

50411/4402 S-EP-2
5/9/84 Staff EP-2

TESTIMONY OF FEMA REGARDING EMERGENCY PLANNING

CONTENTIONS ADMITTED BY THE BOARD IN THE CATAWBA PROCEEDING

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Q1. State your names and positions with FEMA.

A1. John C. Heard, Jr. - Chief, Technological Hazards Branch,
Natural and Technological Hazards Division,
FEMA Region IV - Atlanta, GA

A1. Thomas I. Hawkins - Emergency Management Program Specialist

Q2. Have each of you prepared a statement of professional qualifications?

A2. Yes, a copy of our statements of professional qualifications are attached to this testimony.

Q3. State the nature of the responsibilities that each of you have had with respect to your review of Catawba nuclear station units 1 and 2 emergency planning.

A3. John C. Heard, Jr.:

As Branch Chief, it is my responsibility to see that the Catawba Nuclear Station Emergency Response Plans for South Carolina and North Carolina are reviewed by the Regional Assistance Committee (consisting of eight other Federal dept./agencies) and the FEMA Region IV staff to assure that all NUREG-0654-FEMA-REP-1, Rev. 1 standards and criteria applicable to State and county government are met. Additionally, I have reviewed the South Carolina, North Carolina, and County Radiological Emergency Response Plans for the Catawba Nuclear Station. I have also reviewed the objectives and the scenario of the February 15-16, 1984 exercise, which were developed jointly by Duke Power Company officials and representatives from South Carolina and North Carolina. I participated as a Federal evaluator at the North Carolina State Emergency Response Team (SERT) Headquarters during the February 15-16, 1984, exercise. I reviewed and approved the post-exercise assessment report of the Catawba exercise.

Thomas I. Hawkins:

I have reviewed the North Carolina and South Carolina State and local radiological emergency response plans for the Catawba Nuclear Station; I have observed and assisted in the development of the objectives and scenario for the exercise of those plans; I observed and evaluated the S.C. FEOC operation during the exercise, and I have written a post exercise assessment report of the Catawba exercise. All of these efforts were accomplished as part of my responsibilities as the emergency management program specialist assigned to the liaison position between FEMA Region IV and the States of North and South Carolina.

Q4. What is the purpose of this testimony?

A4. The purpose of this testimony is to address joint intervenors contentions numbered 1, 3, 6, 7, 8, 9, 11, 14, 15 and 18.

Contention 1

Contention 1 provides:

See next page.

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1. Public information provided by Applicants and state and local officials is not adequate to ensure appropriate responses to notification procedures.

The principle source of information is Applicant's brochure, which is inadequate, intentionally deceptive regarding potential health effects of radiation, and misleading, in that:

A significant body of scientific evidence that indicates health effects at very low levels of radiation is not cited. Therefore, people with compelling reasons to stay (such as farmers tending to livestock) may not take the threat seriously, especially after being repeatedly told in the past that radiation is not particularly harmful, and that a serious accident is extremely unlikely. It does not indicate that there is danger in accumulated radiation dosage. It does not give adequate information on protection from beta and gamma rays. It does not specify how young "very young" is. There is no chart to indicate overexposure during non-routine releases or accident to put into perspective the possible dose received before or during an evacuation. It does not specify ingestion dangers from contaminated food and water. It does not specify the importance of getting to reception areas for registration for purposes of notification for evacuees' re-entry to their homes, nor of emergency notification for evacuees, accounting for fiscal aspects of evacuation and for the basis of establishing legal claims which might result from the evacuation, as specified in "Catawba Site Specific NUREG Criteria" p. B2, #3. In fact, citizens are told they may go directly to "stay with friends or

relatives living at least 15 miles from the plant" (p. 10 #5) Neither does it state that the reception areas exist to provide decontamination of people and vehicles. It states that in an emergency at Catawba, citizens "would be given plenty of time to take necessary action." This cannot be guaranteed in the event of a sudden pressure vessel rupture, where sheltering would be indicated. This eventuality is not mentioned. It assumes all recipients can read, and at a certain level of comprehension. As a primary source of information, it is imperative that all have access to and understanding of the emergency procedures to be taken. There is no information concerning the existence of a "plume exposure pathway," which would influence a citizen's choice of escape route. Although this information may be available via other media during a crisis, it is important for citizens to be aware of this phenomenon beforehand. Although the North Carolina state plan calls for emergency information to be distributed as detailed in Part 1, Section IV, 2,3, and 4, no such material other than Applicants' brochure has been made available. When and if such material is formulated, it should include information on points of concern as listed in this contention. The emergency brochure falsely reassures residents that they "would be given plenty of time to take necessary action" in the event of an emergency. In the event of a vessel rupture, such as one resulting from a PTS incident, a catastrophic failure of the containment is a proximate likelihood. In that event, significant releases would reach residents well before they were able to remove themselves from harm even under Duke's overly optimistic evacuation time estimates.

Q5. What are the requirements of FEMA regulations and what is the regulatory guidance with regard to the provision of information to the public for radiological emergency preparedness?

A5. NUREG-0654-FEMA-REP-1/Rev. 1, Section II, G, "Public Education and Information":

Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

Q6. What public information provisions have been undertaken, or are planned for radiological emergency planning for the Catawba facility?

A6. State of N.C. Emergency Response Plan, Part I, pp. 53-56; Gaston County Procedures, Part II, pp. 25-28; Mecklenburg County Procedures, Part III, pp. 27-30. South Carolina Site-Specific REP Plan, Annex "A", pp. A-2, 3; Catawba brochure; York County Emergency Operations Plan, Annex D, pp. D-1 to ~~D-5~~. SCORERP, Annex C, pp. C-1 to C-23.

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Q7. Is information made available to the public on a periodic basis on how they will be notified and what their initial action should be in an emergency?

