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USNRC

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

'84 APR 23 A11:08

Before the Atomic Safety and Licensing Board

OF SECRETARY
OF ENERGY
& SERVICE
BRANCH

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

APPLICANT'S TESTIMONY RELATING
TO ONSITE EMERGENCY PLAN CONTENTIONS

Panel - Vincent S. Boyer, Werner T. Ullrich, Roberta A.
Kankus, Richard W. Dubiel, George F. Daebeler, Gary W.
Murphy, Gary J. Reid, and Dr. Roger E. Linneman.

Contention VIII-1

1. Section 4.2 of the Limerick Emergency Plan^{1/}
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, Table 4-2 includes events which are greater in radio-
logical consequences than design basis accidents. For
example, the events described in Table 4-2, Items IIId and

^{1/} 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.
Implementing procedures for the Limerick Emergency Plan
are contained in EP-101 et seq.

IVd exceed design basis. Additional examples have been added to Table 4-2 to reflect the other 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 additional examples include the specific example boiling water reactor ("BWR") sequences listed therein. The specific changes in the Emergency Plan which will be made are set forth in the revised Table 4-2, which will be made a part of the Emergency Plan upon formal submission. Dose calculations in Table 4-1 pertain solely to design basis accidents. The procedures for calculating dose consequences for accidents exceeding design basis are set forth in Section 6.2 as discussed in response to Contention VIII-14, infra and are the same no matter what the severity of the accident. [V. Boyer, R. Kankus]

Contention VIII-3

2. The Emergency Plan identifies the established onsite monitoring systems used to initiate emergency measures in accordance with the emergency action levels designated by NUREG-0654, Appendix 1. Geophysical phenomena monitors are addressed in Section 7.3.1 of the Emergency Plan, which specifically states that seismic instrumentation includes time-history accelerographs, peak recording accelerographs and seismic switches as discussed in FSAR Section 3.7.4. Specific instrumentation used in emergency

action level declaration is provided in Appendix EP-101-2.
[V. Boyer, R. Kankus]

3. Section 7.3 of the Emergency Plan provides information as to the acquisition of meteorological data. The capability of acquiring and evaluating meteorological information sufficient to meet the criteria of NUREG-0654, Appendix 2, is provided by assessing meteorological data from two meteorological towers on the site. The Limerick meteorological system has been designed in depth to provide information even if a key input parameter is unavailable. RMMS will automatically switch to a secondary or even a tertiary sensor if a primary sensor fails. Meteorological data are available from two independently powered towers. 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. [V. Boyer, R. Kankus, G. Daebeler, G. Murphy]

4. The meteorological data include 15 minute averages of wind speed and direction, sigma theta, and vertical temperature difference measurements for atmospheric stability determination, as described more fully in Section 6.2.1 of the Emergency Plan. As this section also states, RMMS data files and calculational capabilities are available to personnel in the Control Room, TSC, and 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. [V. Boyer, R. Kankus, G. Daebeler, G. Murphy]

5. Radiological monitors are discussed in response to Contentions VIII-14(d) and are 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 Radiological and Meteorological Monitoring System. Appendix EP-101-8 reflects monitors which would indicate fuel damage. [V. Boyer, R. Kankus, R. Dubiel, G. Daebeler]

6. Process monitors (radiological) are discussed in FSAR Section 11.5. Process and effluent radiological monitoring systems are summarized in Table 7-3 of the Emergency Plan. Area and airborne radiologically monitoring are discussed in FSAR Section 12.3.4. Area and airborne radiological monitoring systems are also described in Table 7-4. [[V. Boyer, R. Kankus, R. Dubiel, G. Daebeler, G. Murphy]

7. Process monitors (non-radiological) are described in FSAR Sections 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). Process monitors are addressed in the various Appendices to EP-101.

For example, Appendix EP-101-11 refers to reactor level less than -129 inches. [V. Boyer, R. Kankus, G. Leitch]

Contention VIII-6(a)

8. The only organizations with responsibility for onsite augmentation of the function performed by Applicant under its Emergency Plan are the Linfield Fire Company and Limerick Fire Company, as discussed in response to Contention VIII-11. Letters of agreement with each of these organizations have been obtained, which state that each fire company will provide all requested support for the Limerick Generating Station and that each company agrees to respond whenever called. [V. Boyer, R. Kankus]

9. Inasmuch as the agreements with the Linfield and Limerick Fire Departments provide that they will respond to a request for assistance at Limerick based upon Applicant's determination that such support is necessary, mutually agreeable bases exist for notification of these response organizations. [V. Boyer, R. Kankus]

Contention VIII-6(c)

10. The actions applicable to each emergency action level and the response organizations involved are discussed in Section 3.3 of the Emergency Plan. Section 6.1 governs emergency organization activation. It states that the response organizations designated in Section 3.3 would be notified as appropriate upon declaration of each particular emergency action level. Specifically, Section 6.1.1 states

that emergency organization activation for unusual events is initiated as follows:

"Notification shall be within about 15 minutes from the time at which the operators recognize events have occurred which make declaration of an emergency class appropriate."

