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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
Philadelphia Electric Company	)	Docket Nos. 50-352
	)	50-353
(Limerick Generating Station, Units 1 and 2)	)	

APPLICANT'S PROPOSED FINDINGS OF FACT
AND CONCLUSIONS OF LAW IN THE FORM
OF A PARTIAL INITIAL DECISION RELATING TO
LEA'S ONSITE EMERGENCY PLANNING CONTENTIONS

Philadelphia Electric Company, Applicant in the captioned proceeding, in accordance with 10 C.F.R. §2.754 and the Atomic Safety and Licensing Board's "Order Scheduling Proposed Findings" (April 27, 1984), hereby submits its Proposed Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision Relating to LEA's Onsite Emergency Planning Contentions.

Respectfully submitted,

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June 8, 1984

DS03

PARTIAL INITIAL DECISION

(On Onsite Emergency Planning Contentions)

OPINION

Preliminary Statement

On March 17, 1981, Applicant Philadelphia Electric Company ("Applicant" or "PECO") applied for operating licenses for the Limerick Generating Station ("Limerick). Pursuant to notice of receipt of application published in the Federal Register,[1/] Limerick Ecology Action ("LEA" or "intervenor") filed a petition for leave to intervene on September 18, 1981. At a prehearing conference held January 6-8, 1982, this Atomic Safety and Licensing Board ("Licensing Board" or "Board") found that LEA had standing to intervene and found some of its contentions admissible.[2/]

Some of the contentions proposed by LEA related to Applicant's onsite Emergency Plan ("Plan"). The Board found that such contentions should be deferred until the Plan became available. Following receipt of the Plan by the Licensing Board and parties, the Board requested LEA to reformulate and resubmit its onsite emergency planning contentions (Tr. 4825). The rephrased contentions were filed on November 14, 1983, reflecting the rulings by the Licensing Board on their admissibility at

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1/ 46 Fed. Reg. 42557 (August 21, 1981).

2/ Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), LBP-82-43A, 15 NRC 1423, 1438 (1982).

the prehearing conference on October 17-18, 1983. Because of their length, the admitted onsite emergency planning contentions are summarized rather than restated verbatim in the findings of fact. Evidentiary hearings on these contentions were held on April 23-25, 1984.

Introduction

1. Applicant's Emergency Plan ("Plan") is a two-volume document of several hundred pages which contains basic information and details as necessary to describe the philosophy, organization, facilities and equipment to ensure total preparedness for radiological emergencies ranging from anticipated minor events to hypothetical major accidents which are not expected to occur at Limerick. Applicant Ex. 32. To enable it to put its Plan into action, Applicant has adopted Emergency Plan implementing procedures. Applicant Ex. 33.[3/] Since only portions of its Plan and implementing procedures are in controversy, only those in dispute were offered and received into evidence.

2. The Applicant presented a panel of expert witnesses, well qualified by position, training and experience to explain how Applicant's Plan provides reasonable assurance that the health and safety of the public, including persons at Limerick, will be protected in the event of a radiological accident. These witnesses included senior management officials as well as Applicant's Director of Emergency Preparedness and the Senior Health Physicist at Limerick. Boyer,

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3/ For brevity and convenience, we shall discuss provisions of the Plan and implementing procedures without further reference to their exhibit numbers.

Ullrich, Kankus, Dubiel, Daebeler, Murphy, Reid and Linnemann (Statement of Professional Qualifications), ff. Tr. 9772.

3. Additionally, the Staff presented the testimony of its expert witness, a Senior Reactor Safety Engineer with the Emergency Preparedness Branch, Division of Emergency Preparedness and Engineering Response, Office of Inspection and Enforcement. The Staff's witness has had extensive training and experience in developing the more stringent emergency preparedness criteria developed by the NRC since March 1979. Sears (Professional Qualifications), ff. Tr. 9776.

4. The Board has observed the demeanor of the Applicant's and the Staff's expert witnesses on the stand and finds that their testimony is credible, reliable and probative of the issues. Accordingly, the Board has relied heavily upon this testimony. In contrast, LEA presented no witnesses and was unable, by its cross-examination, to impeach the credibility of the Applicant's witnesses or Staff's witness.

5. The matters examined during the evidentiary hearing which are not discussed in these findings of fact were considered by the Board and found either to be without merit or not to affect our decision herein. In preparing its Findings of Fact and Conclusions of Law, the Board reviewed and considered the entire record, those exhibits admitted into evidence (see Appendix B) and the Findings of Fact and Conclusions of Law proposed by the parties. Those proposed findings not incorporated directly or inferentially in this Partial Initial Decision are rejected as being unsupported by the record of the case or as being unnecessary to the rendering of this decision.

Contention VIII-1
(Spectrum of Accidents)

6. This contention asserts that the Plan does not encompass the spectrum of credible accidents for which emergency planning is required. LEA chose not to cross-examine either the Applicant's witnesses or the Staff's witness on this contention. The Board finds no merit to the contention.

7. Section 4.2 of the Plan[4/] provides representative examples of the kinds of accidents which are analyzed in Chapter 15 of the Limerick FSAR. In addition to the design basis accidents encompassed by the FSAR, revised Table 4-2 of the Plan (Applicant Ex. 34) includes events which are greater in radiological consequences than design basis accidents. For example, the events described in Table 4-2, Items IIId and IVd exceed design basis. Together, Table 4-2 and EP-101 reflect all example initiating conditions for the "General Emergency" level designation in Appendix 1, "Emergency Action Level Guidelines for Nuclear Power Plants," NUREG-0654 (Rev. 1) (November 1980). These examples include the specific example boiling water reactor ("BWR") sequences listed in Appendix 1.

8. Although no regulatory requirement exists to do so, dose calculations have been made in Table 4-1 for releases associated with design

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4/ Unless otherwise specified by reference to the Limerick Final Safety Analysis Report ("FSAR"), the Environmental Report - Operating License Stage ("EROL"), or other licensing document, all references herein are to the Limerick Emergency Plan. As noted, implementing procedures for the Plan are contained in EP-101 et seq.

basis accidents. The procedures for calculating dose consequences for accidents exceeding design basis are set forth in Section 6.2 of the Plan as discussed in the Board's findings related to Contention VIII-14, infra and are the same no matter what the severity of the accident. Boyer and Kankus, ff. Tr. 9772, at 1-2.

Contention VIII-3
(Onsite Monitoring Systems)

9. This contention asserts that the Plan does not identify and establish the onsite monitoring systems used to initiate emergency procedures. To the contrary, the Plan does identify and establish the onsite monitoring systems used to initiate emergency measures in accordance with the emergency action levels designated by NUREG-0654, Appendix 1.

10. Geophysical phenomena monitors are addressed in Section 7.3.1 of the Plan, which states that seismic instrumentation includes time-history accelerographs, peak recording accelerographs and seismic switches. Specific instrumentation used in emergency classification is provided in Appendix EP-101-2. Boyer and Kankus, ff. Tr. 9772, at 2-3.

11. Section 7.3 of the Plan provides information as to the acquisition of meteorological data. The capability of acquiring and evaluating meteorological data sufficient to meet the criteria of NUREG-0654, Appendix 2, is provided by two independently powered meteorological towers on the site and the Radiological and Meteorological Monitoring System ("RMMS"). The Limerick meteorological system has been designed in depth to provide information even if a key input parameter is unavailable. The RMMS will automatically switch to a secondary or even a tertiary sensor if a primary sensor fails. Data are available through

RMMS through a data logger in the Control Room and also through strip charts in the Control Room. In the unlikely event that all these sources of information fail, data are also retrievable from instrument shacks at the base of each tower. Boyer, et al., ff. Tr. 9772 at 3.

12. The meteorological data include 15 minute averages of wind speed and direction, sigma theta, and vertical temperature difference measurements for atmospheric stability determination. RMMS data files and calculational capabilities are available to personnel in the Control Room, Technical Support Center ("TSC") and Emergency Operations Facility ("EOF") through interactive consoles located in these facilities. Communication ports are also provided to allow for remote interrogation of meteorological parameters and effluent transport and diffusion results by the NRC and the appropriate Commonwealth emergency response agency. Boyer, et al., ff. Tr. 9772, at 3-4; Murphy, Tr. 10199. Information from the two meteorological towers provides direct input into the RMMS. The X/Q tables used in EP-316 to determine cumulative population dose utilize data from the two meteorological towers. Murphy, Tr. 10187-88.

13. The Board finds that the radiological monitors as discussed in its findings relevant to Contention VIII-14(d) are adequately addressed in the various Appendices to EP-101. For example, Appendix EP-101-6 refers to radioactive releases of the North Stack and South Stack, which would be indicated by the RMMS. Appendix EP-101-8 reflects monitors which would indicate fuel damage. Boyer, et al., ff. Tr. 9772, at 4.

14. Process and effluent radiological monitoring systems as discussed in Table 7-3 of the Plan and FSAR §11.5 are adequate. Area and airborne radiologically monitoring as discussed in FSAR §12.3.4 and

Table 7-4 are also adequate. These instruments and systems will effectively monitor radiation in plant systems and radioactive releases. Boyer, et al., ff. Tr. 9772, at 4.