A7. Yes. Via Catawba brochures, and, in N.C.: N.C. Emergency Response Plan, Part I, pp. 53-55; Part II, pp. 26-28; Part III, pp. 27-29. S.C.: SCORERP, Annex C, Appendix 1, pp. C-10, 11; York County Plan, Annex D, pp. D-14, 15.

Q8. Does the Applicants' brochure include sufficient educational information on radiation? Explain.

A8. Yes. Regional Assistance Committee (RAC), especially EPA, DOE, and Department of Health and Human Services (DHHS) representatives, have reviewed the brochure and found it adequate. Serving on the RAC are several health physicists and at least one nuclear engineer who have approved the brochure for technical and educational adequacy.

Q9. Does the brochure give adequate warning of the health effects of low level radiation, the danger of accumulation of radiation, and information regarding protection from beta and gamma radiation? Explain.

- A9. Yes, pp. 4, 5 of the brochure clearly states types of radiation, their effects and what protective steps can be taken.
- Q10. Is there need for a chart in order to inform the public how to estimate dose? Explain.
- A10. While there is no FEMA requirement for such a chart, the brochure chart (p. 5), is helpful in understanding sources and amounts of radiation on a comparative basis.
- Q11. Is it necessary that the brochure specify dangers from ingestion of contaminated food and water? Explain.
- A11. No, the planning standard and criteria of NUREG 0654 do not require that dangers from ingestion of contaminated food and water be specified in a brochure; however, the brochure does provide that water, milk and food supplies will be monitored on page 9 (bottom).
- Q12. Is the reference in the discussion of radiation in the brochure with respect to "very young" adequate? Explain.
- A12. While the NUREG standards do not require an explanation of radiation with respect to the very young, the brochure does explain on page 4 (bottom) that the very young are more likely to be harmed by radiation.
- Q13. Does the brochure provide adequate information on how the public may obtain additional information? Explain.
- A13. Yes, emergency management office~~x~~ phone numbers are listed on the front inside cover.
- Q14. Does the brochure provide adequate information for protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radio-protective drugs?
- A14. Yes, page 9, through remainder of brochure satisfactorily complies with the criteria of G.1. of NUREG 0654. There are no provisions for administering radio-protective drugs to the general public in the North Carolina or South Carolina plans. Also, information is provided in the York County plan, page Q-26.
- Q15. Does the brochure contain sufficient information concerning the existence of a "plume exposure pathway"? Explain.

- A15. While there is no reference to "plume exposure pathway", the brochure explains that if there were an accident at Catawba Nuclear Station, that the areas affected would depend on wind speed and direction (brochure, page 9).
- Q16. Is the brochure deficient in that it does not state that reception areas exist to provide decontamination of people in vehicles? Explain.
- A16. No, page 10 explains that shelters would have facilities for decontamination of evacuees and their vehicles.
- Q17. Is the brochure deficient in that it does not specify the importance of registration for purposes of (a) notification regarding later reentry of homes by evacuees, (b) emergency notification of evacuees and (c) establishing legal claims of evacuees? Explain.
- A17. No, the specifications of the importance of registration is not required by NUREG 0654. However, the purposes of registration are indicated on page 10 of the brochure.
- Q18. Is the brochure inadequate because the level of comprehension is inappropriate? Explain.
- A18. No, it is comparable to other brochures of the region reviewed and accepted by the RAC and FEMA. Also, the general public brochure is supplemented by a student brochure.
- Q19. Is the brochure inadequate because it indicates there is sufficient time available to take appropriate action? Explain.
- A19. No. In the event of a large release, sheltering may be a more appropriate protective action if adequate time is not available for evacuation.
- Q20. Is there adequate information regarding the special needs of the handicapped? Explain.
- A20. Yes, the front inside cover advises the handicapped to inform the emergency agency of their special needs.
- Q21. Have the principal points of contact with the news media for dissemination of information during an emergency (including the physical locations) been established in advance? Explain.

- A21. Yes, these contact points are established in accordance with NUREG 0654 and listed in the following plans: SCORERP, Annex C, p. C-3; S.C. Site-Specific, pp. A-2, 3; York County Plan, p. D-2; N.C. Emergency Response Plan, Part I, p. 56; Part II, pp. 26-27; Part III, p. 28.
- Q22. Have procedures for coordinated dissemination of information to the public been established? Explain.
- A22. Yes, and these procedures are listed in the following plans: SCORERP, Annex C, pp. C-9-11; York County Plan, Annex D, ~~p. 3~~ pp. D-6-9; S.C. Catawba Site-Specific, Annex A, p. ~~A-22~~; N.C. Emergency Response Plan, Part I, p. 55-56; Part II, pp. 27-28; Part III, pp. 28-29.
- Q23. Based upon your review, is the brochure adequate and is the emergency planning standard regarding public information satisfied? Explain.
- A23. Yes, using NUREG Planning Standard G, all five evaluation criteria, the RAC and FEMA have approved the brochure.

Contention 3

Contention 3 provides:

See next page.

3. The emergency plans do not provide for adequate emergency facilities and equipment to support the emergency response as required by 10 CFR 50.47(b)(8) in that:

a) the plans do not provide for sufficient uncontaminated food, clothing, and bedding for persons who are evacuated. The plan does not attempt to estimate these needs nor provide specific information on how they are to be met.

b) The plans do not demonstrate the unlikely proposition that just 14 reception center/shelters are adequate to register and process some 75,000 evacuees. Indeed, the Catawba Nuclear Station Site Specific Plan (Part 4, SCORERP) provides that "all evacuees, both those ordered and those spontaneous, will be processed through their respective reception centers" (p. B-2). With no clear plan for controlling entry and exit from the reception centers, and no restrictions on who may enter, it is very likely that reception centers will become overcrowded. Persons from outside the evacuation area will be understandably concerned about whether or not they have been exposed to radiation and might well proceed to a nearby reception center -- exacerbating problems of crowding that already loom as serious given the enormity of the task of processing EPZ evacuees at reception centers with limited space and supplies.

Q24. What is the purpose of relocation shelters?