Sections 6.1.2, 6.1.3 and 6.1.4 address emergency organization activation for an alert, site emergency and general emergency, respectively, and state the 15 minute notification requirement of Section 6.1.2 as applicable to those situations. [V. Boyer, R. Kankus]

Contention VIII-7(c)(3)

11. Applicant's compliance with the minimum staffing requirements stated in NUREG-0654, Table B-1, is reflected in Table I-1 of the Emergency 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. As indicated by Table I-1, the Applicant's plans for augmenting onsite personnel fully meet the requirements of NUREG-0654. Personnel augmentation is also covered in the various "phone list" and team activation procedures. [V. Boyer, R. Kankus, G. Leitch]

Contention VIII-8(b)

12. Emergency Plan descriptions of the Emergency Operations Facility ("EOF"), Technical Support Center

("TSC"), and Operations Support Center ("OSC"), including emergency equipment and supplies, are contained in Sections 7.1.2, 7.1.3 and 7.1.4 of the Emergency Plan. These sections describe the physical layout, equipment, documents and supplies necessary for the efficient and reliable operation of these facilities. Further information has been provided in response to NRC Question 810.30. When fully functional, these facilities will meet the requirements of NUREG-0737, Supp. 1. The only additional information contemplated for submittal is a floor plan which will indicate positioning of particular personnel in these facilities. [V. Boyer, R. Kankus]

Contention VIII-10(a)

13. As reflected in Appendix A of the Emergency Plan, letters of agreement have been executed by the Linfield Fire Company and Limerick Fire Company, by which they have agreed to provide any equipment or manpower that will be needed now or in the future at Limerick in the event of a fire. Under the procedures applicable to Montgomery County, fire department equipment and personnel are dispatched by the County at the request of the Limerick Generating Station. [V. Boyer, R. Kankus, R. Linneman]

14. In the event that either fire department 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. Once onsite, the fire department would be under the

direction and control of Applicant's fire fighting team leader. The Shift Supervisor will assume the role of Firefighting Group Leader, and direct firefighting efforts to control fire and other related incidents. Accordingly, Applicant's onsite personnel will retain responsibility for the direction and control of responding fire companies in the event of a fire at Limerick. An escort will accompany fire department personnel at all times while onsite. [V. Boyer, R. Kankus, R. Linneman]

15. Responsibilities of the Hospital of the University of Pennsylvania ("HUP") and the Pottstown Memorial Medical Center ("Pottstown Memorial") with regard to the treatment of contaminated, injured patients transported from the Limerick site are discussed in the letters of agreement contained in Appendix A of the Emergency Plan. [V. Boyer, R. Kankus, R. Linneman]

16. Under the agreement between Applicant and Pottstown Memorial, Pottstown Memorial will provide the primary medical care in the event that treatment of contaminated, injured victim(s) is necessary. It is anticipated that Pottstown Memorial will be able to handle a number of such cases utilizing its routinely available facilities and resources. In the event that larger numbers of contaminated, injured victims 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 Radiation Management Corporation ("RMC") for hospitals generally, which will be adapted to the specific facilities and staffing for Pottstown Memorial. Essentially, Emergency Room staff will institute triage principles based upon injury. 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. [V. Boyer, R. Kankus, R. Linneman]

17. 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. 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). [V. Boyer, R. Kankus, R. Linneman]

18. HUP has entered a general agreement with Radiation Management Corporation ("RMC") for the treatment of such patients on behalf of particular facilities with which RMC has separate agreements, e.g., Susquehanna Steam Electric Station, Salem Nuclear Generating Station and Calvert Cliffs

Nuclear Power Plant. By agreement between RMC and Applicant, Limerick is included among the facilities so designated. Under this agreement, HUP will provide treatment in addition to Pottstown Memorial as necessary for contaminated, injured victims from the Limerick site. In this regard, HUP will also be utilized in the event that Pottstown Memorial were unavailable because of a general evacuation of the plume exposure pathway EPZ. [V. Boyer, R. Kankus, R. Linneman]