15. Process monitors (non-radiological) as described in FSAR §§1.13 (describing the Emergency Response Facility Data System) and 7.5.2.5.1.1.2 (describing Applicant's compliance with Regulatory Guide 1.97) and in the various Appendices to EP-101 are also adequate. Boyer, et al., ff. Tr. 9772, at 4. Applicant's procedures provide for the initiation of emergency action levels upon certain water level monitor readings, along with other variables in the plant, particularly failure of emergency core cooling system equipment. The instrumentation to be used at Limerick, including the inadequate core cooling instrumentation desired by the BWR Owners Group, meets the requirements of Regulatory Guide 1.97. Ullrich, Tr. 10196-97.

16. An airplane crash or railroad accident in the area of the plant would alert the personnel to be aware of symptoms of toxic chemicals, either by detecting an odor or physical effects. Even if there were no observed event in the area, the detection of strange odors or the physical effects on employees would be the basis for declaring at least an unusual event. Boyer, Tr. 10183-84. Under FSAR Section 2.2.3, Applicant has established monitoring systems for those toxic chemicals most likely to affect the plant site. Boyer, Tr. 10183; Applicant Ex. 38. The toxic chemicals which Applicant will monitor were chosen by a survey of area manufacturers and users. Applicant will monitor for all chemicals which have the capability to incapacitate operators in the Control Room. Boyer, Tr. 10207.

Contention VIII-6(a)
(Mutually Agreeable Bases for Notification of Offsite Organizations)

17. This contention asserts that the Plan does not demonstrate that the bases established for the Applicant's notification of response organizations with responsibility for onsite augmentation are mutually agreeable. The only organizations with responsibility for onsite augmentation of a function performed by Applicant under its Plan are the Linfield and Limerick Fire Companies. Letters of agreement with each of these organizations have been obtained, which state that each will provide firefighting support for the Limerick plant at the request of Applicant "upon dispatch by the Montgomery County Division of Public Safety, Office of Communications." The Office of Communications is aware of these agreements and understands tnat each company agrees to respond whenever called. Boyer and Kankus, ff. Tr. 9772, at 5; Kankus, Tr. 10007-08; Applicant Ex. 44 and 45.

Contention VIII-6(c)
(Notification of Emergency Organizations)

18. This contention asserts that Applicant has not shown that it will notify offsite emergency organizations within about 15 minutes after classifying an emergency event. Section 6.1 of the Plan governs the activation of offsite emergency response organizations and provides that activation would occur within 15 minutes of the classification of the event. Boyer and Kankus, ff. Tr. 9772, at 5-6.

19. Under Limerick procedures, notification to offsite authorities is given at the early stages of an emergency. Kankus, Tr. 10088. Applicant's procedures permit operators to provide prompt notification to offsite authorities immediately upon classifying or reclassifying an

event at one of the various emergency action levels. Kankus, Tr. 10082. The Control Room operators have many channels of available information which are directly applicable to the events described in EP-101 for declaring those levels. Once the operator knows that the event has exceeded the threshold of an event in EP-101, he will advise the Shift Supervisor in the Control Room, who will then classify the event and hand the shift clerk a prepared notification message per EP-102 through EP-105, who in turn notifies the appropriate offsite authorities according to his call list. Ullrich, Tr. 10083, 10098. The capacity exists for simultaneous phone calls to the offsite agencies. Ullrich and Kankus, Tr. 10098, as corrected at 10214.

20. In the most likely scenario of the postulated unavailability of the Standby Liquid Control System, for example, the operator would have declared an alert prior to the site emergency declaration required by that event. The alert level is reached when a reactor scram fails to bring the reactor to a subcritical level. Kankus, Tr. 10087-88. In this particular scenario, the reactor operators would know within a minute that the control rods had not inserted and that the neutron level was not decreasing. Boyer, Tr. 10088.

21. Similarly, in a scenario postulating radioactive releases, the technical specification limit release value would be noted on the scale of the instrument of interest and would be alarmed prior to reaching that level. Therefore, the Control Room operator would know immediately that the technical specification level had been reached and would declare an unusual event. Ullrich, Tr. 10089. Dose projections would be made using the RMMS whenever an airborne release exceeds technical

specification limits. This takes less than five minutes. Murphy, Tr. 10090-91.

22. Verification of an offsite toxic chemical release would be made by operators outside the Control Room. If the release were to affect the Control Room ventilation systems, an alarm would be sounded. If the release occurred as a result of an accident onsite, Applicant's personnel could personally verify the content of the railroad cars. In addition, Conrail would be notified. Ullrich and Boyer, Tr. 10099, 10100.

23. In the event of a site evacuation, security personnel would require less than five minutes to be in place. Ullrich, Tr. 10103. This includes having the Personnel Safety Team leader direct team members to exit points. Dubiel, Tr. 10104. Other procedures being performed by the Interim Personnel Safety Team leader would not take priority over site evacuation. In a fast-developing scenario, the direction to give priority to evacuating site personnel would take only a few seconds. Dubiel, Tr. 10106. Specifically, the Personnel Safety Team leader would assign and instruct individuals to perform the functions designated in EP-254 for site evacuation as a priority item. Dubiel, Tr. 10107.

24. The Personnel Safety Team leader is not the individual who would announce a site evacuation under EP-305. Section 9.1.1.7 of EP-305 refers to the responsibility of the Emergency Director or Interim Emergency Director to make this announcement when advised by the Personnel Safety Team leader that individuals have been dispatched in support of the site evacuation. Moreover, the steps performed by the Personnel Safety Team leader under EP-305 and the procedures related to

declaration of a site emergency or general emergency need not necessarily be performed in sequence. Thus, Applicant's procedures for activating its Personnel Safety Team fully support procedures for site evacuation and would not delay any necessary notification of offsite authorities. Dubiel, Tr. 10109; Ullrich, Tr. 10110; Kankus, Tr. 10111.

25. The process of notifying offsite authorities of an emergency action level is a wholly separate function apart from site evacuation. Declaration of an appropriate emergency action level is initiated by indications in the Control Room and information available to the operator. Site evacuation is a different procedure based on other criteria, such as airborne radiation levels in the plant and releases offsite. Different groups of site personnel are involved in these two activities. The Shift Superintendent, Control Room operators and shift clerk would be involved in the classification of an emergency and notifying offsite authorities. The Emergency Director and other team members would receive information from radiation protection personnel in the plant, Control Room operators and, by way of the Personnel Safety Team, would initiate a site evacuation. The two functions do not necessarily occur simultaneously, but could be handled simultaneously if so required. Ullrich, Tr. 10121-22, 10124-25.

Contention VIII-7(c)(3)
(Minimum Staffing Requirements)

26. This contention asserts that Applicant's staffing provisions do not meet the 30 and 60 minute augmentation of minimum staffing requirements. Applicant's compliance with the minimum staffing requirements stated in NUREG-0654, Table B-1, is reflected in Table I-1 of its Plan. Table I-1 states the major functional area and major task of necessary

personnel with a description of position, title or expertise, and compares this information with the requirements under NUREG-0654 for minimum shift personnel and augmenting personnel to be added within 30 and 60 minutes, respectively. Applicant's plans for augmenting onsite personnel fully meet the requirements of NUREG-0654. Boyer, et al., ff. Tr. 9772, at 6.

27. Applicant has surveyed the present plant personnel for travel time from home to Limerick. Kankus, Tr. 10126. Additional staff will be added throughout the operational lifetime of the plant. Kankus, Tr. 10127. The survey included all of the positions in Table B-1 of NUREG-0654. Applicant's survey was conducted by the Site Emergency Planning Coordinator, who contacted various plant personnel assigned to these positions, asked their travel time between home and the plant, received written responses, reviewed the responses for accuracy and compiled a table with the information. Kankus, Tr. 10126-28, 10167; Applicant Ex. 46. The reviewer knew the home addresses of each of the respondents. Kankus, Tr. 10169. In each instance, it was determined that personnel assigned can meet the 30 or 60 minute augmentation requirement for the positions designated in Table B-1. Kankus, Tr. 10128; Applicant Ex. 46.

28. Although LEA attempted to establish that Applicant's implementing procedures would require the availability of a number of health physics personnel in addition to those required under Table B-1 (Tr. 10134-47), Applicant's survey of plant personnel travel times indicates that seven health physics personnel would be able to report to the plant within 30 minutes, and an additional nine within an hour of notification. Give the health physics staff on board as anticipated, more than

30 would report altogether. The total number of health physics personnel available within these periods provides Applicant with reasonable assurance that it will be able to carry out each of the health physics functions for the various onsite emergency groups as required. Dubiel, Tr. 10148-50.

29. Applicant's implementing procedures are developed to encompass the full spectrum of accidents and to include the actions that will be taken for several days following an emergency, as necessary. Not all procedures must be implemented in the early hours of an emergency. For example, a site evacuation would be required only when nonessential personnel are at the site. At such time, additional health physics personnel would already be onsite. Further, in the early stages of an emergency, certain operations, such as search and rescue or first aid, would take priority over other operations, and health physics technicians would be assigned on the basis of those priorities. Dubiel, Tr. 10149-50. As regards augmentation of site personnel, there is no distinction between the health physics technicians provided by Applied Radiological Control and employees of Applicant in working at and reporting to the Limerick site. Dubiel, Tr. 10166-67.

30. The Staff considers the 30 and 60 minute augmentation periods under Table B-1 of NUREG-0654 to be goals rather than regulatory requirements. The Staff customarily permits leeway in compliance with the objectives of Table B-1, depending upon plant location. Sears, Tr. 10155. Even if Table B-1 were considered a requirement, the Staff would still find that Applicant has met the 30 and 60 minute augmentation levels. Sears, Tr. 10156.