A24. The purpose of relocation shelters is to register evacuees, monitor and decontaminate evacuees and vehicles if necessary, and to provide food, shelter and medical assistance to those evacuees who might need it for a limited period of time.

Q25. Do the State or Federal regulations require, or regulatory guidance provide, that evacuees must be processed through relocation shelters?

A25. No.

Q26. From FEMA's experience, what level of usage of relocation shelters by evacuees relying on such centers for shelter and a place to stay during an evacuation would be expected? Explain.

A26. Natural disasters experience indicates that approximately 20% of evacuees avail themselves of relocation shelters.

Q27. Do the plans adequately provide for "sufficient uncontaminated food, clothing, and bedding for persons evacuated"? Explain.

A27. These provisions are not required by NUREG 0654 to be contained in the plans; however, the brochure asks evacuees to bring bedding and extra clothing.

Q28. What are the plans for controlling entry and exit from the relocations centers?

A28. There is no NUREG 0654 requirement for controlling entry and exit from relocations centers; however, shelter SOP's generally contain these procedures.

Q29. Will the fourteen relocation shelters be able to adequately register and process the number of evacuees asserted by joint intervenors (85,000)? Explain.

A29. There are 38 primary shelters, not 14, and over 100 shelters. Also, as indicated in A26. above, only approximately 20% of the total 85,000 figure can reasonably be expected to seek public shelter.

Q30. Do NUREG 0654 standards require that provisions be made for sufficient shelters and uncontaminated food, clothing and bedding for evacuees?

A30. No, NUREG 0654 requirements regarding shelters are confined to requiring that the means for registering and monitoring evacuees at relocation shelters be described. This requirement has been met by the plans submitted.

Contention 6

Contention provides as follows:

See next page.

6. The emergency plans do not provide reasonable assurance that adequate protective measures can and will be taken ILO CFR 50.47

(a)(1)) in that:

c) There are no adequate provisions for preventing contaminated persons from entering a non-contaminated zone. The plans do not make clear whether or not registration at a reception center/shelter is mandatory or not; if mandatory, by what procedures will it be enforced and what effort will these procedures have on evacuation times and traffic flow?

- Q31. Is there a requirement that registration at relocation shelters is mandatory? Explain.
- A31. No. This is an option of the individual. Facilities are provided and their use encouraged.
- Q32. Would provisions for registration at relocation centers have an effect on evacuation times and traffic flow? Explain.
- A32. No. Shelters are outside EPZ, and located so that they do not affect evacuation times.
- Q33. Is it necessary that plans provide for preventing contaminated persons from entering a non-contaminated zone? Explain.
- A33. No. There is no NUREG 0654 requirement for this prevention.
- Q34. Are there such provisions for Catawba? Explain.
- A34. No. There are provisions for decontamination, however.
- Q35. Does failure to require registration at relocation shelters prevent a finding that emergency plans do provide reasonable assurance that adequate protective measures can and will be taken pursuant to NUREG-0654-FEMA-REP-1/Rev. 1? Explain.
- A35. No.

Contention 7

Contention states:

See next page.

7. The Applicants' emergency plans and public brochure and the plans of the relevant State and local authorities do not adequately address the preparations that should be made to achieve effective sheltering, nor the actions that people should take when advised to seek shelter. Hence, the plans and brochure fail to provide a reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency as required by 10 CFR 50.47(a)(1).

- Q36. What pre-planned preparations are necessary for effective sheltering in the event that protective action sheltering is required in a radiological emergency?
- A36. No pre-planned preparations are required by NUREG 0654 for in-place sheltering.
- Q37. What provision is made to advise the public of preparations that should be made for effective sheltering?
- A37. Brochure and listen to EBS and follow instructions.
- Q38. Are the applicant's emergency plans and public brochure adequate to inform the public with regard to preparations that should be made to achieve effective sheltering and what actions the public should take when advised to seek shelter? Explain.
- A38. Yes. As stated in A36. above, no preparations are required by NUREG 0654. The actions the public should take when advised to seek in-place shelter are given in the brochure and will be given in the EBS messages.
- Q39. Are the plans of the State of South Carolina and the State of North Carolina adequate with regard to preparations that should be made to achieve effective sheltering and advising the public what actions they should take when advised to seek in-place shelter? Explain.
- A39. Yes. These sections adequately advise the public of actions they should take when seeking shelter. S.C.: SCORERP, Annex C, page C-17; N.C. State Procedures, Annex D.
- Q40. Do the plans of the appropriate local authorities adequately address the preparations that should be made to achieve sheltering and indicate the actions that the public should take when advised to seek shelter? Explain.
- A40. Yes. These sections adequately advise the public of actions they should take when seeking shelter: York County Plan, p. Q-26, and Annex D; Mecklenburg County Plan, Part 3, p. 31; Gaston County Plan, Part II, pp. 29-~~20~~ 30.
- Q41. What standard of NUREG-0654-FEMA-REP-1/Rev. 1 does this concern relate to?
- A41. J.10.m.

