could be called into service if necessary. (Tr. 2147-48).

123. Mr. Douglass of the Fairfield County emergency organization was asked who accomplishes decontamination at the reception Center in Fairfield County. He responded that the Social Services (apparently referring to the county social services group) will do it for the most part and that they are trained to monitor for contamination and will be assisted by the county emergency medical services personnel. (Tr. 2182).

124. As expressed by General Wise of the Office of the Adjutant General, the National Guard has some firefighting units whose firetrucks could be used to decontaminate vehicles. (Tr. 2210).

125. Applicants' witness Beale, during the hearings on September 22-24, supplied additional information for the record concerning decontamination capabilities in the area as conveyed to Mr. Beale by representatives of the various county organizations. Mr. Beale testified that Lexington County has available to them seventy-two showers for decontamination purposes; Richland County has sixty-nine showers available; Newberry County has forty showers available; and Fairfield County has twenty-four showers available. (Tr. 4446). In addition, there are portable facilities which can supplement the fixed facilities. The U.S. Army installation near Columbia, South Carolina, Fort Jackson, has several decontamination units. (Tr. 4446-47). On the record, adequate resources for decontamination of emergency workers and the public have been provided.

Medical Facilities

126. Section 50.47(b)(12) of Part 50 of the NRC's Regulations specifies that arrangements are to be made for medical services for contaminated, injured individuals. Section L of Part II of NUREG-0654 provides evalution criteria to determine the acceptability of emergency plans with regard to this requirement.

127. The Board noted in its order of September 14, 1981, ruling on the admissibility of Dr. Kaku's testimony, discussed later, that there appear to be no numerical criteria in NRC regulations or guides against which to judge the adequacy of the provisions made by the Applicants and the governmental agencies involved for treatment of contaminated, injured individuals. This would be a problem if the demand which might reasonably be placed on such facilities were shown to be very great and the capacity of such facilities comparatively limited. Neither turned out to be the case here.

128. In addition to arguably fitting within the Intervenor's stated contention, as a shortcoming in Applicants' arrangements with off-site agencies, the medical facilities question was raised in two of FUA's proposed contentions, contentions 7K and 7L. They read as follows:

> "K. Hospital and medical services for the general public are not provided for.
>
> L(II.L.2.) Onsite emergency first-aid capability is inadequate."

129. Mr. Longshore of Newberry County was asked by the Intervenor whether his organization has arrangements for local and backup hospital and medical services. (Tr. 2007). He responded that they did and they were using Newberry County Memorial Hospital as the primary receiver of emergency cases within Newberry County (Tr. 2008). They have backup emergency

agreements whereby Richland Memorial Hospital is used as a secondary point and on occasion Self Memorial in Greenwood, South Carolina is utilized. (Tr. 2008). The Newberry County Memorial Hospital does have some ability to deal with radiation contamination emergencies due to the fact that it has a Department of Nuclear Medicine (Tr. 2008). Mr. Longshore did not know what the capacity of Newberry County Hospital was in terms of its ability to handle individuals in a situation of radioactive contamination. (Tr. 2009).

130. Asked about ambulance service in Newberry County, Mr. Longshore explained that in Newberry County, ambulance service is provided through the County Memorial Hospital, and in addition there are three volunteer rescue squads which provide emergency ambulance service. (Tr. 2039).

131. For Richland County, it was explained by Colonel Boyd that Richland Memorial Hospital will handle those people who have a wound or injury as well as contamination with radiation. Oak Ridge would be the backup for treatment of any individuals who were exposed to very high doses of radiation. (Tr. 2077). According to Colonel Boyd, it would be up to the radiation medical department of Richland Memorial to determine whether an individual had had such exposure as to radiation to warrant transfer to Oakridge. (Tr. 2078).

132. The Intervenor asked how many people Richland Memorial

Hospital can handle and was told by Colonel Boyd that they can handle between 10 and 50 individuals. Beyond that it may be necessary to request the assistance of Moncrief Army Hospital at Fort Jackson. (Tr. 2079). He further postulated that they could move a number of their people to the Orangeburg and Kershaw areas as well as Newberry and Fairfield. (Tr. 2080).

133. For Lexington County, Mr. Andonaegui was unable to say with certainty how many individuals the Lexington County Hospital could accommodate, but did estimate 10. (Tr. 2134-35).

134. In response to a Board question concerning backup medical capabilities, Mr. Andonaegui said the County Medical Officer of Lexington County would be responsible for knowing which hospitals are available and making those determinations with the Chief of Staff of the hospital. (Tr. 2149). He also mentioned the possible availability of Richland Memorial Hospital and Moncrief Army Hospital. (Id.) In Fairfield County, Mr. Douglass testified that for persons that might require hospitalization, his county had an arrangement with Richland Memorial Hospital. (Tr. 2182-83).

135. Mr. Beale testified that SCE&G had agreements with two medical facilities -- Richland Memorial Hospital and Oak Ridge, Tennessee (Tr. 3138) with reference to exposed

workers at the plant. (Id. and Beale prefiled testimony in response to to FUA Contention 7K.)

136. During the time between the close of the June - July hearing sessions and the resumption of hearings in September, Mr. Beale was able to secure additional information concerning overall capacity of area hospitals. According to Mr. Beale, in the Richland County area, Providence Hospital has said it will receive 14 patients who are contaminated; Richland Memorial Hospital has said they would receive up to 24 contaminated patients. (Tr. 4442). In Lexington County, the Lexington County General Hospital has said they could receive 4 contaminated, injured persons. (Tr. 4442-43). In Newberry County, Newberry County Memorial Hospital has indicated it would receive radiological or contaminated patients but did not specify a number. (Tr. 4443). Moncrief Army Hospital at Fort Jackson which is in Richland County has indicated it would receive 25 contaminated and injured patients as a backup to other area facilities. (Tr. 4443). As to available capacity in the rest of the State, Mr. Beale was able to identify 28 hospitals which could receive contaminated and injured individuals; although a number of individuals for each facility was unavailable, at least one each can be counted. (Tr. 4443). Finally, the South Carolina National Guard has indicated that within their

available mobile hospital units there are approximately 400 cots. Mr. Beale also noted backup capacities in North Carolina, Georgia and Tennessee. (Tr. 4444).

137. There appeared at one point to be some confusion concerning the capacity of Richland Memorial Hospital to treat injured, contaminated persons. Mr. Boyd had mentioned 10 to 50 such persons. Mr. Beale testified at one point that Richland Memorial Hospital could handle about 4 people at any one point in time. (Tr. 3263). An affidavit of a staff member of the Richland Memorial Hospital, Dale Campbell, indicated that Richland Memorial Hospital radiation emergency area has four treatment areas. Mr. Beale clarified that there are four treatment rooms, meaning that after injured persons who are contaminated are decontaminated, they can be moved to other areas or other rooms as ordinary patients. (Tr. 3264). Then, taking into account other areas of the hospital which could be pressed into service, the total was raised to 24 contaminated injured persons at Richland Memorial. (Tr. 4442). No doubt Mr. Boyd had in mind rooms available once patients were decontaminated.