Contention VIII-8(b)
(Adequacy of Emergency Facilities,
Equipment and Supplies)

31. This contention asserts that the Plan fails to demonstrate that adequate emergency facilities and equipment are provided and maintained. Sections 7.1.2, 7.1.3 and 7.1.4 of the Plan adequately describe the Emergency Operations Facility ("EOF"), Technical Support Center ("TSC"), and Operations Support Center ("OSC"), including the physical layout, equipment, documents and supplies necessary for the efficient and reliable operation of these facilities. When fully functional, these facilities will meet the requirements of of NUREG-0737, Supp. 1. Boyer and Kankus, ff. Tr. 9772, at 6-7.

32. Reliability of the equipment, instrumentation and data systems contained in the TSC is not a requirement under NUREG-0737, only a criterion for evaluation. Nonetheless, the Staff will assess compliance with the unavailability goal of .01 in NUREG-0696. If, in its judgment, any equipment is unreliable, the Staff will advise the licensee to obtain other equipment. Sears, Tr. 10065-69.

33. Equipment instrumentation and data systems for the TSC will meet the operational unavailability goal of NUREG-0696 because the purchased equipment has been specified to have a reliability of .99. Boyer, Tr. 10074-75. In addition to design specifications to the vendor, onsite training for the computer equipment will assist in meeting the unavailability objective of .01. For example, with respect to the Radiological and Meteorological Monitoring System ("RMMS"), an interrelated system of manual backup calculations, data communications, telecommunications paths between the TSC, Control Room and EOF as well

as other communication systems all serve to achieve the unavailability goal of .01. Boyer and Murphy, Tr. 10075, 10077-78.

34. Reliability information is available to Applicant on the basis of its interactions with the contractor and vendors. Murphy, Tr. 10077. It is contained in technical literature provided by the vendor based on feedback from users on their operational experience for particular systems over extended periods. Such information is inherently reliable because users rely upon the vendor for support with spare parts and expertise in maintenance and repair during down time. Murphy, Tr. 10078-80.

Contention VIII-10(a)
(Access to the Site)

35. Although broadly contending that Applicant's agreements with local support organizations do not delineate the authorities, responsibilities and limits on their actions, LEA focused upon access procedures for offsite fire companies and ambulance services and the performance of firefighting functions onsite. In the event that an offsite fire company were summoned to the Limerick site, the fire truck would be met at the gate by security personnel, who would provide dosimetry and escort the truck to the appropriate location on site. Limerick and Linfield Fire Companies will not have authority onsite in deciding how to fight a fire. Kankus, Tr. 9968-69.

36. An escort will accompany fire department personnel at all times while onsite. Once onsite, the fire department would be under the direction and control of Applicant's Firefighting Group Leader. The Shift Supervisor will assume the role of Firefighting Group Leader and direct firefighting efforts to control fire and other related incidents.

Two shift supervisors are onsite at all times. Under applicable procedures, one shift supervisor will act as the Firefighting Group Leader and, if the Shift Superintendent is unavailable, the other will act as Interim Emergency Director in the event of an radiological emergency. Applicant's personnel will thereby retain responsibility for the direction and control of offsite fire companies. Boyer, et al., ff. Tr. 9772, at 7-8; Kankus and Ullrich, Tr. 9971-73.

37. Ambulances which provide transportation services to offsite medical facilities are governed by the same access control procedures. Security personnel will control ambulance access to the site, provide dosimetry to its drivers, escort the ambulance onsite where needed, direct the ambulance to appropriate areas to pick up victims and prevent the ambulance from going into areas where access is not required. As regards helicopter transporting services, the helicopter would be directed to land outside the restricted area of the plant to pick up any patients. Boyer, et al., ff. Tr. 9772, at 10; Kankus, Tr. 9967.

38. The security personnel who escort offsite fire companies and ambulances when onsite are responsible only for access control. They are not responsible for any type of activities related to the function of the offsite personnel they escort. Kankus, Tr. 9973-74.

39. Agreements with local physicians have been reached as reflected in Appendix A of the Plan to render onsite and offsite medical assistance. The physicians under these agreements would be bound by the same access control provisions. Boyer, et al., ff. Tr. 9772, at 11-12.

Contention VIII-11
(Offsite Augmentation of
Firefighting Capabilities)

40. This contention asserts that additional agreements with other local fire companies are necessary to provide adequate fire protection at Limerick. The plant is designed such that it is basically self-sufficient in firefighting capabilities. The facility has a minimal combustible loading in safety-related areas. Thick 2- to 3-foot reinforced concrete walls, in and of themselves, are a significant passive fire barrier. Reid and Kankus, Tr. 9983.

41. Pursuant to NRC Staff Branch Technical Position CMEB-9.5.1, Applicant has fully analyzed both active and passive measures necessary for fire protection. This analysis considered fire detection capability, automatic and manual suppression capability, physical separation of potentially affected components, effects of structural barriers on limitation of fire damage, and the necessary administrative controls and personnel requirements, including training, for fire prevention and manual fire suppression activities. The results of this analysis are contained in Applicant's Fire Protection Evaluation Report, which demonstrates that Applicant's onsite fire detection and suppression capabilities, in concert with safety system and structural configuration, are adequate to suppress any credible fire at Limerick or, even if the fire is allowed to burn out, to limit fire damage to structures, systems, or components important to safety so that the capability to safely shut down the plant is ensured. Boyer, et al., ff. Tr. 9772, at 12; Reid, Tr. 9983.

42. Onsite firefighting personnel are trained by supervisory site personnel and at a special school for training in plant firefighting techniques. Kankus and Reid, Tr. 9970-71; Ullrich, 10008-09.

43. While offsite fire companies utilize professional firefighters who know how to use their equipment, they are not familiar with the layout of the Limerick plant, the electrical feeds and ventilation systems in any given area or the other site specific features important to extinguishing the fire. By comparison, predetermined firefighting plans based on specific plant features are available to the Firefighting Group Leader. Because of the Firefighting Group's expertise and advanced planning, firefighters arriving onsite would be willing to work at its direction. Ullrich, Tr. 10012-13.

44. By letters of agreement, the Linfield and Limerick Fire Companies have agreed to provide firefighting assistance to Limerick upon request. Linfield and Limerick Fire Company equipment is purchased to National Fire Protection Association standards. Boyer, et al., ff. Tr. 9772, at 13; Applicant's Ex. 44 and 45.

45. Dispatch data available to the Chief of the Linfield Fire Company indicates that of the 86 times the Linfield Fire Company was called out last year, only once was it unavailable. Applicant has never had a need for offsite firefighting support at any of its nuclear stations. Based on this operational experience, it was determined that the back-up provided by these companies is sufficient. Boyer, et al., ff. Tr. 9772, at 13; Reid, Tr. 9978; Ullrich, Tr. 10009.

Contention VIII-12(a)
(Adequacy of Medical Services for
Contaminated, Injured Individuals Onsite

46. This contention asserts that the medical services and facilities described in the Plan are inadequate for the potential number of contaminated, injured individuals for whom planning is required. Applicant's planning for Limerick with regard to the provision of medical services and facilities to provide treatment for contaminated, injured persons has been undertaken in light of the guidance provided in Southern California Edison Company (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-83-10, 17 NRC 528 (1983). Further, Applicant has the benefit of the experience of its consultant/contractor Radiation Management Corporation ("RMC"), which has obtained such services for a number of other nuclear power plants. Boyer, et al., ff. Tr. 9772, at 13-14.

47. PECO has an agreement with RMC for medical services from the Hospital of the University of Pennsylvania ("HUP"). Linnemann, Tr. 9801; Applicant Ex. 42. Additionally, Applicant has an agreement with the Pottstown Memorial Medical Center ("Pottstown Memorial"). Linnemann, Tr. 9801; Applicant Ex. 43. Together, Pottstown Memorial and HUP will provide all the offsite medical support necessary for the treatment of contaminated, injured patients transported from the Limerick site. Boyer, et al., ff. Tr. 9772, at 8, 14; Applicant Ex. 42 and 43.

48. HUP has entered a general agreement with RMC for the treatment of such patients on behalf of other nuclear power plants with which RMC has separate agreements, e.g., Susquehanna Steam Electric Station, Salem Nuclear Generating Station and Calvert Cliffs Nuclear Power Plant.

Limerick has been added to this umbrella agreement. Boyer, et al., ff. Tr. 9772, at 9-10; Applicant Ex. 40.

49. Under the agreement between Applicant and Pottstown Memorial, Pottstown Memorial will provide the primary medical care if treatment of contaminated, injured victim(s) is necessary. Linnemann, Tr. 9801. Pottstown Memorial is approximately two miles from the Limerick plant. From a medical point of view, the supporting hospital's proximity to a nuclear power plant site is optimum because the primary concern is the serious traumatic injury or serious illness. Boyer, et al., ff. Tr. 9772, at 8; Linnemann, Tr. 9905-06; Applicant Ex. 43.

50. It is anticipated that Pottstown Memorial will be able to handle a number of contaminated, injured victims utilizing its routinely available facilities and resources. In the event that larger numbers must be treated, Pottstown Memorial will initiate its disaster plan for expanding such capabilities as it would in the event of any non-radiological emergency. In initiating these procedures, Pottstown Memorial will utilize a radiation plan developed by RMC for hospitals generally, which will be adapted to the specific facilities and staffing for Pottstown Memorial. Many of the procedures for handling radiation injuries under the Pottstown Memorial plan will be similar to those under the HUP plan. Boyer, et al., ff. Tr. 9772, at 8-9, 14; Linnemann, Tr. 9928; Applicant Ex. 40

51. Essentially, Pottstown Memorial Emergency Room staff would institute triage principles based upon injury. Triaging is a normal and acceptable procedures for disaster planning because medical planning in general attempts to adapt itself to the more usual occurrences. Less seriously injured/contaminated patients will be held in ambulances.