- Q42. Does this concern with regard to adequacy of preparation for effective sheltering and advising the public as to what actions should be taken when seeking shelter prevent a finding that this standard is satisfied? Explain.
- A42. No, as explained above, the NUREG 0654 requirement relevant to the concerns raised by Contention #7 has been determined by FEMA to be satisfied.
Contention 8 - See next page.
- Q43. Describe the assignment of primary responsibilities for emergency response in the emergency planning for Catawba.
- A43. SCORERP, p. 7: In accordance with State law and written agreements (table 7.7), ~~to~~^{the} Department of Health and Environmental Control (DHEC) and the Emergency Preparedness Division (EPD) have been delegated the authority to coordinate off-site RER planning, training and response. Their duties are: DHEC - Technical radiological control; EPD - Operational control. Specific responsibilities of State agencies are listed on pages 11-19 of SCORERP and on pages 55-58; local government responsibilities are also listed in SCORERP on pages 55-58 and on pages 19-20; York County Plan, pp. 5-12 (also see chart of responsibilities p. 18). (The Departments of Crime Control and Public Safety (DCCPS) and Human Resources (DHR) have the primary responsibility for responding to emergencies resulting from an incident at the Catawba Station. However, any State agency may be tasked with an emergency mission.) N.C.: charts: Part I, State, pp. 28-30 (and p. 26); Part II, Gaston County, pp. 14-18; Part III, Mecklenburg County, pp. 12-16.
- Q44. Do the emergency plans of the States of North and South Carolina and the counties of Mecklenburg, Gaston and York assign clear and effective primary responsibilities for emergency response and specific responsibility of the various supporting organizations? Explain.
- A44. Yes, see A43. above, and, these assignments of responsibilities worked well in the Catawba exercise last February.
- Q45. What arrangements have been made with respect to primary responsibilities while the North Carolina State Emergency Response Team (SERT) assembles and travels from Raleigh to the South Carolina Forward Emergency Operations Center (FEOC)? Explain.
- A45. SERT does not travel from Raleigh to the South Carolina FEOC but locates at Douglas Airport. The N.C. area coordinator assists counties until SERT arrives at Douglas Airport. County governments are in charge of operations until the State assumes control in both South and North Carolina.

8. There is no reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency in that the emergency plans of Applicants, the States of North Carolina and South Carolina, and the Counties of Mecklenburg, Gaston and York fail to assign clear and effective primary responsibilities for emergency response and fail to establish specific responsibilities of the various supporting organizations. Conflict, confusion and lack of coordination are likely to prevail. Conditions may be the worst during the 7 to 9 hours after notification of state authorities of the existence of an accident at the Catawba Station while the North Carolina State Emergency Response Team (SERT) assembles and travels from Raleigh to the South Carolina Forward Emergency Operations Center (FEOC), located dangerously within the 10 miles EPZ at Clover, South Carolina.

The FEOC itself would require at least three and one-half hours to be assembled and staffed from Columbia, South Carolina. While the formal authority to order evacuation of the plume exposure pathway EPZ straddling the North Carolina-South Carolina border rests with the respective state governors, a confusing and ineffective array of consultative and delegative authority appears to cloud the lines of primary responsibility. The residual responsibilities of the respective County governments, agencies and the support organizations are either unspecified or inadequate to the task of effective protective response.

- Q46. Do the respective emergency plans of the State, and the local governments provide for clear effective assignment of primary responsibilities for emergency response during the period of time that it would take to establish and staff the FEOC? Explain.
- A46. Yes, local governments in both States would be in charge of emergency response during the time it takes to establish the SERT and the FEOC.
- Q47. What are the standards of NUREG-0654-FEMA-REP-1/Rev. 1 that relate to the concerns raised by the intervenors in this contention?
- A47. NUREG 0654, "A. Assignment of Responsibility", "H. Emergency Facilities and Equipment", "P. Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans".
- Q48. Addressing the appropriate evaluation criteria, have the primary responsibilities for emergency response by the State and local organizations within the emergency planning zone been assigned? Explain.
- A48. Yes. All items under Planning Standard "A", NUREG 0654, but one, have been approved by the RAC and FEMA. (Evaluation criteria item A.3. was found deficient in both States in the latest RAC plan review due to absent and/or inadequate letters of agreement from private sector agencies.
- Q49. Have the emergency responsibilities of the various supporting organizations been specifically established? Explain.
- A49. Yes. York County Plan, pp. 5-12; SCORERP, pp. 55-58; local government responsibilities also listed in SCORERP, pp. 55-58. N.C.: Part I, pp. 28-30; Part II, pp. 14-18; Part II, pp. 12-16.
- Q50. Has each principal response organization been staffed to respond and to augment its initial response on a continuous basis? Explain.
- A50. Yes. N.C.: Part I, pp. 26-27; Part II, p. 15; Part III, p. 15. S.C.: SCORERP, p. 11; York County Plan, p. 12.
- Q51. Have the respective State and local facilities and centers provided for timely activation and staffing enabling a finding consistent with standard "H" that adequate emergency facilities and equipment to support the emergency response are provided and maintained? Explain.

- A51. Yes. Generally, emergency facilities and equipment have been found adequate by the RAC and FEMA. (Evaluation criteria item H.11. has been questioned in the South Carolina plan review. We expect this to be corrected and noted in the State response before May 1, 1984. Plan provisions which address this question are as follows: SCORERP, p. 39, pp. 67-69, pp. 55-58; York County Plan, p. 15, Q-34-36, N.C. Emergency Response Plan: Part I, pp. 82-85 and Part II, pp. 39-42; Part III, pp. 41-45 and Attachment 3.
- Q52. With respect to Planning Standard "P", have the plans made adequate provision for an assignment of responsibilities for plan development and review and for distribution of emergency plans and proper training? Explain.
- A52. Yes. N.C. Emergency Response Plan, Part I, p. 99; Part II, p. 47; Part III, pp. 50-51. SCORERP: Annex B, p. B-1, p. 12, p. 38. York County Plan: p. Q-39, p. 8, p. 12; Site-Specific Plan: p. 20.

Contention 9

Contention 9 provides:

See next page.

9. The plans do not adequately provide for the early notification and clear instruction to state and local response organizations and the public that are required by 10 CFR 50.47(b)(5) in that:

Secondly, if the sirens do sound, not all citizens who would be affected and therefore require notification would be able to hear a warning siren. Such a situation could arise as a result of hearing impairments, weather conditions, distance from sirens, etc.

c) In the event of a power outage the public's access (and possibly the access of state and local authorities with emergency responsibilities) to emergency broadcast information could be seriously impaired. [Without a specific, reasonable plan to deal with such a contingency, the emergency plans do not meet 10 CFR 50.47(b)(6) as well as (b)(5).]

d) For example, neither the Carowinds Theme Park nor the Heritage U.S.A. religious retreat appear to have any notification plans or procedures. A conservative estimate of a peak summer crowd at Carowinds is 30,000 to 35,000 people.