138. Mr. Jack Richardson of FEMA, who testified on behalf of the NRC staff, in responding to FUA Contention 7K at page 8 of his prefiled testimony, stated that the State had identified 22 hospitals in the State as being capable of

handling radiologically contaminated patients. (This figure is somewhat less than the figure given by Mr. Beale, but was evidently based on an earlier survey by the state than Mr. Beale's September data from state sources). He explained that the State plan lists hospitals which can receive and process for further treatment specific cases of radiological contamination and stated that minor cases of contamination will be treated by showers and new clothing while more serious cases will be treated by medical personnel and local hospitals with transfer to regional medical centers as necessary. (Richardson testimony, p. 8 following Tr. 3287). The Board is satisfied that adequate capacity is available for contaminated, injured persons.

139. The Intervenor presented no testimony and asked no questions with regard to FUA's Proposed Contention 7L. The only evidence on the record concerning this Contention is the prefiled written testimony of Mr. Beale on behalf of the Applicants. (Beale testimony, 19.) Mr. Beale indicates that the nuclear plant and SCE&G corporate offices have implemented ongoing first-aid training programs and that annual refresher training on first-aid will be given to Summer Station personnel to maintain a proper level of preparedness for basic first-aid applications. Further, the Summer Station Radiation Emergency Plan provides in Table 5-1 that as a minimum, two people will be available on shift for purposes of rescue and first-aid. In the

circumstances, there is nothing for us to resolve on the first-aid matter.

Potassium Iodide

140. A matter allied with the medical services question is that of the availability of thyroid blocking agents for members of the public and emergency workers. FUA Proposed Contention 7G (II.J.10.e.) states that no plans have been made for the distribution and use of potassium iodide for the general public.

141. Section 50.47 of Part 50 of NRC Regulations does not mention thyroid blocking agents. Section 50.47(b)(10) merely specifies that a range of protective actions must be developed for the plume exposure pathway EPZ for emergency workers and the public.

142. Section J of Part II of NUREG-0654, in paragraph e, specifies that provisions must be made for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons within the plume exposure EPZ whose immediate evacuation may be infeasible or very difficult.

143. The State of South Carolina Technical Radiological Emergency Response Plan, in section B.V., states a policy on potassium iodide as a thyroid blocking agent. (Applicants' Exhibit 15(b).) That statement is simply that the State through the Emergency Preparedness Division will procure adequate supplies of potassium iodide to provide a stockpile

near each fixed nuclear facility to supply emergency workers and persons that are unable to readily evacuate a particular zone. In addition, a reserve stockpile will be maintained in Columbia and be available for rapid delivery to an area as required. The Commissioner of the Department of Health and Environmental Control (a licensed physician) will be responsible for ordering the administration of the drug. This is consistent with the prefiled response of Mr. Beale. (Beale testimony, 15). This is also consistent with the testimony given by county witnesses: Longshore, Boyd, Andonaequi, and Douglass. (Tr. 2013, 2083, 2135, and 2191 respectively. See also Shealey, Tr. 2246). As was the case with the first-aid matter, we see nothing requiring resolution here; if there were we would resolve it in favor of adequacy of the planning and implementing arrangements.

Crop & Livestock Contamination

144. Another area of questioning by the Intervenor is the matter of livestock and food crop contamination and provisions which may have to be made to allow for the care of livestock remaining in an evacuated area. (See our discussion of related testimony infra.)

145. Section 50.47 of Part 50 of the NRC regulations does not specifically address agricultural and livestock contamination or contingencies relative to the feeding and care of livestock remaining in evacuated areas. However, Section J of Part II of NUREG-0654, in expanding upon the requirements of Section 50.47(b)10), specifies that state and local

capabilities for implementing protective measures based upon protective action guides and other criteria should be consistent with the recommendations of the Department of Health, Education, and Welfare (now DHHS)[3/] / Federal Drug Administration regarding radioactive contamination of human food and animal feeds. (NUREG-0654, Part II, Section J. 9). It also provides that each State should specify the protective measures to be used for the ingestion pathway, including the methods for protecting the public from consumption of contaminated food stuffs. This should include criteria for deciding whether dairy animals should be put on stored feed. (NUREG-0654, Part II, Section J.11).

146. Appendix I to the South Carolina Technical Radiological Emergency Response Plan (Applicants' Exhibit 15(b)) contains protective action guides for milk and food which list contamination levels for various radioactive isotopes as protective action indicators. The Plan requires, among other things, that the Bureau of Radiological Health of the Department of Environmental Control analyze food stuffs produced in the ingestion zone EPZ and recommend interdiction of items exceeding the stated limits. The Plan further provides that the Bureau of Radiological Health will recommend sheltering of dairy animals in the event of a release of iodine, cesium or strontium; fodder and forage will be

---

3/ i.e., the Department of Health and Human Services.

analyzed to determine the need for continued shelter. (Id. Section I-4).

147. In addition, Appendix II of the State Technical Radiological Emergency Response Plan contains a description of offsite radiological monitoring equipment and programs which include monitoring of such things as particulate and gaseous air samples, surface water samples, ground water samples, potable water samples, raw milk samples, soil and/or bottom silt samples, fish and/or shellfish samples, and vegetation samples.

148. Other than asking a few questions to county representatives as to their role in determining the need for food crop seizure and/or placing livestock on stored feed, to which he received responses consistent with the program identified in the State Technical Radiological Emergency Response Plan, the Intervenor did not elicit any information requiring the Board's resolution on this matter. It does not appear that there is any evidence of failure of Applicants to make required arrangements with governmental response bodies. The Intervenor did ask Ms. McSwain, of the Emergency Information Brochure panel, whether the brochure will be revised to include information concerning the agricultural or livestock considerations, and Ms. McSwain responded that it would be. (Tr. 3071).

Emergency Exercise

149. A critical step in the process of arriving at

approved emergency plans for the state and local governments as well as the Applicants is the successful conduct of an emergency drill. Section 50.47 of Part 50 of the NRC Regulations at paragraph (b)(14) requires that periodic exercises be conducted to evaluate major portions of emergency response capabilities, that periodic drills be conducted to develop and maintain key skills, and that deficiencies identified a result of exercises or drills be corrected. Section II N of NUREG-0654 specifies evaluation criteria against which Applicants, state and local plan provisions for drills and exercises are to be judged.

150. Neither the Intervenor's contention nor FUA's proposed contentions specifically targeted emergency exercises and drills for criticism. Rather, the successful exercise tends to disprove the alleged lack of coordination in the implementation phase of emergency planning.

151. On May 1, 1981, a radiological emergency exercise was carried out for the Summer facility to test the integrated capability of the Applicants and the state and local governments as well as a major portion of the basic elements of the emergency preparedness plans and organizations. (Beale Testimony, 4; Richardson Testimony, 3). One should keep in mind the distinction between the gradually escalating scenario for the May 1, 1981 emergency exercise and the drastic accident scenario postulated by Dr. Kaku on behalf of the Intervenor. The scenario for the exercise simulated a gradually

deteriorating situation in which each of the four categories of emergency was reached in sequence, (Tr. 4448) while Dr. Kaku's scenario would result in almost immediate declaration of a general emergency. Dr. Kaku's hypothetical scenario is discussed separately toward the end of this Supplemental Partial Initial Decision.