Seriously injured/contaminated patients will be processed through the Radiation Emergency Area ("REA") sequentially according to necessity for life-saving measures. The REA can be expanded accordingly. Boyer, et al., ff. Tr. 9772, at 9; Linnemann, Tr. 9815-16, 9866-67.

52. Radiation injuries would not present a difficult disaster problem for a hospital because such injuries by their nature do not occur for days or weeks later and could be quite readily triaged and treated without undue pressure on the hospital. There are very few circumstances in which radiation injuries require prompt treatment, and then only in instances of exceedingly high dosages on the order of at least 1,000 rads. For a lesser dose, there is no particular treatment in the first week of the onset of radiation symptoms that would increase the survival rate of the victim; isolation of the patient would be the primary treatment indicated at that time. Linnemann, Tr. 9807-09.

53. Based upon the experience to date with severe radiation injuries that have required hospitalization and aggressive hemotological care, radiation injury is very predictable. In instances of severe exposure, patients will recover unless they get super lethal doses. The guiding medical philosophy in such cases is to avoid overtreatment and generally provide support for the patient, allowing a natural recovery. Once the dose is known, doctors can readily predict the course of illness over the next five weeks, enabling the doctor to know what to monitor and what actions to take or not to take. Linnemann, Tr. 9909-10.

54. In considering radiation injuries, the number of potential victims is unimportant. The manner in which a hospital responds to a number of casualties which could be classified as a mass casualty or

disaster situation is a function of the trauma sustained rather than any contamination or radiation injury. All hospitals have disaster plans should they be faced with a large, unspecified number of injured patients. The plan put into effect would therefore handle whatever number of patients were received. Linnemann, Tr. 9805.

55. Normally, a hospital disaster plan merely needs an addition to enable it to handle contaminated, injured patients. Therefore, amendment of the existing Pottstown Memorial disaster plan to account for injured patients who are also contaminated is strictly secondary. Essentially, the Radiation Plan developed by RMC for HUP will be modified to relate to the physical character and staffing of Pottstown Memorial. The procedures being developed by RMC for Pottstown Memorial are based upon its similar experience with other hospitals in providing such procedures, which have previously been found acceptable by the hospitals. The Pottstown Memorial disaster plan would apply to Limerick as it would to any other industrial facility in the area. Boyer, et al., ff. Tr. 9772, at 8-9, 14; Linnemann, Tr. 9812-14.

56. The Pottstown Memorial disaster plan will be amended to provide for contaminated, injured persons as follows: (1) selection of a hospital area as a radiation emergency area where contaminated and injured patients are sorted and treated; (2) control of contamination to this area; (3) consultation and dose evaluation for the patient's initial exposure once the patient has been stabilized; (4) administrative procedures, such as holding ambulances at the hospital until they have been properly monitored for contamination. Linnemann, Tr. 9814-15.

57. There are several categories of special equipment and supplies necessary for Pottstown Memorial to treat contaminated, injured patients

under its agreement: (1) radiation instrumentation to detect and control contamination; (2) special bath arrangements so the patient can be decontaminated while the decontaminated water is collected; (3) decontamination supplies; (4) the means to determine the patient's dose. Such equipment and supplies will be available at Pottstown Memorial, or will be provided by Applicant as needed. Linnemann, Tr. 9816, 9818; Boyer, Tr. 9819-20.

58. Because a whole body counter is a very intricate piece of equipment and difficult to maintain, this instrumentation is maintained by RMC in a Philadelphia mobile for use at a number of hospitals in the area. It can thereby easily serve a geographical area of 1,000 miles. Linnemann, Tr. 9820-21, 9904-05.

59. Training of Pottstown Memorial personnel to implement its radiological plan and procedures will be conducted semi-annually. The basic training materials are those used by RMC at many other hospitals throughout the country. In general, the training will cover designation of a Radiation Emergency Area, proper control procedures, proper sampling and survey of contaminated patients and the decontamination of these patients, classification of radiation injuries, and removal and storage of contaminated articles. Linnemann, Tr. 9828-29, 9947-48.

60. Pottstown Memorial staff will be trained in the biological effects of ionizing radiation, including risk estimates, the classification of acute radiation injuries, the course of such injuries, and their initial and Emergency Room treatment. Linnemann, Tr. 9830, 9947-48. It is not crucial for other than Emergency Room personnel to receive formal training in the treatment of contaminated, injured patients because their chief function will be to treat injuries. There

will be hospital x-ray technicians and radiation technicians from the plant to control the radiation for them and provide guidance. Linnemann, Tr. 9868-69.

61. Different RMC teams composed of a physician, a registered nurse and a nuclear medicine technician will conduct the training of Pottstown Memorial staff at the hospital. Training is provided for emergency room physicians, emergency room nurses, maintenance personnel responsible for setting up the control area, and security personnel responsible for securing the area. Training will be directed chiefly to the Emergency Room staff, but will be available to all hospital staff. Three training sessions of two days each and three drills, plus a field exercise, are provided. Semiannual training sessions are provided thereafter. The drills of the Pottstown Memorial staff on procedures involving treatment of radiologically contaminated patients will be included as part of the FEMA and NRC joint exercise. Linnemann, Tr. 9830-31, 9867, 9901-04, 9954. Additionally, two or three training sessions and drills would be personally evaluated by an RMC physician. These drills will be held prior to the first joint exercise. Linnemann, Tr. 9955.

62. If, for any reason, treatment of a contaminated, injured victim requires a medical specialty not immediately available at Pottstown Memorial, the patient would be stabilized and transported to HUP, which has greater capabilities for particular medical specialties as well as clinical capability and experience to evaluate and treat severe exposure cases. Boyer, et al., ff. Tr. 9772, at 9. There will be ample time to coordinate with HUP to arrange for transportation of a patient from Pottstown Memorial for definitive evaluation and treatment once the

patient has been resuscitated, stabilized and decontaminated. Linnemann, Tr. 9870, 9958-59.

63. The RMC agreement with HUP as regards "radiation injury" includes contaminated, injured individuals as well as individuals injured by radiation. A person contaminated by radiation is not necessarily a victim of radiation injury. Linnemann, Tr. 9802-05.

64. Arrangements for transportation to the HUP will be coordinated through Pottstown Memorial. Such transportation to be in the best interests of the patient (ambulance, private vehicle or helicopter). Boyer, et al., ff. Tr. 9772, at 9.

65. Broad experience at numerous nuclear power plant sites over the past many years has demonstrated that no more than two contaminated, injured patients at any one time have had to be taken to a local hospital. Injuries in that order of magnitude should be expected in the future. A core melt accident would not necessarily generate higher numbers of trauma casualties, which, rather than radiation injury per se, would be of concern in planning for offsite medical assistance. Linnemann, Tr. 9806-07.

66. Based upon the experience of RMC, which has 15 years experience with the nuclear industry arranging for hospitals to accept contaminated patients and establishing an emergency medical program, it was determined that Pottstown Memorial could, as a conservative judgment, provide adequate medical services for contaminated, injured personnel from Limerick. For the 25 nuclear sites for which RMC maintains its program, there have been only 31 instances over the past 15 years in which a contaminated, injured person has been transported to a hospital. This averages to only two per year, i.e., one incident per plant every

five, six or seven years. In each case, the patient's contamination was only at the nuisance level. Linnemann, Tr. 9915-16.

67. Although the Board considered the unavailability of Pottstown Memorial in the event of a very serious accident at Limerick, it is difficult to postulate a radiological situation in which a hospital would be totally closed and unable to receive patients who require life-saving measures. In any event, if a hospital were closed, for whatever reason, existing contingency plans would be implemented or the hospital would adapt to the situation by shuttling patients to the nearest hospital, depending on their condition. There are a number of choices in the area of the Limerick plant, including hospitals in Phoenixville, Reading and Norristown, which are approximately 8 to 10 miles from the site. Linnemann, Tr. 9906, 9911; Boyer, Tr. 9911.

68. The situation as regards a possible radiological emergency is indistinguishable from any other kind of circumstance (e.g., an earthquake) in which a severe trauma victim would be transported from one hospital to another. Thus, planning provides for the possibility that Pottstown Memorial may be evacuated as part of a general evacuation of the plume exposure pathway EPZ. Boyer, et al., Tr. 9772, at 14; Linnemann, Tr. 9841-42, 9906, 9911; Boyer, Tr. 9911.

69. Limerick's primary arrangements for medical services at Pottstown Memorial with backup at HUP is similar to those at many other nuclear plant sites in the country. The foremost consideration is that there be means to take care of a traumatic injury as quickly as possible. The probability that a hospital within the 10-mile plume exposure EPZ might have to be evacuated is vanishingly small and does not justify use of another hospital beyond the EPZ when considering the far greater

risk of ordinary industrial accidents at nuclear power plants. The NRC Staff has not required an applicant in other cases to make preliminary arrangements for further backup support from additional hospitals. Sears, Tr. 9929-31.