For such a crowd to be notified and given instructions on how to leave the park in a quick, orderly, and safe manner clearly requires some set of special procedures that is yet to be formulated.

Q53. What provision is made for notifying the public of an emergency at Catawba and advising the public of actions to take?

A53. The S.C. Site-Specific Plan states "fixed and mobile sirens in the 10 mile EPZ are used for alerting the populace" (S.C. Site-Specific Plan, p. 3). "The primary means for initial verbal notification of residents in the 10 mile EPZ of Catawba Nuclear Station will be the local Emergency Broadcast Stations (EBS), while the primary means for follow-up EPI will be the SC-ETV" (York County Plan, D-7). Five primary EBS stations are listed for York County (York County Plan, D-8).

In North Carolina, fixed sirens serve as the primary public alerting system within the 10 mile EPZ in Gaston and Mecklenburg Counties. Emergency service vehicles equipped with sirens and public address (PA) systems and operated by emergency services and law enforcement personnel provide a back-up system. (N.C. Annex C, p. C-2. For additional details see N.C. Part 2, pp. 22-24; N.C. Part 3, pp. 20-23.)

EBS for the Charlotte area will be activated following sounding of the sirens. Details concerning the emergency situation and conditions and instructions or protective actions will be included in EBS messages. (N.C. Annex C, p. C-3.) The plan lists one Common Program Control Station (CPCS) and 40 other EBS stations. (N.C. Annex E.) These stations monitor the CPCS and can rebroadcast the message.

Additional information on how to respond to protective action recommendations, including in-place sheltering and evacuation, is detailed in the public information brochure which is distributed to all households in the 10 mile EPZ.

The public warning and notification system in North Carolina includes water areas on Lake Wylie and the Catawba River. Aircraft, boats with and without sirens and PA systems, and marina radios will be used to warn people on the water. The National Weather Service Radio Broadcast System, in addition to EBS, may support operations, if needed. (N.C. Annex C, p. 2.)

During the exercise in February, 1984, effective coordination of sirens and EBS messages were demonstrated in York, Gaston and Mecklenburg Counties.

Q54. Is the siren system adequate to provide early notification to the persons in the EPZ (plume) (1) generally, (2) who have hearing impairments, (3) who are inside homes with perhaps competing sounds from TV programs and record players, and (4) who are asleep, giving consideration in each case to the effects of weather conditions such as snow or excessive winds with howling or strong wind noise? Explain.

A54. Alert and notification systems have been satisfactorily operationally tested periodically. The official, engineering and acoustical testing will be accomplished utilizing guidance provided by the publication entitled FEMA 43 at some future date.

Q55. What consideration, if any, is given in the emergency plans of the State and local governments or the plans of the applicant with respect to the possibility of a power outage affecting prompt notification due to the inability because of the power outage of radio and TV stations to operate and further inability of residents to hear a message at their homes when the power at their homes is out? Explain.

A55. Plans for North and South Carolina describe mobile sirens and alerting systems that could serve in the event of a power outage. (S.C. Site-Specific Plan, p. 3; York County C-4; N.C. Annex C, p. C-2.) The North Carolina plan provides a back-up system, whereby emergency vehicles would be dispatched along preassigned routes, and stop every $\frac{1}{4}$ mile in populated areas to issue a verbal announcement. (N.C. Part 2, pp. 23-24, Part 3, p. 20.) The plan goes on to state that, "if necessary, door to door alerting will be accomplished by the back-up warning system." (N.C. Part 2, p. 22, N.C. Part 3, p. 20.)

The CPCS EBS station should continue as an effective means to transmit messages during a power outage as official EBS stations are required to have emergency generators. Persons with battery operated radios should receive the message over the radio in the event of a power outage at home.

Q56. What provisions have been made for notification of special facilities such as Carowinds Theme Park or the Heritage U.S.A. Religious Retreat? What assurance is there that the potentially large number of persons at the facilities will be properly and timely notified of an emergency at Catawba and advised as to necessary protective actions? Explain.

A56. In a conversation between Region IV staff and a Duke Power Company representative on March 19, 1984, the utility personnel stated that tone alert radios will be supplied to the Carowinds Theme Park and the Heritage U.S.A. Religious Retreat to assure early notification of events occurring which might require protective actions. Evacuation plans have been developed by owners of these facilities which discuss how notification of persons will take place and describing procedures for their evacuation. In Heritage U.S.A., security patrol officers will make house to house and building to building searches to notify persons of evacuations. The Carowinds plan details procedures for preparing for an evacuation, notifying guests, and carrying out the evacuation. (Duke Power Company transmittal of March 21, 1984, including both evacuation plans.)

Q57. Do the concerns expressed by the intervenors in this contention prevent a positive finding pursuant to NUREG-0654-FEMA-REP-1/Rev. 1? Explain.

A57. No, but a standard caveat would be included in the approval that the alert and notification system will be officially evaluated by FEMA at a future date.

Contention 11

Contention 11 provides:

The size and configuration of the northeast quadrant of plume exposure pathway emergency planning zone (Plume EPZ) surrounding the Catawba facility has not been properly determined by State and local officials in relation to local emergency response needs and capabilities, as required by 10 CFR 50.47(c)(2). The boundary of that zone reaches but does not extend past the Charlotte City limit. There is a substantial resident population in the southwest part of Charlotte near the present plume EPZ boundary. Local meteorological conditions are such that a serious accident at the Catawba facility would endanger the residents of that area and make their evacuation prudent. The likely flow of evacuees from the present plume EPZ through Charlotte access routes also indicates the need for evacuation planning for southwest Charlotte. There appear to be suitable plume EPZ boundary lines in southwest Charlotte. The boundary of the northwest quadrant of the plume EPZ should be reconsidered and extended to take account of these demographic, meteorological and access route conditions.