152. While some of the responses of witnesses questioned by the intervenor reflected, as stated by them, their experiences in the emergency drill conducted on May 1, the Board relies heavily on the assessments of the NRC Staff and FEMA since theirs appear to be the only integrated analyses of the exercise provided for the record, and includes detailed findings and recommendations.

153. The Board notes that Section 50.47(a)(2) requires the NRC to base its finding (1) that state and local emergency plans are adequate and capable of being implemented on a review of the FEMA findings and determinations and (2) that the Applicants' on-site emergency plans are adequate and capable of being implemented on the NRC's own assessment. It is further provided that, in any NRC licensing proceeding, a FEMA finding will constitute a rebuttable presumption on the question of adequacy.

154. As earlier indicated, Mr. Jack D. Richardson, Acting Regional Director, Plans and Preparations Division, Region IV of the Federal Emergency Management Agency, appeared for the NRC Staff on this subject. Mr. Richardson holds a degree

in education. He served for 13 years in the private sector before joining the Defense Civil Preparedness Agency as a regional field officer and subsequently as Director of the Field Services Office from 1973 to 1979 when FEMA was formed by an Executive Order of the President. In addition to his other responsibilities, Mr. Richardson serves as Chairman of the Region IV Radiological Assistance Committee (RAC) composed of members from the Department of Energy, the Department of Transportation, the Environmental Protection Agency, the Food and Drug Administration, Department of Health and Human Services, the NRC, and the U.S. Department of Agriculture. In 1981 Mr. Richardson was named as Acting Director, Plans and Preparedness Division, FEMA Region IV. In that position, he is charged, among other things, with the management and direction of plans and preparedness programs and staff.

155. In his prepared testimony, Mr. Richardson first gave an assessment of the state and local agency plans in response to Intervenor's contention. He concluded that the plan would be effective in reducing injury or hardship to local citizens and is capable of being implemented. He noted that there were a few minor exceptions and deficiencies which have been noted to the responsible state officials and which he expected would be corrected. He testified further that the limited number of deficiencies noted in the exercise indicates that the Applicants and the state and local governments have

engaged in extensive coordination of their plans.

156. In describing the nature of the emergency exercise conducted at the plant on May 1, Mr. Richardson explained that it was a substantial exercise involving all major components of the emergency response forces and that it provided for a real time review of individuals and organizations as to their knowledge and abilities to protect the public in the case of a general emergency. (Richardson Testimony, 3).

157. FEMA comments on the emergency exercise were contained in Mr. Richardson's letter of May 8, 1981 (Attachment C to Richardson Testimony) to the Director, Emergency Preparedness Division, State of South Carolina. It lists deficiencies observed during the exercise. Mr. Richardson concludes that if the State corrects these deficiencies, he would have no reason to believe that the plan could not be implemented as well, if not better than the exercise. (Id.)

158. The Board notes further with regard to Mr. Richardson's letter to General Wise, that the final paragraph congratulates South Carolina for the excellent radiological emergency preparedness effort. (Richardson Testimony, Attachment C).

159. In addition to Supplement 2 to the Safety Evaluation Report Staff Exhibit 3 (Tr. 1057), the Staff presented the prefiled testimony of Thomas A. Kevern (following Tr. 3281).

Mr. Kevern is a nuclear engineer in the Emergency Preparedness Licensing Branch of NRC, Division of Emergency Preparedness, Office of Inspection and Enforcement. His position is that of Emergency Preparedness Team Leader and in that position he is responsible for the review and evaluation of emergency plans pertaining to nuclear power plants. He has the responsibility of reviewing the emergency plans pertaining to the V.C. Summer Nuclear Station. Mr. Kevern has a Bachelor's Degree in Industrial Engineering and a Masters of Science Degree in Systems Management. Mr. Kevern has had significant nuclear experience in the U. S. Navy.

160. Mr. Kevern's prefiled testimony related entirely to the proposed Fairfield United Action contentions. As an attachment to his testimony, however (Attachment D), he has included a copy of Report No. 50-395/81-09 of the Nuclear Regulatory Commission which is the report on the May 1 emergency exercise.

161. According to the report, the inspection involved 253 inspector hours on-site in the area of a coordinated radiological emergency exercise. The overall result as stated on the first page of the report was that in the areas inspected, no violations or deviations were identified. The report goes on, however, to give a detailed, point-by-point assessment (Attachment D, beginning at page 5) of compliance with the standards set forth in Section 50.47 of Part 50

of the NRC Regulations.

162. It was noted that deficiencies were identified by SCE&G as a result of the exercise and that essentially all the findings described in the NRC report were identified by the Applicants' personnel. This speaks well of the Applicants' desire and willingness to carry out the purpose of exercises and drills which is in no small part to identify weaknesses so that they may be corrected. (Id. para. 20).

163. As an overall exercise evaluation, paragraph 22 of Report No. 50-395/81-09 stated that the inspectors concluded that the emergency exercise for the V. C. Summer Nuclear Station demonstrated the Applicants' ability to respond to and effectively manage an emergency condition at the facility and that the state of emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. We agree. We also conclude, as evidently did the NRC Staff, that the "deficiencies" noted in the report are not such that they cannot be adequately addressed and rectified by the Applicants in a reasonable fashion, leading to the expectation of satisfactory implementation of emergency plans.

164. With regard to the remainder of Fairfield United Actions' proposed contentions which the Board may have

not directly addressed thus far in its findings, the Board notes that Mr. Beale, on behalf of the Applicants, Mr. Kevern, on behalf of the NRC Staff, and Mr. Richardson, on behalf of FEMA, each in turn submitted written responses to those contentions. To the extent the matters raised by those contentions or any other matter adverse to licensing have not already explicitly or implicitly been disposed of in these findings, the Board finds that such found no evidentiary support and are resolved against the Intervenor.

Coordination With And Readiness Of Secondary Agencies

165. In addition to calling the officials directly responsible for emergency planning in the four-county area involved in the planning for the V.C. Summer nuclear plant as well as the state officials directly involved in emergency planning for nuclear facilities, Intervenor Bursey called representatives from a number of agencies less directly involved. He apparently hoped to demonstrate their lack of training in and knowledge of emergency planning issues and the failure of coordination between those agencies and the county and state entities most directly involved in drafting and implementing emergency plans. Mr. Bursey's efforts proved just the opposite as will be disclosed in the following discussion. The Board was impressed with the overall level of involvement and coordination on the part of myriad

agencies having responsibilities in the state and local emergency planning efforts.

166. Mr. Robert MacMillan, Assistant Director of the Transportation Division of the South Carolina Public Service Commission, testified that he served in the function of Transportation Coordinator. When a request for transportation for evacuation is received, the Emergency Preparedness Division of the State Adjutant General's Office would call upon him. (Tr. 1772-73). As a coordinator for transportation, he in turn would look to the South Carolina Department of Education to provide school busses where necessary. (Tr. 1776). Should it become necessary to arrange private sector busses to assist in evacuation, he was confident that he could promptly arrange for private busses. (Tr. 1777).