19. Ambulances which provide transportation services to offsite medical facilities are governed by the same access control procedures described above with respect to fire companies. As regards helicopter transporting services, the helicopter would be directed to land outside the restricted area of the plant, to which location the patient would be transported. When possible, given the immediacy of the need for medical treatment, patients released for transportation to offsite medical facilities will undergo decontamination in accordance with standard health physics procedures. A letter of agreement between Applicant and Goodwill Ambulance Unit is contained in Appendix A, which provides for arrangements for Goodwill to respond to a call for assistance to Limerick and provide necessary transportation services to hospitals as needed. Each of the five ambulances available from Goodwill has a capacity for transporting two patients. A letter of agreement is also being obtained to provide a back-up capability. [V. Boyer, R. Kankus, R. Linneman]

20. In the event that additional resources were necessary, more than two patients could be transported by an ambulance. If sufficient ambulance service were nonetheless unavailable for any reason, transportation to Pottstown Memorial or HUP will be made by the Keystone Helicopter Service. Such transportation would be coordinated through RMC under the terms of the letter of agreement. [V. Boyer, R. Kankus]

21. Private vehicles onsite would provide a separate, alternative capability for transporting contaminated, injured victims even if there were a shortage of other transportation. For less severe injuries (e.g., broken arm), such patients need not be transported by ambulance and could be easily conveyed by automobile. In addition to the personal decontamination for the victim discussed above, the transporting vehicle would be protected against contamination by some appropriate means of covering, such as plastic liners or anti-contamination clothing. [V. Boyer, R. Kankus, R. Linneman]

22. Agreements with local physicians have been reached as reflected in Appendix A to supply onsite medical assistance. Under these agreements, each physician assumes the responsibility for medical supervision of the patient(s) until arrival at a medical facility such as Pottstown Memorial or until such time that the physician's services are no longer required. The physicians under these

agreements would be bound by the same access control provisions discussed above. [V. Boyer, R. Kankus, R. Linneman]

23. The Limerick Emergency Plan states the responsibilities of the Pennsylvania State Police with respect to access control during any potential radiological emergency at the site. See Section 5.3.3.3 of the Emergency Plan and FSAR §2.1.2.3. [V. Boyer, R. Kankus, G. Leitch]

Contention VIII-11

24. 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 handle any credible fire at Limerick and will limit fire damage to structures, systems, or components important to safety so that the capability to safely shut down the plant is ensured. [V. Boyer, G. Reid]

25. As indicated in Sections 2.2.4 and 5.3.2.3, the Linfield Fire Company will provide firefighting assistance to Limerick upon request. Additionally, an agreement has been obtained from the Limerick Fire Company, by which it agrees to provide firefighting services upon request. The commitment to provide such assistance is reflected in letters of agreement. [V. Boyer, R. Kankus]

26. Last year, the Linfield Fire Company responded to 86 calls. Only once was it already dispatched when another call was received. Based on this operational experience, it was determined that the back-up provided by the Limerick Fire Company is sufficient. Although Applicant has determined that its onsite fire protection equipment and systems are adequate, it is noted that Linfield and Limerick Fire Company equipment is purchased to National Fire Protection Association standards. [V. Boyer, G. Leitch, G. Reid]

Contention VIII-12(a)

27. 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 secured by its consultant/contractor RMC, which has obtained such services for a

number of other facilities identified in response to Contention 10(a).

28. Section 2.2.4 of the Emergency Plan lists the Radiation Medicine Center of HUP as a local agency which has agreed to provide support services in response to requests for assistance at the Limerick Generating Station. The delineation of these services in providing treatment of contaminated, injured victims is discussed more fully in Section 5.3.2.1 of the Emergency Plan. In the context of discussing possible protective actions, which may include medical treatment, Section 6.5.4 also refers to available medical facilities. Specifically, reference is made to RMC, which, as noted in the discussion above, has an agreement with the HUP for medical treatment of a number of nuclear facilities, including Limerick, in the event of a radiological emergency. [V. Boyer, R. Kankus, R. Linneman]

29. The Radiation Plan developed by RMC for HUP will be modified to relate to the physical character and staffing of the Pottstown Memorial Medical Center so as to enable Pottstown Memorial to handle in the range of up to 25 contaminated, injured individuals. This will involve normal triage decisionmaking and the expansion of hospital facilities to accommodate contaminated injured victims as need be. Plans provide for the possibility that Pottstown Memorial may be evacuated as part of a general evacuation of the plume exposure pathway EPZ, as discussed with respect to Contention VIII-10(a). [V. Boyer, R. Kankus, R. Linneman]

Contention VIII-12(b)

30. The availability of sufficient ambulance service has been discussed previously in response to Contention VIII-10(a). When possible, the patient will be decontaminated to the extent possible prior to transportation offsite to a medical facility, consistent with the need for prompt medical attention. As discussed in Section 6.5.3 of the Emergency Plan, shielding for ambulance attendants and/or the helicopter pilot during transportation of contaminated patients will be supplied. Essentially, plastic liners and anti-contamination clothing will be utilized. Decontamination of ambulance attendants would be accomplished at the accepting medical facility by normal washing and removal of clothing. If necessary, such personnel could be transported back to the Limerick site for decontamination in accordance with the generally applicable health physics procedures as discussed in response to Contention 15(d). A health physics technician will accompany the patient in the ambulance to monitor contamination levels and to assist medical personnel at the hospital as further described in EP-252. [V. Boyer, R. Kankus, R. Linneman, R. Dubiel]