Q57a. Based on your review of the State and local plans, what is your conclusion regarding the adequacy of the present configuration of the northeast quadrant of the plume EPZ for Catawba?

A57a. First, the present configuration meets the "about 10 mile" requirement of 10 CFR Part 50.

Second, FEMA finds the configuration of the northeast quadrant of the plume EPZ to be sufficiently adequate to insure that the general public in this zone can be promptly notified and be able to take appropriate protective actions in a timely fashion.

Contention 14

Contention 14 provides:

See next page.

14. The Applicants have failed to demonstrate their ability to take effective actions to protect the health and safety of the general public in the event of an accident in that the evacuation time study presented by the Applicants is a piece of fiction in the guise of science and may not be relied upon for determining the ability of Applicants and public authorities effectively to evacuate residents of the Catauba EPZ in a timely manner.

By overestimating the flow of traffic on evacuation routes, the Applicants' time study overestimates actual traffic movement by a factor of between three and twelve. A flow of no more than 900 vehicles/lane/hour should be assumed, according to preliminary estimates by Dr. Sheldon C. Plotkin of the Southern California Federation of Scientists.

Traffic flows are further overestimated by failing to account for voluntary evacuation likely to take place from Charlotte via I-77. All of the study's estimates are premised only on estimates of traffic flow within the EPZ. They fail to account for backups caused by extra-EPZ congestion, especially on I-77 in Charlotte.

The Applicants' evacuation time estimates erroneously assume quick response by school buses and multiple school bus trips. School buses in South Carolina are driven by high school kids. No public official would dare to send high school kids into an evacuation zone to transport those without vehicles. Time must be allotted for finding drivers.

The Applicants' study is fundamentally useless to making a determination regarding the time within which evacuation can be accomplished in that it makes numerous assumptions regarding work and living habits which are apparently made up out of whole cloth. No references or other data bases are given for the assumptions underlying these evacuation time estimates and they cannot be credited.

The evacuation time estimates should be based only upon worst case conditions, rather than best case conditions. The Applicants' study is far too optimistic in assuming that worst case conditions will require only 156% of the time of best case conditions. The judges are asked to take notice of their own experience in Applicants' counsel trying to reach York, South Carolina, in the midst of what may be a modest snowstorm to Yankee eyes, but which had plainly immobilized the entire vicinity.

Further, Applicants' study naively fails to account for parents going first to their children's schools to pick up their children before evacuating.

Moreover, Applicants' study, by slight of hand, dismisses the major impact of the presence of large transient populations at Carowinds amusement park and Heritage USA. Those populations will take longer to evacuate than the study assumes and will co-congest I-77 with resident traffic.

The fundamental test of the adequacy of an evacuation plan is whether it can be implemented in such a fashion as to effectively avoid or minimize the radiological effects of a radiation release. Absent a real life, real time evacuation drill to test the system, any study presented in support of the evacuation drill to test the system, any study presented in support of the adequacy of the emergency plans must be technically valid from a theoretical perspective and based upon assumptions having some relationship to the real world situation to which the study is supposed to apply. This study lacks either basis.

A more realistic estimate of evacuation time for the Catawba Nuclear Station in the South Carolina Piedmont is that evacuation will require a minimum of 33 hours, assuming a conservative 600 vehicles/lane/hour vehicle travel time. Applicants are, thus, unable to provide reasonable assurance of being able to avoid or meaningfully minimize radiation exposure in the event of a radiation release at Catawba.

The Applicants thus fail to meet the requirement of NUREG 0654, Rev. 1, Appendix 4, in that their evacuation time estimates may not be credited by the Commission and fail to meet Commission requirements that it be able to demonstrate the ability of local and state authorities to take effective protective actions.

Q58. Have you reviewed the licensee's study concerning evacuation time estimates?

A58. Yes.

Q59. What did your review consist of?

A59. FEMA reviewed the Evacuation Analysis in light of State and local plans.

Q60. Do you find that the assumptions used in developing the evacuation time estimate (i.e., number of buses and bus drivers to evacuate children, adequacy of traffic control and parents coming into EPZ to pick up children) are reasonable? Explain.

A60. Based on our review of State and local plans and the "Evacuation Analysis" we find that the assumptions concerning the evacuation time estimates are reasonable.

Contention 15

Contention 15 provides:

See next page.

23. The Applicants and the local and state Plans fail to provide adequate assurance that effective protective actions can be taken because the provisions in the several plans are inadequate with regards to transportation and related evacutory activities in the event of an evacuation.

The emergency plans fail, fundamentally, to address the peculiar conditions of the areas surrounding the Catawba Nuclear Station. Large segments of these areas are rural. Some of them contain lower income communities. The time estimates used by Applicants assume that 10% of families are without vehicles. But in many of these homes, that vehicle is not home during large parts of the day. Often, those homes will have children and elderly people at home without transportation. No census of varying conditions has been done.

Moreover, the plans are premised on using school buses to transport those without their own transportation. School buses in South Carolina are driven by high school students. Even if some public official were prepared to leave emergency activities in the hands of sixteen year old youths, none would dare send such a child into an evacuation zone. No provision is made for back-up drivers. Even if the drivers can be found, in many communities those school buses are kept at the driver's home at night and not at some central motor pool.

Applicants and the local and state planning officials have failed to demonstrate that adequate transportation facilities are available to evacuate the hospitals and nursing homes in the EPZ. Nor do the plans demonstrate that adequate provisions have been made for transporting young children at day care facilities.

Numerous parents have informed members of Palmetto Alliance that in the event of an evacuation their first response will be to personally pick up their children regardless of paper plans. The state and local plans fail to address this reaction which will slow evacuation and add to confusion.

The experience at Three Mile Island demonstrates that many citizens will not leave the face of a major threat. Southerners have a special commitment to land and home which no government to date has been able to overcome. Absent a full-scale exercise which demonstrated that these hard-headed Scotch Irishmen are going to leave, no assurance can be had that the public will leave in the event of an evacuation order.