167. Mr. William H. Funchess, an agricultural extension leader with Clemson University responsible for off-campus educational programs in 14 counties in South Carolina, testified that he had been involved in development of the emergency plans as they related to his agency. (Tr. 1802). He listed the responsibilities of his agency in the event there was a nuclear incident requiring their involvement. Some of these responsibilities include: advising as to the location of possible acreages of edible crops, berries, fruits, etc., in the contaminated area; advising as to the location and size of dairies in contaminated area; advising as to the location and number of livestock and

poultry in the contaminated area; advising as to on-farm storage of grain and edible agricultural products in the contaminated area; advising as to available shelter for livestock in the contaminated area; advising as to wholesale distribution sources for agricultural products in the contaminated area; advising as to available stored grain and other feed and silage for animals in the contaminated area; furnishing information and inspectors for assessing damage to farms; providing guidance and assistance to agencies who are responsible for evacuation and care of livestock; coordinating, identifying and establishing evacuation reception areas for livestock and effecting return of such animals to the owners; assisting in the decontamination or disposal of livestock, feed, milk and other contaminated farm products; assisting in the control of livestock and agricultural products exposed to radiation or contamination; providing informational and educational material to farmers, ranchers, and others on protective measures for themselves and their property against hazards associated with disasters; and finally, providing advice on clean-up of damage to property, sanitation precautions, insect controls, and food preparation in disasters, and advice for recovery actions for damaged farms and renovation of damaged equipment or property. (Tr.

1803-1804). He testified that he has assembled a list of dairy producers, agricultural producers and agricultural water resources in the four county area nearest to the nuclear plant. (Tr. 1807).

168. In response to a question by the Intervenor as to whether the agricultural contingency plans are well enough developed at this point for the farmers in the 10 mile zone or even the 50 mile zone around the plant to feel comfortable, Mr. Funchess responded that he felt that the plan is well enough developed and that his agency has the mechanism to get the information immediately out to the farmers whenever it is needed. (Tr. 1814). There was no significant evidence in the record to refute Mr. Funchess' statement. Intervenor adduced inconclusive testimony reflecting understandable concerns (which were for the most part to do with compensation for damages and beyond the scope of the proceeding) through his witness Coleman, to whose testimony we now turn.

169. Charles Howard Coleman is a beef cattle and dairy farmer who lives within ten miles of the facility. (Tr. 1822, Coleman Affidavit, p. 2 following Tr. 1828). He testified at the request of the Intervenor. He expressed concern about the impact an ordered evacuation might have upon his operation, particularly in terms of any requirement that his livestock be placed on stored feed. (Tr. 1823-24). His concerns seemed primarily financial and he suggested

that the applicants should bear the financial burden (Tr. 1824, Coleman Affidavit, p. 3). He also suggested a need to plan a means for evacuated dairymen to get back in an evacuated area to feed and milk the cows. (Tr. 1825). He was perhaps not aware that the need for dairy farmers to reenter the evacuated area had already been recognized and a procedure developed. (e.g., Tr. 2060). He observed that he had not spoken with a representative of either Clemson University or Applicants (Tr. 1822) and that he felt a need for more knowledge about the emergency plans (Tr. 1826). He did not contradict any of Mr. Funchess' testimony.

170. Intervenor also called Mr. J. T. Hance, a staff forester in the central office of the South Carolina Forestry Commission. Mr. Hance testified that he usually works with the Disaster Preparedness Agency (State of South Carolina) in the Forestry Commission's cooperation with them. (Tr. 1846). According to Mr. Hance, the role of the Forestry Commission in a possible accident involving a radiological release at the V.C. Summer plant is to provide back-up communication with the Forestry Commission's two-way radio net between the Forward Emergency Operations Center (FEOC) and the State Emergency Operations Center (EOC). (Tr. 1846). They also provide a person with the Forestry Commission in both centers who can make decisions on behalf of the Forestry Commission in commitment of resources in

support of an emergency operation. (Tr. 1846).

171. Questioned about training for its members, Mr. Hance responded that his agency has participated in an exercise for the H.B. Robinson nuclear plant in Hartsville, South Carolina and in the drill conducted on May 1, 1981 for the V.C. Summer nuclear plant. (Tr. 1847).

172. During the Summer drill, the Forestry Commission actually did provide backup communications on the backup net between the FEOC operations center and the State Emergency Operations Center and as he indicated they would do, his agency had a decision maker located at each of the facilities during these exercises. (Tr. 1847-48).

173. Asked whether the Forestry Commission personnel had had any actual training as to what might be entailed in a rescue mission in a radiological hazard zone, Mr. Hance responded that they had not but that he did not feel it would be necessary to have that training in order for his agency to fulfill its function in an emergency situation. Instead, they would depend on the Emergency Preparedness Office and the Forward Emergency Operations Center to let them know of any radiological hazards. Personnel in these centers in turn would check with the Department of Health and Environmental control people at those centers. This would be one of the purposes for having a decision maker at each of these centers, i.e., to determine

how long their people could stay in contaminated areas. (Tr. 1848). Mr. Hance did testify that the Forestry Commission personnel had been given instructions on how to read dosimeters. (Tr. 1849). Intervenor drew nothing from this witness which would cast doubt upon his agency's ability to fulfill its assigned functions in a radiological emergency.

174. Mr. Charlton Bowers, Director of Engineering for South Carolina Educational Television (S.C.E.T.V.) testified next. He testified that the role of his agency is to provide a direct communication channel to the public from the State Emergency Operations Center. This communication would include a visual communication channel consisting of on-camera information originating in the State EOC which would then be carried over their network or any portion of the network, radio or television. (Tr. 1857). Mr. Bowers testified that there is a set of equipment and a circuit which is permanently installed in a central location and all that is required in the case of an emergency is that it simply be turned on. (Tr. 1857).

175. Asked how he would verify that a message requested to be aired is legitimate, Mr. Bowers testified that a message would not be broadcast unless he were told to broadcast by a representative from the Governor's office whom he recognized. (Tr. 1858-59).

176. Concerned with a seeming delay in initiation of the emergency broadcasts during the May 1, 1981 drill for the Summer facility, the Intervenor asked Mr. Bowers about his participation in the May 1, 1981 exercise involving the Summer Nuclear Station. Mr. Bowers testified that there was no lag time in their ability to fulfill their roles, or at least not more than a minute or so. There was very little hesitation in Mr. Bowers' responses to questions concerning his agency's role and their ability to carry that role out. Intervenor made no points adverse to the Applicants through this witness.

177. Another agency which has an apparently peripheral role in support of others is the State of South Carolina Fire Marshal's office. The testimony of representatives of this agency was not as satisfying as testimony of witnesses on behalf of other agencies. But perhaps this is due in part to the fact that the office of the State Fire Marshal has only recently been created in its present structure and apparently even the overall functions of the office were not at the time of the hearings well defined. (Tr. 1868, 1991-92). Mr. Harvey Scurry was the first witness to testify on behalf of that agency.