70. It is extremely improbable that a hospital would be evacuated because of an accident at Limerick since a release from a nuclear power plant would not be life threatening and hospital evacuation would be justified only by an immediate life threatening situation. In any event, all hospitals evacuate for a number of reasons (chlorine gas, earthquakes, fires) under contingency plans, which would include the handling of contaminated patients. If a hospital is evacuating, it would not receive patients. Patients would be transferred to other hospitals. Linnemann, Tr. 9941, 9944.

71. The Joint Committee on Hospital Accreditation requires all hospitals to have some plans for handling contaminated and injured patients. All of the hospitals in the area of the Limerick plant are accredited. Accordingly, other hospitals in the vicinity of the Limerick plant could be utilized in an emergency situation on an ad hoc basis to receive contaminated, injured patients, even if Pottstown Memorial were unavailable. Linnemann, Tr. 9912-14; Sears, Tr. 9931.

72. The accreditation process reviews each hospital's plans for adequacy of handling any type of contaminated, injured patients, regardless of the contamination's origin. Although isotopes from contamination from a nuclear power plant accident may differ from other forms of accidental exposure, the process of decontamination is the same. Linnemann, Tr. 9950-51.

73. HUP is about 45 minutes driving time from the Limerick site. In the case of a life-threatening injury, however, the patient would be transported to the nearest available hospital, even assuming the unavailability of Pottstown Memorial. As discussed in paragraph 67, supra, the lack of any prior agreement or specialized procedures for the treatment of contaminated, injured patients would not preclude the acceptance by another hospital of a patient requiring immediate care. Linnemann, Tr. 9844-45.

74. RMC's agreement with HUP to provide a radiological emergency medical team to attend the patient is not a matter of actual medical first-aid treatment, but rather assistance in the area of radiobiological and radiation dose evaluation. Linnemann, Tr. 9946.

75. Decontamination procedures at HUP and as planned for Pottstown Memorial enable the Emergency Room personnel to take care of emergencies, of whatever nature, and thereby resuscitate, stabilize and otherwise treat the patient while working in a contaminated area. Even in the presence of higher levels of contamination than yet experienced, hospital staffs would be able to resuscitate and stabilize the patient. Linnemann, Tr. 9920-22. Removal of a contaminated patient's clothing, which accounts for about 90 percent of the contamination, could be performed while life-saving measures were being performed. Linnemann, Tr. 9922.

76. In most situations, it would be desirable to transport the contaminated, injured patient directly to the hospital before examination by a doctor. The First-Aid Team, which is medically trained to offer first-aid under the Red Cross multi-media first-aid program, would decide whether to immediately transport the patient to a hospital

or keep the patient at the site. Arrangements exist, however, to cover the contingency in which an injured person cannot be moved promptly and where it may be desirable for the physician to render immediate first-aid or other medical treatment while transportation is being arranged. Linnemann and Boyer, Tr. 9927; Dubiel and Kankus, Tr. 9940.

77. The Personnel Safety Team Leader has responsibility for dispatching and controlling the actions of the First-Aid Team and is responsible for notification of the ambulance. He may do it himself or delegate that authority under EP-252, Section 9.1.1.4. Dubiel, Tr. 9962-63.

Contention VIII-12(b)
(Adequacy of Transportation for
Contaminated, Injured Individuals)

78. This contention asserts that the Plan does not demonstrate adequate arrangements for the transportation of contaminated, injured individuals to offsite medical facilities. Applicant has arranged for the availability of ambulances from the Goodwill Ambulance Unit by a letter of agreement, by which Goodwill will respond to a call for assistance at Limerick and provide necessary transportation services to hospitals. Each of the five ambulances available from Goodwill has a capacity for transporting two patients. A letter of agreement with another ambulance service is also being obtained to provide a back-up capability. Boyer, et al., ff. Tr. 9772, at 10; Kankus, Tr. 9846-47, 9873.

79. For the local communities served by Goodwill, there are backup services available at the county level. If Goodwill were requested to respond to a serious injury at Limerick, Applicant would expect its call to take priority over another request, which would be assigned to one of

the backup ambulances at the county level. Boyer, Tr. 9848-49. All ambulance companies work together and they take priorities as they exist, no matter where they occur. Sufficient interconnection among county ambulance services exists such that an adequate response can be made to cover each contingency. This poses no particular problem because one of the calls may involve a nuclear power plant. Linnemann, Tr. 9849, 9874-75. If Goodwill ambulances were occupied, the Goodwill dispatcher would notify the county immediately and arrange for another ambulance to be dispatched for Limerick. Boyer, Tr. 9937. If necessary, more than two patients could be transported by an ambulance. Boyer, et al., ff. Tr. 9772, at 11.

80. It would be highly unusual that there would be no ambulance available in the area of the Limerick plant to transport an injured person such that the use of the Keystone helicopter would be required. Linnemann, Tr. 9860. If such a situation did occur, some other vehicle onsite would be able to transport the patient to a hospital if that were the recommended medical course of action to follow. Linnemann and Boyer, Tr. 9860. Choice of the transporting vehicle depends on the patient's condition and the availability of the various modes of transportation. The means selected is that which meets the patient's condition best at the time. Linnemann, Tr. 9861.

81. Transportation to a hospital could be made by Keystone and coordinated through RMC under the terms of their letter of agreement. Boyer, et al., ff. Tr. 9772, at 11; Linnemann, Tr. 9851; Applicant Ex. 41.

82. The helicopter service would be used primarily to transport stabilized patients who are determined to be movable from one hospital

to another. Linnemann, Tr. 9855. If necessary, however, a helicopter could transport a trauma victim from Limerick to a hospital. Linnemann, Tr. 9855-56. The Keystone contract provides that Keystone picks up an RMC medical assistance team for transport to the Limerick site or the receiving hospital. This would not, however, interfere with the transport of the patient to the hospital. Linnemann, Tr. 9858-60. The transport by Keystone of the RMC medical team is not a time critical function. The team's job begins only after the patient has been stabilized and may be evaluated for radiation exposure and contamination, which is a secondary concern to serious injury or illness. Linnemann, Tr. 9861.

83. Keystone has a number of aircraft which may be made available to its clientele. Its contract with RMC provides for the availability of a six-passenger Bell long-range helicopter or a five-passenger, fixed-wing aircraft. Linnemann, Tr. 9853; Applicant Exh. 41. In an emergency, Keystone would make as many aircraft available as possible. Linnemann, Tr. 9853. Additionally, through past arrangements between Applicant and Keystone, Keystone would assist in suggesting other available aircraft services. Boyer, Tr. 9854.

84. The Keystone helicopter could be used to transport a patient to HUP. If a Keystone fixed-wing aircraft were used, it would land at Philadelphia airport, which is 15 minutes driving time from HUP. Linnemann, Tr. 9853-54.

85. Private vehicles onsite provide an additional capability for transporting contaminated, injured victims. For less severe injuries (e.g., broken arm), such patients need not be transported by ambulance

and could be easily conveyed by automobile. Boyer, et al., ff. Tr. 9772, at 11.

86. A contaminated injured person at the site will be totally decontaminated if possible prior to transportation offsite to a medical facility, consistent with the need for prompt medical attention. Boyer, et al., ff. Tr. 9772, at 15; Linnemann, Tr. 9923. Dosimetry for ambulance personnel will be issued at the time the ambulance arrives at Limerick, collected upon leaving the site or at the hospital, and then analyzed. Dubiel, Tr. 10262. Adequate radiological protection is provided by anti-contamination clothing worn by the driver and plastic wrapping which shields the patient and surfaces of the ambulance. Decontamination of ambulance attendants, if necessary, would ordinarily be accomplished at the accepting medical facility by normal washing and removal of clothing. Only if decontamination facilities at the hospital were in use for a patient would such personnel be transported back to the Limerick site for decontamination. Boyer, et al., ff. Tr. 9772, at 15; Dubiel, Tr. 9924, 9926; Linnemann, Tr. 9924.

87. Ambulance driver decontamination is primarily a matter of personal hygiene. There is no concern regarding irradiation of because the skin is very resistant to radiation. Skin damage could only result from visible contamination radioactive dirt left on the skin for hours. Linnemann, Tr. 9924-25.

Contention VIII-13(a)
(Resource Capabilities
to Assist Federal Agencies)

88. This contention asserts that the Plan fails to specify the nature of the response expected from federal agencies arriving onsite in

the event of an emergency and does not specify the specific licensee, State and local resources available to support the federal response. Section 5.3.3.4 of the Plan states that the NRC Office of Inspection and Enforcement, Region I, will dispatch personnel to the EOF and TSC in the event of an emergency and will lend support in areas of observation and accident evaluation. Boyer, et al., ff. Tr. 9772, at 16. Offsite emergency plans for Limerick provide for two-way traffic on roads so as to permit a means of access through the EPZ as required by emergency vehicles enroute to the Limerick plant. In the event of an emergency at Limerick, the NRC regional team from Region I headquarters in King of Prussia would reach Limerick in approximately an hour. Additionally, the NRC could reach the plant from Region I by way of helicopter service. Sears, Tr. 9984; Kankus, Tr. 10005.

89. It is unnecessary for any NRC personnel to arrive at the TSC as a prerequisite for the Applicant to take any emergency action or initiate any offsite emergency operations. Sears, Tr. 10009.

90. The necessary resources to support the NRC's response are contained in the specific provisions describing the EOF and TSC, which are discussed in the Board's findings related to Contention VIII-8(b). Additionally, as indicated in Figure 7-2 of the Plan, the NRC will install a direct telephone line between the TSC and EOF and Region I. Boyer, et al., ff. Tr. 7992, at 16.