The emergency plans assume, but do not demonstrate, that adequate buses are available to move school children out in a timely manner. Multiple bus pickups may be needed.

Evacuation plans which fail to assume that human beings--and not computer modelled facsimiles thereof--are to be evacuated cannot but fail in the test. Applicants and state and local emergency planners are unable to provide assurance that the plans can be effectively implemented to protect the residents.

Q61. Do the State and local emergency plans adequately consider, with regard to transportation and related evacuation activities in the event of an evacuation, the fact that: (1) segments of the EPZ are rural, (2) some part of the population will not have personal vehicles for evacuation, (3) some households have only one vehicle which is not at home during a large part of the day, and (4) the homes have children and elderly people at home without any transportation at all? Explain for each item what provisions have been made.

A61. (1) Yes. Knowledge of population distribution is basic to the preparation of any evacuation time study. Summaries of evacuation times by sector is included in both the North and South Carolina plans as is the population in each sector (N.C. Part 1, p. 62, N.C. Operations map; S.C. Site-Specific, p. 14).

(2)(3) & (4) The Gaston County plan states that "pick up points will be established for those without transportation. These evacuees should start walking to the nearest traffic control point." (N.C., Part 2, p. 31.) For Mecklenburg County, the Charlotte Department of Transportation has the responsibility of dispatching buses to designated pick-up points. In addition, school buses may be used to transport evacuees. (N.C., Part 3, p. 33.)

The S.C. plan states that, "persons in the evacuated areas who do not have transportation, and those confined who require special transportation, will be provided means for evacuation by using all available transportation within York County and through Mutual Aid Agreements with nearby counties. State assistance will be available upon request." (S.C. Site-Specific, p. 17.)

Elsewhere, the plan reiterates, "York County will utilize all available school buses and county owned vehicles to transport any residents without transportation. Non-ambulatory residents will be transported by the Piedmont Medical Service (ambulance) and York County Rescue Services (ambulance capabilities). Residents without transportation will be transported to their predesignated shelters." (S.C., York County, Q-25.)

The Transportation Service Coordinator is to develop and maintain a transportation resources list by type and availability, develop procedures for obtaining buses and other vehicles from adjacent counties in accordance with mutual aid agreements, develop and maintain a list of drivers, and do other necessary functions to prepare for an emergency evacuation. (S.C., p. L-3.)

The Duke Power Company brochure advises individuals to call the emergency agency in their area if they are without transportation. It also urges residents to make plans now if members of the family are sometimes home without transportation.

Q62. What provision is made for transportation to evacuate the hospitals and nursing homes in the EPZ? Explain.

A62. According to the Evacuation Analysis, there are no hospitals or nursing homes in the North Carolina portion of the 10 mile EPZ (Voorhees, p. 10.) Nevertheless, the North Carolina Plan provides for the transport of non-ambulatory persons. The Gaston County Plan specifies that, "non-ambulatory patients will be transported by the county rescue squads. Mutual aid agreements with the rescue units in surrounding counties will be implemented when necessary." (N.C., Part 2, p. 31.) For Mecklenburg County, the plan states, "non-ambulatory patients will be transported by MEDIC. Mutual aid agreements with rescue units in surrounding counties will be invoked where necessary." (N.C., Part 3, p. 32.) In the York County Plan, it states, "all available resources will be used to provide transportation for non-ambulatory patients, lame and institutionalized persons and those persons who do not have private means of transportation. Vehicles of the county, public and private, and volunteer organizations will be used to the maximum extent possible. Ambulance for hospitals and nursing homes will be coordinated through the Emergency Medical Service." (S.C., York County, L-1, L-2.) Hospitals and nursing homes are to "develop plans and procedures for evacuation of hospitals and nursing homes, if required." (S.C., York County, H-5.) The two hospitals and their capacities in the 10 mile EPZ are listed (S.C., York County, H-15) but the nursing homes are not listed in the plan.

Q63 What provision is made for transportation for young children at day care centers in the EPZ? Explain.

A63. There is no discussion of transportation of children in day care centers. According to the Evacuation Analysis, while there are several day care centers in the South Carolina portion of the 10 mile EPZ, there were no day care centers in the N.C. portion of the 10 mile EPZ. (Voorhees Study, p. 10)

Q64. Do the State and local emergency plans provide for parents who will personally attempt to pick up their children at school regardless of any direction? Explain.

A64. No. State and local plans do not discuss effects of parental attempts to pick up their children at school. The public information brochures adequately describe plans for the evacuation of school children and list shelters where parents are to pick up their children.

Q65. Do the State and local plans provide for those individuals who will not leave in the face of a major threat? Explain.

A65. The plans rely on voluntary compliance of individuals with evacuation orders.

Q66. Do the State and local plans provide for the fact that multiple bus pickups may be necessary to evacuate school children in a timely manner? Explain.

A66. The North Carolina State Plan does not discuss a need for multiple pick-ups, stating, "students in public school systems will be transported on school buses and other available transportation to shelters." (N.C., Part 1, p. 58.)

The South Carolina Plan discusses the possibility of multiple bus pick-ups as follows: "The 26 public and 5 private schools located in the 10 mile EPZ will be evacuated by assigned school buses and available privately owned vehicles to their predesignated shelters. Each school has immediate access to school buses that are parked on the school grounds. Additional school buses as required will be dispatched to schools to transport the remaining school students. School teachers with their own vehicles will also transport students. No student driver will be required to drive back into the EPZ. A return trip will be made by county emergency workers or others designated by county authorities." (S.C., York County, Q-25.)

Q67. Have the State and local plans made provision for the use of transportation using school buses driven by 16 year old youths given the concern that such youths might not be sent into an evacuation zone? Explain.

A67. The plans do not discuss the use of 16 year old bus drivers.

Q68. What are the applicable standards and appropriate evaluation criteria with regard to the concerns raised by joint intervenors in this contention?