178. Mr. Scurry testified that the functions expected to be performed by the State Fire Marshal's office as

presented to it by the Office of Emergency Preparedness are to assist in decontamination, participate in drills which may be conducted in the future, and have agency personnel trained in the use of equipment for radiation protection. (Tr. 1863-64).

179. The State Fire Marshal, Richard S. Campbell, testified subsequent to Mr. Scurry. He confirmed that his office was not familiar in detail with responsibilities it might have in support of other agencies in an emergency situation, but did indicate that with the proper training and funding he felt sure that his agency could participate. (Tr. 1993). Since the Fire Marshal's office is at most a resource for additional personnel if needed, who can be instructed and directed to tasks at the time, we need not weigh their evident lack of involvement thus far against the overall readiness of the state and local response capability.

180. Mr. Robert Gifford, Assistant Chief, Law Enforcement for the South Carolina Department of Wildlife and Marine Resources testified next. Mr. Gifford testified that Wildlife's participation in the development of the emergency plan was based upon their capabilities vis-a-vis their resources such as equipment and personnel. (Tr. 1870-71). His agency has responsibility for communication, search and rescue operations, keeping the water areas surrounding the V.C. Summer Nuclear Plant, secure from entry notification of

persons who might be on land or water recreational areas around the plant. (Tr. 1871).

181. Mr. Gifford testified that his agency has several aircraft including a helicopter equipped with a P.A. System which could be used in the event there was need to notify persons in remote places such as on lakes or in game management areas. (Tr. 1871). According to Mr. Gifford, his department has utilized these resources successfully not only in exercises, but in actual search and rescue operations. (Tr. 1871).

182. Asked by the Intervenor whether he felt his agency could take responsibility for notification of civilians within the ten-mile emergency planning zone and wooded areas, Mr. Gifford responded that he thought they could. (Tr. 1873).

183. Mr. Gifford testified that his agency has sent personnel to training sessions conducted by the State Emergency Preparedness Division to familiarize them with radiological monitoring devices and has also sent a number of people to training sessions conducted by the South Carolina Department of Highways and Public Transportation concerning monitoring devices and dosimeter readings. (Tr. 1873-74).

184. The Intervenor questioned Mr. Gifford on the degree of knowledge he and his personnel had concerning possible impacts of an event which would cause a large release of radioactivity. (This question reflects a recurring theme in Intervenor's case on emergency planning to the effect that without a full understanding by participants in the emergency plans as well as the public at large of what dangers they may face in the event of a major release of radioactivity, emergency planning efforts will fail in the implementation phase. The main discussion on this aspect has been provided above). Mr. Gifford responded that they had been briefed on the fact that they could only leave people in areas of contamination for certain periods of time, depending upon levels of radiation and that a primary concern would be whether or not people might be left too long in an area. (Tr. 1880).

185. In response to a question by Judge Linenberger as to whether he felt that the kinds and depth of briefings they had received had been adequate for him and his people to do their jobs, Mr. Gifford responded that he did feel that it was adequate, that he felt safe with it and that his belief was based not just upon the knowledge that he and his people have, but on the knowledge and expertise that other agencies such as the Department of Health and Environmental Control have, and the information that they can give to his

personnel. (Tr. 1880-81). Mr. Gifford further made the point that though in his estimate the training of his people in the ability to respond to a general emergency has been adequate, that training would not stop, but would be a continuing process. (Tr. 1881).

186. Mr. Gifford, in response to question by Judge Linenberger, gave further testimony concerning the interface between his agency and the South Carolina Forestry Commission. He indicated that while there was no written agreement between the two agencies, the Forestry Commission supports the Department of Wildlife and Marine Resources in the Emergency Planning Process and that if the need should arise, Wildlife would need only to contact the Forestry Commission to secure the use of their personnel, equipment, and other resources. (Tr. 1882-83). Mr. Gifford's testimony was uncontroverted.

187. Colonel Philip Meek, Director of the South Carolina Highway Patrol, testified next. He testified that the primary duties of the Highway Patrol in regards to emergency planning for the V.C. Summer Plant will be in the area of traffic and population control and security of the affected areas. (Tr. 1887). He stated that the patrol is well trained, prepared, and will perform their duties in a

proficient manner if the occasion arises. (Tr. 1887).

188. Specifically, Colonel Meek testified that in the event an alert is issued at the Summer plant, key personnel in the Highway Patrol Headquarters staff will be notified by the State Emergency Preparedness office. Upon a briefing on the situation, Patrol personnel throughout the state and the affected area would then be alerted in case an emergency situation is declared. Patrol personnel, previously trained and assigned to tasks in the area, would respond and perform those assigned tasks. Highway Department maintenance personnel would transport and establish road barricades at pre-established locations. (Tr. 1886).

189. According to Colonel Meek, the Highway Patrol has sufficient trained personnel to block immediately the two mile emergency planning sector and control entry or exit 24 hours a day if necessary, and should it become necessary to block off other sectors, each officer will have a map showing the individual sector concerned and each officer has been on-site and knows their duties. (Tr. 1887).

190. Highway Patrol officers throughout the State have received radiological monitoring training. (Tr. 1887).

191. The Highway Patrol has participated in two nuclear station emergency drills to date, including the May 1, 1981 drill for the V.C. Summer Nuclear Station. (Tr. 1887).

192. Queried by the Intervenor as to whether the Highway

Patrol personnel have been advised in their training courses of what to expect in a bad accident at the V.C. Summer Plant, Colonel Meeks responded that they have been advised to expect the worst and that while he himself does not have a notion of what the worst amounts to, he could imagine it could be a terrible thing. (Tr. 1890-91). This did not seem to affect his confidence in his department's ability to fulfill their assigned role.

193. Captain Leo Floyd McSwain, Administrative Training and Planning Officer for the State Highway Patrol, also testified. Captain McSwain provided further information concerning training of the patrolmen for radiological emergencies. He testified that the training entails self-protection, i.e., how to read the dosimeter and to be sure that they are safe at all times. (Tr. 1975). He testified further that the training did entail what would happen to the officers or to the public if they were exposed to radiological contaminants above certain levels. (Tr. 1975). He testified that they understood the level at which fatalities could be expected and that all men expected to be stationed in the area in the event of a nuclear emergency have been trained in this respect. (Tr. 1976). In fact, he testified that all the officers in the State had been trained in that respect except for perhaps five who may have been on leave or who were sick at the time of training. They will be trained at a future time. (Tr. 1976).

194. J. Leon Gasque was next to be called as a witness by the Intervenor. Mr. Gasque is an agent with the South Carolina Law Enforcement Division, commonly called SLED. SLED is the investigative arm of the Governor of the State of South Carolina. (Tr. 1900). The mission of SLED in the event of a nuclear accident, as described by Mr. Gasque, will be to provide security for the EOC and the FEOC and to be able to do the same things in either of those places if they are relocated for any reason at all. In response to questions by the Intervenor as to what type of training his agents receive in radiological response to emergencies, Mr. Gasque said that they have had the training provided by the Department of Health and Environmental control with regard to personal hygiene, health, protective clothing, and what should be done with regard to personal safety in these situations. (Tr. 1902). The agents of SLED are trained in the use of personnel dosimeters. (Tr. 1902).