91. The NRC has established an immediate notification communication system with all plants. At Limerick, this is accomplished by a "red phone" in the Control Room as well as the TSC. Procedures for declaration of emergency action levels require that the red phone line be used and kept in use immediately after the classification or reclassification

of an alert or higher. The red phone provides immediate connection to the NRC in Bethesda, which has the capability of providing the information throughout the NRC organization. The use of the red phone would therefore permit constant communication with Region I through the NRC communication system. Ullrich, Tr. 10006.

92. Upon notification at an appropriate emergency action level, the Department of Energy ("DOE"), under its Radiological Assistance Program ("RAP"), will dispatch a RAP Team by Coast Guard helicopter to augment offsite radiation teams and to advise and assist as necessary to minimize the public radiation exposure. On this basis, DOE would provide advice to the Pennsylvania Bureau of Radiation Protection ("BRP") with respect to the ingestion of food and water in the area and plume tracking. BRP has the primary responsibility in these areas as discussed in the Commonwealth of Pennsylvania's Disaster Operations Plan, Annex E - Fixed Nuclear Facility Incidents, at pages E-18 to E-19. Section 5.3.3.2 of the Plan also discusses these responsibilities. When the BRP field survey team becomes activated, the Applicant assumes a support function. Support provided by PEMA for federal emergency response personnel is described in Annex E, Appendix 24. Boyer, et al., ff. Tr. 9772, at 16-17, Sears, Tr. 9990-91; Kankus, Tr. 9992.

Contention VIII-14(c)
(Methodology for Calculating Offsite Doses)

93. This contention asserts an inadequacy in the Applicant's methodology for calculating offsite doses and for analyzing offsite dosimetry. Essentially, the calculation of offsite doses is accomplished by means of a computerized dose model or, alternatively, a manual dose calculation method. Section 6.2.1 describes the

computerized Radiological and Meteorological Monitoring System ("RMMS"), which assesses offsite radiological impacts. The RMMS is a computer based, data acquisition and analysis system which provides the capabilities for making near real-time, site specific estimates of atmospheric transport and diffusion as well as offsite doses during and following an accidental airborne radioactive release. Boyer, et al., ff. Tr. 9772, at 17.

94. Although RMMS uses as inputs both actual meteorological data and plant effluent data, the inputs may be entered manually in the event that the data are unavailable. The system is designed such that, even in these circumstances, the operators respond to a selection of user-friendly and uncomplicated prompts in order to generate the required information. It is anticipated that the computerized release and dose calculational methodology of RMMS will be available by the time of the first annual exercise. In the unlikely event of a total failure of RMMS, a manual procedure has been provided which is also capable of determining off-site doses in the event of an emergency. The procedure for using the manual backup methodology is provided in EP-316. Offsite monitoring data are shared between the BRP and Applicant's EOF. The RMMS system has the capacity for remote interrogation by BRP. Boyer, et al., ff. Tr. 9772, at 17-18; Murphy, Tr. 10199.

95. Offsite dosimetry analysis will be accomplished through data provided by approximately 48 predesignated sites for thermoluminescent dosimeters ("TLD's") as listed in part in Table 7-5 and described more fully in EROL §6.1.5. The procedure for placement and recovery of offsite TLD's is being prepared on the basis of Emergency Procedure Corporate, EP-C-315 (Applicant Ex. 36), which will be implemented by the

Environmental Sampling Coordinator. Boyer, et al., ff. Tr. 9772, at 18. The placement of TLD's has been performed according to the Branch Technical Position on Regulatory Guide 4.8, which provides guidance for the location of 40 TLD stations consisting of two rings of stations as well as additional locations. Three TLD stations are located where air concentrations of radioactive releases are likely to be maximized. Daebeler, Tr. 10203. Applicant has performed an atmospheric dispersion analysis of all sectors of the plume exposure EPZ to assure the correctness of these locations. Daebeler, Tr. 10202. Three locations will provide doses as a result of the highest X/Q. In addition to areas of maximum concentration, Applicant's offsite TLD's will be appropriately located at various control points as well as specific areas of high population density and schools. Daebeler, Tr. 10204-05.

96. When an offsite release has occurred, the Health Physics and Chemistry Coordinator or alternate directs sample collectors to appropriate TLD stations where each TLD is picked up and replaced with another. Each TLD is returned to a laboratory for processing. This information is transmitted to the EOF or appropriate licensee personnel at other locations. The process of picking up and replacing TLD's is repeated as necessary depending upon the nature and duration of the release. In addition to dosimetry analysis, other environmental samples can be analyzed as described in Table 7-5 of the Plan and EROL §6.1.5. Boyer, et al., ff. Tr. 9772, at 18-19.

97. The primary purpose of Applicant's offsite TLD monitoring system is to provide routine monitoring for determining annual doses to the environment. Secondarily, the system may be used to confirm dose projections at some extended period after an emergency. In an

emergency, the monitoring system would not be used to determine the area of highest dose rate, but rather to indicate the dose in each sector of the EPZ as well as other specific locations of interest. Daebeler, Tr. 10208-10.

98. It is not possible to predict in advance of an accident where the highest dose to the population might occur. Rather, Applicant's RMMS system would serve this function if an offsite release actually occurs. Daebeler, Tr. 10210. Field survey teams, rather than the offsite TLD's, would track the plume and confirm RMMS predictions as to the location of the highest dose rates. Dubiel, Tr. 10211.

Contention VIII-14(d)
(Monitoring Instruments and Capabilities)

99. This contention alleges that the Applicant has not demonstrated the specific kinds of monitoring instruments available and their capabilities. LEA has not, however, contested Applicant's written testimony, which demonstrates its capability of monitoring airborne and effluent radiological releases with potential for offsite consequences as discussed in Section 7.3 of the Emergency Plan, all of which complies with NUREG-0737 and Regulatory Guide 1.97. In addition to these fixed onsite capabilities, state-of-the-art portable area survey instrumentation is also available for onsite use, as described in ST-7-EPP-351-0, Rev. 0 (Applicant Ex. 37). TLD's provide fixed offsite monitoring monitoring capability as described with respect to the Board's findings on Contention VIII-14(c). Additionally, the same types of portable instrumentation used onsite is also used offsite for plume tracking and measuring to confirm calculated dose rates. The real-time data provided

by such instrumentation verify dose rates calculated by the RMMS. Boyer, et al., ff. Tr. 9772, at 19-20.

Contention VIII-14(e)
(Accident Assessment Capabilities)

100. This contention asserts that the Applicant has not demonstrated adequate onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident. LEA similarly failed to contest Applicant's written testimony on this issue. The onsite radiological monitoring systems, equipment and instruments which would be utilized to provide initial values and continuing assessment throughout the course of an accident, including their specific uses and capabilities, have to some extent been described by the Board in its findings relating to Contentions VIII-14(c) and (d) and are otherwise adequate. Boyer, et al., ff. Tr. 9772, at 17-20.

101. The specific plant personnel who would utilize these data for a continuing assessment throughout the course of an accident are the Field Survey Group, which conducts offsite field surveys, the Plant Survey Group, which performs onsite and inplant surveys, the Chemistry Sampling and Analysis Team, which is responsible for obtaining and analyzing normal and post-accident samples and for assessing the results and, finally, the Dose Assessment Team, which calculates off-site exposure data from available radiological monitoring, meteorological and radiation survey data. Based upon the information provided him by these various groups, the Emergency Director performs assessment actions and monitors the effects of the emergency. The Site Emergency Coordinator obtains this information from the TSC, maintains an awareness of plant status and offsite consequences of emergency, and serves as the primary

contact for federal and Commonwealth radiological emergency response agencies in maintaining a continuing assessment throughout the course of an accident. Boyer, et al., ff. Tr. 9772, at 21-22.

Contention VIII-14(f)
(Determining Source Term
and Magnitude of Releases)

102. This contention asserts that the Applicant has not demonstrated adequate methods and techniques for determining the source term and magnitude of radioactive releases. Again, LEA abandoned its contention. Nonetheless, Applicant's testimony demonstrates that state-of-the-art methods and techniques exist for determining the source term of radioactive releases within plant systems and the magnitude of releases based on plant system parameters and effluent monitors. Essentially, Applicant can correlate the Containment High-Radiation Monitor readings (R/hr) to the percent of fuel inventory released to the containment atmosphere as a function of time after plant shutdown. Emergency Procedure Corporate EP-C-326 (Applicant Ex. 35) provides a refinement of this correlation based on analyses of containment atmosphere and reactor water samples. These samples can be obtained either by way of process sampling points or the Post-Accident Sampling System. Boyer, et al., ff. Tr. 9772, at 22-23.

Contention VIII-14(h)
(Alternate Methodologies for
Determining Release Rate and Doses)

103. This contention, also abandoned by LEA, asserts that Applicant has not demonstrated a methodology for determining the release rate and projected doses if instruments used for assessment are off scale or inoperable. Essentially, samples will be obtained from the effluent monitor sampling lines located at the point of release from the North

Stack. Actual data obtained from these points will be fed into the RMMS system. Even if the RMMS system were inoperable, a complete manual backup procedure is available to calculate releases and offsite doses. Following analysis of these samples, the information will be used in conjunction with the X/Q tables provided in EP-316 and the Regulatory Guide 1.109 dose conversion factors provided in EP-316 to calculate releases and offsite doses. Boyer, et al., ff. Tr. 9772, at 23.