A68. NUREG-0654 provides the standards for evaluating this condition. Appropriate NUREG elements are as follows: J.8., Evacuation Analysis; J.10.b., Population distribution; and J.10.d., Mobility impaired.

Q69. Do the State and local emergency plans meet these particular mandatory standards and evaluation criteria? Explain how.

A69. N.C. has satisfied the three NUREG elements above. S.C. has satisfied all but J.10.d., and has been asked to provide further information regarding this subject. The RAC is concerned that there is no listing of "special facilities," with the number of occupants, for the mobility impaired or institutionalized, nor a listing of resources to assist in the evacuation of this segment of the population.

Contention 18

Contention 18 provides:

See next page.

18. In the event of an emergency, local telephone systems are inadequate to handle the immensely increased volume of telephone calls. Since notification of emergency personnel relies upon telephones and since those without vehicles are expected to call for a ride, major parts of the emergency communications system will be effectively knocked out. This applies especially to the notification of school bus drivers as specified in the plan.

Q70. Are the local telephone systems adequate to handle the increased volume of telephone calls during an emergency? Explain.

A70. FEMA Region IV does not have the technical knowledge to answer this question; however, we contacted the Regional Emergency Communications Coordinator (RECC) of the General Services Administration, (NCS), for assistance in answering this question. The RECC stated that the Charlotte-Rock Hill area telephone systems had electronic switching devices which should be adequate during emergencies and consequent heavy usage. He also stated that, of course, it is presumed that emergency workers would be called in advance of the general public notification of the emergency.

Q71. What are the applicable mandatory standards and appropriate evaluating criteria with respect to the concerns raised by the joint intervenors in this contention?

A71. NUREG-0654-FEMA-REP-1/Rev. 1 (Item E2) and *Planning Standard F*

Q72. Do the emergency plans meet these standards and criteria? Explain.

A72. The RAC review on March 21, 1984, of the Catawba Plans suggested five improvements in the North Carolina Plans and seven improvements in the South Carolina Plans. These improvements have been made or are scheduled to be made, and, when completed, the standards and criteria of NUREG-0654 will have been met.

John C. Heard, Jr.

Professional Qualifications

I joined the Federal Emergency Management Agency in July, 1979. I am presently assigned as the Chief of the Technological Hazards Branch in Region IV. In this position, I am responsible for the review of REP's, conducting exercises to test REP's and conducting public hearings. Members of my staff and I also assist State and local governments in preparing REP's and coordinating Federal assistance.

I served on the Regional Assistance Committee from December 1974 to December 1981. Since December 1981 I have provided staff support for and participated in all RAC activities.

From July 1973 to July 1979, I was Regional Director, Federal Preparedness Agency. The Federal Preparedness Agency was responsible for fixed nuclear facility off-site planning from December 1975 (Federal Register Notice) until made a part of the Federal Emergency Management Agency in July 1979. In December 1979, the President assigned off-site responsibility to the Federal Emergency Management Agency.

Prior to 1973, I was employed by the Office of Preparedness, Executive Office of the President. I was the representative on an ad hoc Regional Radiological Emergency Planning Committee December 1971 to August 1973. Committee was chaired by EPA and composed of representatives of Federal department/agencies, State radiological health officials, nuclear power industry representatives, and representatives of the academic community. Federal Register Notice January 1973, published by OEP assigned planning responsibilities to Regional Offices.

My formal education is as follows:

Attended the "Interagency Course in Radiological Emergency Response Planning in Support of Fixed Nuclear Facilities." Course conducted by RAC agencies at Staff College in Battle Creek, Michigan in June 1975.

Attended "Work Shop - Seminar on State Emergency Planning in Relation to Licensed Nuclear Facilities." Seminar conducted by Atomic Energy Commission in September 1972 at Oak Ridge, Tennessee.

Completed nine months course at the University of South Carolina from September 1963 to May 1964. Course was entitled "Radiation Protections Institute". Course co-sponsored by Atomic Energy Commission and South Carolina State Board of Health.

Completed Radiological Defense Officers course, Staff College, Battle Creek, Michigan, June 1962.

Conducted and served as Principal Instructor for Radiological Monitor Instructors Course, University of South Carolina July 1961.

Completed United States Department of Agriculture Radiological Monitors Course February 1961.

Assigned as South Carolina Radiological Defense Officer from January 1961 to July 1964. Was issued AEC By-Products Material License from June 1961 until departed State employment to accept Federal employment in May 1970.

While on active military duty, attended Atomic Weapons orientation course, Fort Bliss, Texas December 1958.

While on active military duty completed U.S. Army Command and Staff College (extension division), "Technical Considerations in Employment of Atomic Weapons", March-August 1958.

Thomas I. Hawkins

Professional Qualifications

My present position is Emergency Management Program Specialist for the Federal Emergency Management Agency. I am assigned to the Radiological Emergency Planning liaison position between FEMA Region IV and the States of North and South Carolina. In this position, I am responsible for the review of radiological emergency plans and preparedness for the State of North Carolina and the State of South Carolina and for the local governments within these States.

I have held the position of Emergency Management Program Specialist (or its equivalent) since December 1981. I have been employed by FEMA since July 1978.

From April 1964 to January 1977 I was employed as Planning Director of Clayton County, Georgia.

My formal education is as follows:

- AB Degree, Emory University, Atlanta, GA, 1958
- Master of City Planning Degree, Georgia Tech., Atlanta, GA, 1961
- Completed Radiological Emergency Response Course at the U.S. Department of Energy's Nevada Test Site, April 1982
- Completed Radiological Defense Officer and Radiological Defense Instructor Course, Georgia Emergency Management Agency, Atlanta, GA, March 1982
- Completed Basic Management Seminar for Emergency Management Personnel, Valdosta State College, Thomasville, GA, Winter Quarter, 1980
- Completed Radiological Emergency Planning Seminar, National Emergency Training Center, Emmitsburg, Maryland, October 1982