195. The next to testify at the request of the Intervenor was Mr. William Smith Comer, an employee of the South Carolina Department of Social Services. Mr. Comer explained that his role in a radiological emergency at the V.C. Summer plant would be the same as in any other emergency situation, i.e., to serve as coordinator of the State Emergency Welfare Services. (Tr. 1912). This means that

his Agency is responsible for ministering to the basic needs of individuals affected, that is, so far as food, clothing and shelter are concerned. (Tr. 1913). Emergency Welfare Service is composed not only of the Department of Social Services but also the State Department of Education, the Salvation Army and the American Red Cross. (Tr. 1913).

196. The Department of Social Services' responsibilities are to shelter people, to feed them and to provide clothes. (Tr. 1914-15). Mr. Comer opined that with a relatively small statewide staff, his agency could coordinate a fairly sizeable number of reception centers and shelters since they are manned mostly by local, county social services personnel. (Tr. 1920). Thus, his agency has the ability to shift people around where the need arises. His department has offices in every one of the 46 counties in the State. (Tr. 1920).

197. It thus appears that the Department of Social Services is well aware of its responsibilities and has the capabilities and resources with which to meet those responsibilities.

198. Mr. Robert Raymond Hill was next called as a witness on behalf of intervenor. Mr. Hill is the Deputy State Superintendent of Education for Administration and Planning.

According to Mr. Hill, his Agency has four support roles in the event of a radiological emergency: transportation, shelter, feeding and communications. (Tr. 1921).

199. Insofar as transportation is concerned, Mr. Hill said that his department has some 6,000 school busses and other vehicles which support the school bus transportation system, and that these vehicles would be available for use in a coordinated fashion in the event of a disaster. (Tr. 1922). In the event of a nuclear emergency requiring the use of those vehicles, the Public Service Commission, as previously explained by Mr. McMillin, would have the responsibility of coordinating the use of those vehicles. (Tr. 1923). The Department of Education's role in sheltering relates to the fact that under the Emergency Welfare System in South Carolina, school facilities are designated as potential shelters. Thus Mr. Hills' responsibility as an agent of the Department of Education would be to work with Social Services in identifying facilities available and geographically pinpointing their location for use. (Tr. 1927). The feeding function goes hand-in-hand with the sheltering function. (Tr. 1928).

200. The communications function is served through the Department's communications network. All county transportation shops have communications equipment and as do many

of the vehicles. This network would be a back-up capability. (Tr. 1929).

201. Asked by the Intervenor whether the Department of Education is planning to absorb any costs which would result from participation in an actual emergency, Mr. Hill explained that, in past disaster situations, resort was had to the Governor's Emergency Welfare Fund which, inferentially, would be relied upon. While the Department itself does not have a line item budget for those costs (Tr. 1930), there was no evidence adduced that the Department of Education could not perform its functions.

202. Next to testify was a panel of witnesses representing the South Carolina Governor's Office of Public Safety. The panel members were Ms. Judith P. Turnipseed [4/] and Mr. Gaines O. Boone. Mr. Boone is an Administrative Assistant for Comprehensive Emergency Management within that office, and Ms. Turnipseed is a Public Information Specialist.

203. Asked by the Intervenor to elaborate on his responsibilities if an accident were to occur at the Summer station, Mr. Boone replied that the Governor's office provides direction and control in the sense that they provide operational personnel for the Forward Emergency

---

4/ Ms. Turnipseed was questioned concerning public [illegible]ication and public education efforts. This was discussed at an earlier point herein.

Operations Center and for the State Emergency Operations Center. Additionally, they are responsible for dissemination of public information. (Tr. 1936).

204. Mr. Boone explained the command structure at the PEOC (Tr. 1936-37) and said that any decisions made would be made in consultation with those persons and if necessary, with the Governor himself. (Tr. 1937).

205. In the event of an evacuation, the Governor is the one person in South Carolina who has the power to order an evacuation and the responsibility of their section of the Governor's Office would be to furnish the Governor with the necessary information and to solicit guidance in ordering an evacuation or getting the Governor's authority to order an evacuation. (Tr. 1937).

206. Intervenor seemed to be concerned that decisions concerning lesser protective actions than evacuation may be hampered if it is necessary to consult with or receive instructions from the Governor in each situation. As to this concern, Mr. Boone responded that those decisions would be made based on information available and with the best minds present to make them, and that of course if there were time to do it, the Governor may be called. (Tr. 1938). The implication is that unless it were absolutely necessary to call the Governor (as in the case of a recommendation for an evacuation), the Governor would only be called directly if

there were time to do so. The Governor will not necessarily be consulted about lesser decisions. (Tr. 1939).

207. In responding to Intervenor's question concerning who pays the bill for emergency planning and preparation for implementation as well as implementation itself, Mr. Boone replied that the Governor's position in supporting agencies and supporting the development of the capability to react to nuclear accidents was well known: he has enthusiastically supported the development of adequate fixed nuclear response plans. (Tr. 1939-40).

208. Mr. Boone substantiated the reference by Mr. Hill, to the Governor's Emergency Welfare Fund. (Tr. 1940). He explained that this fund had been drawn on in connection with other emergencies, such as the occurrence of Hurricane David. (Tr. 1940).

209. The import of Intervenor's questions was to test whether the foregoing agencies knew and understood their roles in emergency response and had personnel and equipment capabilities to fulfill their designated functions. As previously indicated in the Board's remarks, the testimony of each of these individuals from agencies having any substantial role (thus excepting the State Fire Marshal's office), spoke well for planning, training, personnel and

equipment resources, communications and capabilities. Representatives of these agencies displayed knowledge of what the roles of their agencies would be, what the capabilities of their agencies to fulfill those responsibilities are, and an apparent understanding of the relationship their functions have to those of other agencies involved in an emergency response to nuclear incidents. For the one agency whose response was not strong, the Fire Marshal's office, it is apparently contemplated that their role is to provide an additional personnel resource which could be called upon as needed and it further appears that their support role can be fulfilled with a minimum of on-the-spot instruction and direction.

Dr. Kaku's Accident Scenario

210. We now turn to the portion of the record which pertains to Intervenor's claim that Applicants' arrangements with state and local agencies will not function effectively, in the event of a very large accident as postulated by Intervenor's witness Dr. Kaku, unless sophisticated technical training regarding possible nuclear accidents, medical effects of radiation, and plume behavior is acquired by state and local officials, including first line emergency workers such as bus drivers, and unless the public within the emergency planning zone is educated on these same

matters. The procedural history of Dr. Kaku's testimony as to an accident scenario is sketched in our Memorandum and Order of September 14, 1981. In that Order, we excluded much of Dr. Kaku's amended prefiled testimony but stated that, if offered, (as it subsequently was, Tr. 3898), we would admit (1) two paragraphs (numbers 9 and 10), which we took to be illustrations of initiating conditions that might precipitate the implementation of emergency plans and (2) the major portion of his postulated accident sequence (in his paragraph 14), beginning at 12:00 and ending with the penultimate sentence at 7:00 o'clock. (September 14, 1981 Memorandum and Order at 4, 8).