Contention VIII-15(b)
(Monitoring of Site Evacuees)

104. This contention asserts that the Plan fails to establish adequate radiological monitoring of individuals evacuated from the site, including plant personnel, visitors and construction workers at Unit 2. To the contrary, adequate provisions exist for radiological monitoring of evacuees from the site. Under the provisions of EP-254, health physics personnel would pick up portable survey instruments suitable for detecting individual contamination and report to the various exit points. Portal monitors will also be used at the normal exits from the controlled area. The onsite portal monitors will monitor for contamination as fast as individuals can walk through them at a normal pace. If portal monitors are inoperable or a portal monitor alarm is activated by particular personnel, health physics personnel will use friskers or portable survey instruments to check personnel for contamination. Boyer, et al., ff. Tr. 9772, at 23-24; Dubiel, Tr. 10238, 10256.

105. If portal monitors are not working, a decision whether to monitor site evacuees randomly will be made by the Emergency Director, who assesses the need to evacuate the area rapidly as a priority. Dubiel, Tr. 10224-25. Normally, site evacuation is a priority over

personnel monitoring. Dubiel, Tr. 10258; Sears, Tr. 10260. Random monitoring will be used primarily to determine if there is a major problem with personnel contamination to assess the need for additional health physics personnel at the reassembly area. Dubiel, Tr. 10225, 10257. Those individuals not monitored at the portal monitors will be monitored again by the use of hand survey instruments at the offsite reassembly area. Dubiel, Tr. 10226-27, 10255; Kankus, Tr. 10237. This is a normal practice in health physics procedures. Dubiel, Tr. 10228.

106. Under EP-305, the Emergency Director designates the reassembly area for site evacuees and dispatches health physics technicians for personnel monitoring. Technicians are trained to monitor all individuals who depart the site without monitoring. Dubiel, Tr. 10228-30. Health physics technicians at the reassembly area will know from the Personnel Safety Team leader who has or has not been monitored prior to leaving the Limerick site. Dubiel, Tr. 10255. All individuals monitored at the reassembly area would be moved through a control point to another location to assure that all persons have been monitored. Dubiel, Tr. 10259. Individual monitoring at the reassembly area would not take a long period of time. Even in the worst case in which all site evacuees, including Bechtel and subcontractor employees were to be monitored, monitoring could be completed before the evacuees left the reassembly area. Sears, Tr. 10261.

107. Of the two predesignated reassembly areas for site evacuees at the Cromby Station and Limerick Airport, the Emergency Director would choose the area not in the downwind direction. Dubiel, Tr. 10232. The primary factor in determining which reassembly area will be designated is the direction of the plume. Because persons evacuated from the site

and other individuals evacuating the EPZ would be traveling radially outward, offsite evacuation would not be affected by evacuation from the EPZ. Dubiel, Tr. 10265. In predesignating its reassembly areas for site evacuees, Applicant has taken into consideration the Commonwealth's position in Annex E to recommend evacuation of the plume exposure pathway EPZ in a 10-mile, 360-degree radius. If the Commonwealth directs the EPZ to be evacuated, Limerick site evacuees will remain at the reassembly area until monitored. Kankus, Tr. 10236.

108. Construction site personnel would be evacuated at the alert stage. The notice to Bechtel under EP-305 that an evacuation is taking place is merely a formal notification. Accordingly, Bechtel and subcontractor employees would be evacuated prior to the declaration of a site evacuation and, ordinarily, there would be no reason for them to report to the reassembly area. Dubiel, Tr. 10231, 10252; Kankus, Tr. 10238. Bechtel and subcontractor employees would report to the reassembly area only if radiological conditions were indicated. Kankus, Tr. 10236-37.

109. At most, Bechtel personnel would experience noble gas contamination. The half-life of the primary isotopes of concern is about 15 to 30 minutes. Dubiel, Tr. 10264-65. The short half-lives of the daughter products of noble gases does not suggest a higher radioactive level for those isotopes. Dubiel, Tr. 10269.

110. Whole body counts of personnel are unnecessary during emergencies unless suspected ingestion has occurred. If ingestion has occurred, whole body counting can be done later at an appropriate facility. Whole body counts are a normal part of plant health physics operations. Boyer, et al., ff. Tr. 9772, at 24.

111. Persons requiring access to the Radiologically Controlled Area are provided with dosimetry in accordance with 10 C.F.R. §20.202. The work areas of those personnel who are not required to wear dosimetry (e.g., administration workers) will be monitored by TLD's. In addition, TLD's will be placed at appropriate areas within the site to assist in monitoring evacuation routes. Adequate monitoring, therefore, is provided for all plant personnel. Dosimeters of evacuees will be recovered and processed as soon as practicable. There is no immediate need for processing evacuees' dosimetry because they are removed from the site prior to exposure and their dosimetry can be processed in a normal time frame. If there are any visitors or construction workers in the area, they may be monitored by means of the different site TLD stations referenced in Table 7-5 of the Emergency Plan, located around the plant. Boyer, et al., ff. Tr. 9772, at 24-25.

Contention VIII-15(d) and 16(g)
(Decontamination of Site Personnel)

112. These contentions assert that the Plan lacks adequate decontamination capabilities for site personnel. During an emergency, personnel will be monitored for contamination upon exiting the affected area (at the access control point) or upon exiting the Radiologically Controlled Area of the plant. Personnel requiring decontamination will be directed to the decontamination station in the Radwaste Enclosure or the TSC, which will be manned by health physics personnel. Decontamination will be conducted in accordance with standard health physics practices as described in Section 6.5.2 of the Plan. Basically, this simply involves the removal of any contaminated clothing and showering with soap and water. Mild chemicals (e.g., potassium permanganate) may also

be used. In the event that normal decontamination techniques cannot reduce the contamination below pre-defined action levels, qualified medical assistance in the decontamination effort will be obtained through outside organizations (e.g., RMC). If necessary, replacement clothing will be issued. Boyer, et al., ff. Tr. 9772, at 25, 31.

113. Individuals identified by onsite personnel monitoring as contaminated will be directed offsite or held onsite for decontamination, depending upon existing priorities at the time. Two shower facilities exist onsite for decontamination. Dubiel, Tr. 10239. The decontamination facilities onsite are designated primarily for those who remain behind. Dubiel, Tr. 10243-44.

114. The predominate type of contamination expected during any evacuation would be on the shoes and outer clothing. Ordinarily, this would be caused by short-lived daughter products of noble gases, which makes decontamination unnecessary or simply a matter of changing clothes. If decontamination were nonetheless required for offsite evacuees at the reassembly area, the procedure would be to collect contaminated clothing and if necessary, to wash exposed areas of the skin through the use of a damp washcloth or to clip contaminated portions of the hair. The same procedure would be used initially onsite. Showering is only necessary if other methods fail, and it is unlikely that other methods would fail for evacuees. Dubiel, Tr. 10243, 10266.

115. Transit time from the Limerick site to the reassembly area is approximately 5 to 10 minutes. Additional time prior to monitoring reassembled site evacuees, if necessary, would be up to an hour. There are no anticipated health hazards to the individual by reason of his

possible contamination within that additional period of time. Dubiel, Tr. 10262-63.

116. As regards decontamination of injured persons, Applicant's employees will be trained in administering first aid for injuries and decontamination. Injured persons at the site would be decontaminated to the extent possible, depending on the patient's condition. There are, however, circumstances under which decontamination would not be medically indicated, as in the case of a very serious back injury. Linnemann, Tr. 9826.

117. For each injured person transported to a hospital, a PECO-qualified radiation protection technician will be provided in the ambulance at the receiving hospital or at least upon arrival of the ambulance at Pottstown Memorial as further described in EP-252. Dubiel, Tr. 9828; Applicant Ex. 43, at 2. The radiation protection technicians from the Limerick plant as well as technicians in the hospital, chiefly X-ray technicians, will be largely responsible for the control of contamination. Linnemann, Tr. 9869.

118. About 20 Limerick personnel will be trained and available to support offsite transportation of an injured patient to a hospital. Dubiel, Tr. 9876. The same or different health physics personnel could, depending upon the situation, assist the injured individual with first-aid treatment, prepare the individual for ambulance transport and accompany the individual to the hospital. These personnel will be trained in procedures on transporting an injured contaminated individual to a hospital, including contamination control and monitoring, and protection of ambulance personnel and staff from contamination. The

training would also familiarize these personnel with the plans at the hospital. Dubiel, Tr. 9876-77.

Contention VIII-15(e)
(Personnel Accountability)

119. This contention asserts that Applicant lacks a capability within 30 minutes to account for all individuals onsite at the time of an emergency. Personnel assembly and accountability onsite is accomplished pursuant to EP-110. Kankus, Tr. 10244; Dubiel, 10245. As stated in EP-110 at page 3, the Security Team must inform the Emergency Director of the accountability status of onsite personnel, based on reports from the various assembly area coordinates, within 30 minutes after the assembly announcement is made. Boyer, et al., ff. Tr. 9772, at 26; Kankus, Tr. 10247.

120. Exiting personnel deposit their badges with the security guards. The guards will have computer printouts indicating personnel in the plant that day. They will check off badge numbers against that list to account for all personnel. Kankus, Tr. 10251.

121. The status report to the Emergency Director may simply note that certain individuals or areas have not yet reported, which would indicate that those personnel should be considered missing, unless located in another place. Kankus, Tr. 10247-48.