211. In that Order, we also stated why we were willing to admit the portions of Dr. Kaku's testimony just identified over the strenuous and continuing objections of Applicants and the NRC Staff. Those objections were stated in their pleadings of August 7 and August 21, 1981 (Applicants) and August 7 and August 20, 1981 (Staff) as well as on the record and in May 22, 1981 objections to our "Remainder of Order Following Fourth Prehearing Conference" served May 24, 1981 as more specifically referenced in the pleadings just mentioned. We based our ruling on Dr. Kaku's qualifications, on our conclusion that his testimony, as revised, did not necessarily challenge or contravene any binding regulation, on our willingness to permit the Intervenor

to pursue his case in regard to need for technical sophistication on the part of responsible officials and education of the public, and on our own concern regarding the failure of the regulations to quantify how extensive the available medical facilities need be.

212. We stated in our Memorandum and Order that while we were not persuaded by Applicants' arguments that Dr. Kaku was not an expert on reactor safety or emergency response matters and that he should not be permitted to give expert testimony on the admitted matters, we would take into account any deficiencies in his qualifications in weighing his testimony.

213. Drs. Budnitz and Stratton, and Messrs. Beale and Storz testified for the Applicant concerning Dr. Kaku's accident scenario. Dr. Budnitz received a B.A. degree in physics from Yale University and M.A. and Ph.D. degree in physics from Harvard University. He served as Deputy Director and later a Director of Research at the NRC. He has served on several distinguished reactor safety panels, including the American Physical Society Study of Light Water Reactor Safety, the Lewis Committee, and the Rogovin Inquiry Group that studied the TMI accident. (Tr. 4159-4161). Dr. Stratton received A.B. and Ph.D. degrees in physics and math from the University of Minnesota. He has worked extensively in the area of reactor safety at Los Alamos National Laboratory, was a member of the Advisory Committee on Reactor

Safeguards, and the Kemeny Commission. (Tr. 4165-67). Mr. Beale's qualification have been previously discussed. Mr. Storz is currently employed by SCE&G as operations supervisor at the V.C. Summer Nuclear Station. He has a degree in mechanical engineering and previously worked as a design engineer for safety systems with a reactor vendor. He has prior nuclear experience as a Navy reactor operator and as a licensed RO and SRO for Wisconsin Electric Power Company (Tr. 4459-4460).

214. Dr. Kaku did display unfamiliarity with certain basic concepts used in reactor operation and accident analyses and in particular in ECCS analyses. (e.g., Tr. 3616, 3638, 3694, 3697, 3698, 3742). Drs. Budnitz and Stratton were critical of major portions of his testimony as unreasonable, unrealistic, incorrect, out of date, and out of step with the vast majority of current scientific opinion. (Tr. 4174-76, 4178-79, 4187, 4207-53.) Dr. Kaku also did not claim expertise in medical matters (Tr. 4033) nor did he claim to be specifically knowledgeable regarding the emergency planning documentation in the case. Indeed, Dr. Kaku had not read any of the county, state, or Applicant emergency plans (Tr. 3644; see also 3628, 3673). He was not specifically familiar with the local demographic or geographic conditions. (Tr. 3631-32). He did not disagree with our assessment that he had disclaimed the ability to assess the ability of the responsible officials to carry out the plans.

(Tr. 3636). Drs. Budnitz and Stratton, both eminently qualified, were critical of Dr. Kaku's prepared testimony accident scenario. (Tr. 4174-76 and 4178-79). For these reasons, we have taken Dr. Kaku's testimony in those areas as reflecting views based on limited knowledge and selected reading and have not weighed them as heavily as the views of the more knowledgeable witnesses presented by the NRC Staff and by the Applicants.

215. As to the arguments of Applicants and the NRC Staff that Dr. Kaku's testimony challenged NRC regulations (despite his and Mr. Bursey's disavowals of that intention or effect), our Memorandum and Order of September 14, 1981 also explained that we did not find our admission of the testimony inconsistent with any regulation, though it might conflict with NUREG-0654 Rev. 1, at page 6. The NUREG recommends against isolating any single, specific accident sequence as the one for which to plan because of the variety and range of possible consequences resulting from different accident scenarios. We there stated our conclusion that NUREG-0654 was not binding on the Board, and further reasoned that, to the extent we were called upon to judge whether emergency facilities, equipment, methods, systems, and so on are "adequate" (10 C.F.R. §50.47(b)(9)), given that the regulation does not quantify how many contaminated injured individuals are to be provided for (10 C.F.R. §50.47(b)(12)), we thought it could be helpful to permit consideration of accidents at least in

a general way. Thus, to amplify what was implicit in what we stated there, we were disposed to entertain the specified portions of Dr. Kaku's testimony as tending to contribute to the development of a record which might give some indication of how many contaminated individuals would be involved.

216. We were alert to the possibility that if capacity for persons who were both injured and contaminated were shown to be extremely limited, we would then need to explore more closely what sort of demands might be placed on that limited capacity. As it developed, however, taking into account all of the evidence, we find that the record both as to the need for and as to the capacity of medical facilities is reassuring. That is, the weight of the evidence overwhelmingly supports the finding which we hereby make that, for the initiating events and release postulated by Dr. Kaku, the need for protective action would be identified and a General Emergency declared at a much earlier time than he supposed. Notification of the responsible officials and the public would also take place at a much earlier point, and evacuation of the appropriate areas would have been completed (or nearly completed) before the release reached the area in question. (Compare Kaku: Tr. 3911 (12:00, 12:05, 3:00, 5:00), 4014-17, 4040; with: Beale, Tr. 4418-26, 4505-08 and App. Ex. 39,

Tr. 4508; Storz, Tr. 4463-64 and 4554-59; and Kevern, Tr. 4595-97, 4603-06, and Kevern's "Emergency Preparedness" scenario, following Tr. 4603). That conclusion may be reached even taking Dr. Kaku's accident sequence (as opposed to his assumptions regarding emergency response intervals) at face value. When we factor in the testimony of Applicants' witnesses Stratton, Budnitz, and Storz, particularly regarding ECCS performance, (Compare Kaku Tr. 3931-32, 4040-41, 4023-24 with Budnitz, Tr. 4023-24, 4121-26); steam explosions (Tr. 4213-17, 4217-21); iodine releases (Stratton, Tr. 4195-98) and ECCS redundancy (Storz Tr. 4475-76), then the release might not occur at all or occur much later and/or involve much less radioactive iodine than is usually assumed for other purposes (e.g., 10 C.F.R. Part 100).

217. It was Dr. Kaku's thesis that if you took the delay and difficulties surrounding identification, notification, attempted corrective actions and so on during the TMI accident, and applied the time consumed in those circumstances to a much more severe accident, then a case could be made that emergency planning was still inadequate despite improvements in hardware, operator training, resources available to the control room personnel, and emergency notification and response capability since TMI. Not only has he not given adequate weight to post TMI-improvements (Tr. 4188-91), his thesis is fundamentally flawed. He tried to merge into a single event (1) the time involved in

identifying, assessing, and acting on a rather subtle event (which, according to Dr. Kaku, operators had then not been adequately trained to recognize and as to which they did not have adequate technical resources immediately at hand to devise corrective actions) and (2) the consequences of a very different accident involving a major release. His accident scenario was one which is readily and promptly identifiable and calls into play virtually programmed responses by the plant operators. (Tr. 4463-64, 4552-55, 4556-58). The evidence was convincing that Dr. Kaku's scenario would lead to very early declaration of the highest category of emergency, the General Emergency, and to prompt advice to responsible officials to commence protective measures for the affected areas or sectors. That would lead to evacuation of essentially all affected members of the public prior to the major release under his scenario. Even granting his oft-repeated five hours from initiating event to release (prepared testimony paragraph 14, Tr. 3938, 3949, and 3954) he totally misjudged the corresponding times when emergency actions would be begun and completed under his scenario. To the extent Dr. Kaku referred to panic on the part of evacuees in his scenario, any widespread panic such as to substantially impair orderly and timely evacuation would not be expected in light of prior experiences with evacuations. (Tr. 4237-43).

218. Dr. Kaku's recommendations were for further training of state and local people responsible for implementing the emergency plan down to the level of bus drivers and for additional educational efforts directed toward members of the public. (Tr. 4003-4006). Although interrogated by the Board as to what training state and local officials and emergency workers really need and why they need it (see e.g. Tr. 4064-67) Dr. Kaku was unable to give convincing reasons for his recommendations. He argued instead that a person such as a bus driver should have enough knowledge of radiation effects and plume behavior to be able to make his own extemporaneous decision as to the best route to take to avoid the plume. Dr. Kaku did not claim to be an expert in the area of what sort of organizational structure and accompanying delegations of authority and responsibility is most likely to lead to the desired result. Applicants' witness Dr. Budnitz did not claim to be an expert in this area either, but he had evidently devoted considerable thought and study to the problem in connection with his duties at the NRC as Deputy Director (and later Director) of Research and in connection with his service on the Rogovin inquiry. Dr. Budnitz' view was squarely to the contrary of Dr. Kaku. In essence, Dr. Budnitz' point was that if anything is likely to lead to chaos it is to delegate authority and responsibility to individual bus drivers to

each make their own selection as to optimum routes and to attempt to train them so that they can make such evaluation and route selections (Tr. 4250-53). In the circumstances postulated by Dr. Kaku, it seems to the Board only common sense that a bus driver finding his way blocked would select an alternate route which most nearly approximated the original route. (Tr. 4250-53). Dr. Kaku's recommendation was also contradicted by Brian Grimes who is the principal person on the NRC Staff with responsibility for emergency planning. At Tr. 4592-94, Mr. Grimes testimony was to the effect that most emergency response officials don't need nuclear expertise. His observations as to further education of members of the public was also to the same effect. At Tr. 4625-26, Mr. Grimes acknowledged that although nuclear expertise might be helpful in some situations, it was not essential.

Conclusions

219. In accordance with the Atomic Energy Act and the Commission's Regulations, and on the basis of the entire record in this proceeding and the foregoing discussion and findings, the Board concludes as follows. The application for operating license and the record of the proceeding contain sufficient information, and the review of the

application by the Staff has been adequate, to support (insofar as the matters before the Board are concerned) the following ultimate findings required in the regulations, in accordance with the provisions of 10 C.F.R. §50.57 and 10 C.F.R. §2.760a:

(1) There is reasonable assurance that the facility will operate in conformity with the application as amended, the provisions of the Act, and the rules and regulations of the Commission, including 10 C.F.R. §50.47 and 10 C.F.R. 50 Appendix E;

(2) There is reasonable assurance (i) that the activities authorized by the operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations, including those specified in the previous finding;

(3) SCE&G is technically qualified to engage in the activities to be authorized by the operating license in accordance with the Commission's regulations, including those specified in the first finding above; and

(4) The issuance of the license will not be inimical to the health and safety of the public.

220. Having considered and decided all matters in controversy among the parties related to operation and for which the record in this proceeding is closed (i.e. all except seismicity issues), the Director of Nuclear Reactor Regulation will be authorized to make such additional findings on issues not before the Board as may be necessary for issuance of an operating license for V.C. Summer Nuclear Station, Unit 1, if the seismicity issues remaining open are resolved by this Board in favor of licensing or as may be otherwise provided by law.

ORDER

221. In accordance with Sections 2.754, 2.760, 2.762 and 2.764 of the Commission's Rules of Practice, 10 C.F.R. Part 2, it is ordered that this Partial Initial Decision shall be effective immediately but subject to the provisions of 10 C.F.R. 2.764 and shall constitute the final action of the Commission regarding the issues decided at the time provided by the regulations, subject to any review pursuant to the Rules of Practice. Exceptions to this Partial Initial Decision may be filed by any party within ten (10) days after service of this Partial Initial Decision. A brief in support of the exceptions shall be filed within thirty (30) days thereafter, forty (40) days in the case of the Regulatory Staff. Within thirty (30) days after service of

the brief of appellant (forty [40] days in the case of the Regulatory Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

THE ATOMIC SAFETY AND
LICENSING BOARD

Gustave A. Linenberger, Administrative
Law Judge
Dr. Frank F. Hooper, Administrative
Law Judge
Herbert Grossman, Esq., Administrative
Law Judge and Chairman

Dated at Bethesda, Maryland

this _____ day of_____, 1981.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

SOUTH CAROLINA ELECTRIC & GAS COMPANY and	)	Docket No. 50-395 OL
SOUTH CAROLINA PUBLIC SERVICE AUTHORITY	)	
(Virgil C. Summer Nuclear Station)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Proposed Findings of Fact and Conclusions of Law in the Form of a Supplemental Partial Initial Decision" in the above captioned matter, were served upon the following persons by deposit in the United States mail, first class postage prepaid this 26th day of October, 1981.

Herbert Grossman, Esq.
Chairman, Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Frank F. Hooper
School of Natural Resources
University of Michigan
Ann Arbor, Michigan 48109

Mr. Gustave A. Linenberger
Member, Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Chairman, Atomic Safety and Licensing Appeal Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Chairman, Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

George Fischer, Esq.
Vice President and Group Executive- Legal Affairs
South Carolina Electric & Gas Company
Post Office Box 764
Columbia, South Carolina 29202

Steven C. Goldberg, Esq.
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Brett Allen Bursey
Route 1, Box 93-C
Little Mountain, S.C. 29076

Mr. Chase R. Stephens
Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Richard P. Wilson, Esq.
Assistant Attorney General
South Carolina Attorney General's
Office
P.O. Box 11549
Columbia, South Carolina 29211

John C. Ruoff
Post Office Box 96
Jenkinsville, S.C. 29065

Robert Guild, Esq.
314 Pall Mall
Columbia, South Carolina 29201

Joseph B. Knotts, Jr.