122. If certain individuals cannot be accounted for at the time of the initial 30-minute report to the Emergency Director, either through collection of their badges or by other reporting personnel, a search and rescue team would be formed and dispatched to the last known location of the person. They would keep searching until the individual has been located. Kankus, Tr. 10266.

Contention VIII-15(f)
(Protection of Site Personnel)

123. This contention asserts that Applicant has not made sufficient provisions for individual respiratory protection, protective clothing and individual thyroid protection. LEA also failed to pursue this issue at the hearing. Nonetheless, adequate provision has been made for the use of onsite protective equipment and supplies for emergency personnel remaining onsite during an emergency under Section 6.4.2.1 of the Plan (individual respiratory protection), Section 6.4.2.2 (issuance of protective clothing) and Section 6.4.2.3 (distribution and use of potassium iodide (KI) for emergency workers).

Contention VIII-16(c)
(Information for Emergency Workers)

124. This contention, which LEA also failed to pursue at hearing, asserts that the Plan does not demonstrate how emergency workers will have sufficient information concerning radiation risk to make an informed judgement regarding exposure. Plant implementing procedures require specific authorization by the Emergency Director for a volunteer to receive projected whole body doses or thyroid doses in excess of predesignated occupational exposure limits applicable to all emergency personnel. These limits, which incorporate the requirements of 10 C.F.R. §§20.101 and 20.102 and the "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA 520/1-75-001) are also reproduced in the implementing procedures for the various emergency teams which will perform onsite emergency functions. It is up to each emergency worker to decide for himself, based upon his prior training, skills and knowledge as well as an explanation at the time of the risk involved, whether he will volunteer for the activity indicated.

Emergency workers, like all site personnel, will have had basic training in the biological effects of ionizing radiation. Additionally, projected doses provided at the time of an emergency by health physics personnel will give the volunteer the specific data necessary for an informed decision. Boyer, et al., ff. Tr. 9772, at 27-28.

Contention VIII-16(d)
(Distribution and Analysis of Dosimetry)

125. This contention asserts that the Plan fails to establish 24 hour-per-day capability to determine doses received by onsite emergency workers and that adequate provisions has been made for distribution and reading of dosimetry. As found by the Board with respect to Contention 15(b), personnel monitoring required by 10 C.F.R. §20.202 is provided by the issuance of TLD's, direct reading pocket dosimeters, or calculations from area survey data and exposure times. Exact procedures and equipment for personnel monitoring are fully described in FSAR § 12.5.2.2.4. Boyer, et al., ff. Tr. 9772, at 29.

126. Capability on a 24-hour basis to determine doses received by emergency workers will be available under the procedures for reading TLD's. This service will be provided by individuals trained and qualified to operate the processing equipment, who will be onsite or available within an hour. Individual personnel will be trained under the General Employee Training Program described in FSAR §12.5.3.5.1, and thus will be able to read the self-reading pocket dosimetry. Boyer, et al., ff. Tr. 9772, at 29.

127. In the event of an actual radiological emergency, health physics technicians would take the pocket dosimeters from the exiting personnel, read the dosimeter, and record the dose indicated. Personnel

whose dosimetry readings exceed prescribed levels would report to the dosimetry office in the TSC for immediate processing of their TLD's. Individuals exiting radiologically affected areas would not be permitted to re-enter those areas until it has been determined that their doses are below limits permissible under 10 C.F.R. Part 20. A health physics technician will be stationed at each entry point into an affected area. Any emergency worker entering such area will be given a specific stay-time or dose level which may not be exceeded. Self-reading pocket dosimeters will be issued to personnel required to enter radiologically affected areas. In addition, ring or clip-on dosimeters for various extremities which might be particularly subject to exposure will be used. Personnel exposure records are maintained pursuant to "Practice for Occupational Radiation Exposure Record Systems," ANSI N13.6, as stated in FSAR §12.5.2.2.4. Boyer, et al., ff. Tr. 9772, at 29-31.

128. As part of the monitoring process for personnel exiting radiologically affected areas, a health physics technician would determine if contamination were in the area of the nose or mouth, or if there were reason to believe that respiratory protection equipment may have failed. In that event, the individual would be directed to the whole body counting room in the TSC where bioassay is conducted. Boyer, et al., Tr. 9772, at 31.

129. All individuals reporting from offsite organizations in support of an emergency response at Limerick will receive a self-reading TLD. Predesignated TLD's will be issued to these individuals by security personnel as they arrive onsite. Dubiel, Tr. 10221-22.

Contention VIII-18
(Training Personnel of Offsite
Support Organizations)

130. This contention asserts that the Plan does not demonstrate adequate training for those who may be called upon to assist onsite in an emergency. Initial training and periodic retraining for offsite emergency response organizations and support personnel are described in Section 8.1.1 and Table 8-1 of the Plan. As discussed in Table 8-1, radiation protection practices includes training on risk factors, use of dosimetry, radiation risks, and the specific means by which onsite emergency workers will be directed and informed of radiation risk areas and contamination areas as they enter the site. Dubiel, Tr. 10046. Emergency workers will be instructed that their TLD's will be collected after the event, that the individual's exposure will be determined by reading the TLD, and that he will be informed of the result. Dubiel, Tr. 10047. This training would be provided for fire companies, ambulance services, and local physicians. Training sessions will be conducted by seminar with lesson plans appropriate to their specific task. Boyer, et al., ff. Tr. 9772, at 31-32; Kankus, Tr. 10045.

131. Such training is based upon the principle that radiation workers have the right to whatever information on radiation risk is available to enable them to make informed decisions regarding the acceptance of those risks. Dubiel, Tr. 10019.

132. Offsite emergency workers are given information that relates the risk of exposure to low levels of ionizing radiation much in the context as in the BEIR-3 Report, i.e., the increased probability of injury, illness or death due to radiation, health effects such as leukemia and birth defects, exposure limits under NRC regulations and

the concept of health effects dose models, the acute effects of high levels of exposure, the levels of radiation exposure to which the workers might be exposed, latent effects of low levels of radiation exposure, including damage to genetic material, the ALARA principle and risk to the individual even if doses are below levels established by regulation, and the hazards of internal exposure, including the manner in which radioactive materials may enter the body and migrate, depending upon isotopic chemical form. Dubiel, Tr. 10019-29, 10,038-39. All of the information required to be given pursuant to Regulatory Guide 8.13 is also provided. Dubiel, Tr. 10033, 10036.

133. Offsite emergency workers are presented information about techniques for calculating doses and methods for monitoring exposure. Dubiel, Tr. 10039. They are trained to read self-reading dosimetry and obtain additional information on radiation doses from BEIR-3. Dubiel, Tr. 10040, 10046.

134. Firefighters are given information on respiratory protective equipment, advising that their normal equipment and procedures for use of that equipment are adequate for use at Limerick in a radiological emergency. Dubiel, Tr. 10041.

135. Training of offsite emergency workers will be given by members of Applicant's nuclear training section, who provide such training full-time. Applicant's management and supervisory staff in the appropriate discipline assure that each individual instructor is properly qualified. Dubiel, Tr. 10042. Lesson plans are prepared by persons qualified in the relevant discipline and based in part upon standards and criteria from applicable Regulatory Guides. Dubiel, Tr. 10051.

136. Offsite workers will not be exposed to high levels of radiation which present a risk of acute effects. Dubiel, Tr. 10048. The Emergency Director will not ask for volunteers among offsite response personnel to exceed the recommended dose levels in Table 6-1 of the Plan. The Emergency Director would rely upon Applicant's employees for those situations. Dubiel, Tr. 10054-55. Emergency procedures for authorizing an individual to exceed the limits under 10 C.F.R. Part 20 require that the individual have appropriate training, which is available only to Applicant's emergency workers. Dubiel, Tr. 10056.

137. Because supporting offsite fire, ambulance and medical personnel will be required to render services at Limerick in the event of emergency only when escorted by trained site personnel, it is unnecessary to provide the offsite response personnel with the further orientation and General Employee Training provided to site personnel as described in FSAR §12.5.3.5. Boyer, et al., ff. Tr. 9772, at 32.

Conclusions of Law

Based upon the foregoing Findings of Fact which are supported by reliable, probative and substantial evidence as required by the Administrative Procedure Act and the Commission's Rules of Practice, and upon consideration of the entire evidentiary record in this proceeding, the Board reaches the following conclusion pursuant to 10 C.F.R. §2.760a:

Applicant has demonstrated that the state of onsite emergency preparedness, as reflected by its Emergency Plan and implementing procedures, provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the Limerick Generating Station.

Order

WHEREFORE IT IS ORDERED in accordance with 10 C.F.R. §§2.760, 2.762, 2.764, 2.785 and 2.786 of the Commission's Rules of Practice, that this Partial Initial Decision shall become effective immediately and shall constitute with respect to the matters decided therein the final action of the Commission forty-five (45) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice.

Exceptions to this Partial Initial Decision may be filed by any party within seven (7) days after service of this Partial Initial Decision. Within fifteen (15) days thereafter (twenty (20) days in the case of the Staff), any party filing such exceptions shall file a brief in support thereof. Within fifteen (15) days of the filing of the brief of the appellant (twenty (20) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND LICENSING BOARD

Judge Lawrence Brenner, Chairman

Judge Peter A. Morris, Member

Judge Richard F. Cole, Member

Dated at Bethesda, Maryland
this _____ day of _____