31. Adequate radiological protection is provided by anti-contamination clothing worn by ambulance attendants as well as plastic wrapping which is used to cover the patient and surfaces of the ambulance. [V. Boyer, R. Kankus, R. Linneman, R. Dubiel]

Contention VIII-13(a)

32. The provisions for participating governmental agencies providing onsite support in an emergency response at Limerick are contained in Section 5.3.3 of the Emergency Plan. Specifically, Section 5.3.3.4 indicates that the Office of Inspection and Enforcement, Region I, Nuclear Regulatory Commission, 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. The necessary resources to support this response are contained in the specific provisions describing the EOF and TSC, which are discussed in response to Contention VIII-8(b) above. Additionally, as indicated in Figure 7-2 of the Emergency Plan, the NRC will install a direct telephone line between the TSC and EOF and Region I. [V. Boyer, R. Kankus]

33. Upon notification at an appropriate emergency action level, the Department of Energy ("DOE"), under its Radiological Assistance Program ("RAP"), will dispatch a RAP Team to augment offsite radiation teams and to advise and assist as necessary to minimize the public radiation exposure. Technical advice and environmental monitoring provided by the RAP Team will support the efforts of the Pennsylvania BRP, which has the primary responsibility in these areas as discussed in Annex E, pages E-18 to E-19. The specific responsibilities of BRP, as outlined in Annex E, are also referenced in Section 5.3.3.2 of the Emergency Plan. 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. No further federal support response is anticipated. [V. Boyer, R. Kankus, W. Ullrich]

Contention VIII-14(c)

34. The methodology for calculation of offsite doses is explained in the discussion of assessment actions in Section 6.2 and summarized in response to NRC Question 810.41. Essentially, this calculation is accomplished by means of a computerized dose model or, alternatively, a manual dose calculation method. Section 6.2.1 describes the computerized Radiation 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. [V. Boyer, R. Kankus, G. Daebeler, G. Murphy]

35. 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 is 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. As discussed in the responses to NRC Questions 810.5(b) and 810.37, offsite monitoring data are shared between the Bureau of Radiation Protection and the Emergency Operations Facility. [V. Boyer, R. Kankus, G. Daebeler, G. Murphy]

36. The procedure for placement and recovery of offsite thermoluminescent dosimeters ("TLD's") is being prepared on the basis of Emergency Procedure Corporate, EP-C-315, which will be implemented by the Environmental Sampling Coordinator. [V. Boyer, R. Kankus, G. Daebeler]

37. Offsite dosimetry analysis will be accomplished through data provided by approximately 48 predesignated sites for TLD's as listed in part in Table 7-5. The operation of this program is described more fully in EROL Section 6.1.5. When an offsite release has occurred, the Health Physics and Chemistry Coordinator or alternate(s) directs sample collectors to appropriate TLD stations where each emergency TLD badge is picked up and replaced with another badge. Each TLD badge 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 badges is repeated

as necessary depending upon the nature and duration of the release. In addition to dosimetry analysis, other environmental samples can be analyzed. The Emergency Plan requires sampling airborne particulates, airborne radioiodine, surface water, drinking water, and milk, as indicated in Table 7-5, which will be implemented by EP-C-315. This sampling program is also described in EROL Section 6.1.5. [V. Boyer, R. Kankus, G. Daebeler]

Contention VIII-14(d)

38. The Limerick facility has the capability of monitoring airborne and effluent radiological releases with potential for offsite consequences. Onsite and offsite monitoring equipment and systems are discussed in Section 7.3 of the Emergency Plan. All such systems and equipment meet the requirements of NUREG-0737 and Regulatory Guide 1.97. Specifically, three fixed onsite capabilities exist which provide indications displayed in the Control Room and provide input to the RMMS. First, the North Stack Ventilation Exhaust Radiation Monitoring System, as discussed more fully in FSAR Section 11.5.2.2.1, will measure noble gas activity and provide samples of iodine and particulate effluents. Second, the Meteorological Measurement System, as discussed more fully in FSAR Section 2.3.3.2., consists of two main towers (Tower No. 1 primary, Tower No. 2 secondary) containing instrumentation providing wind speed and direction, temperature and atmosphere stability measurements. This system is used to predict overall

meteorological conditions around the site. Third, the Containment High-Range Monitors, as described more fully in FSAR Sections 7.5.1.4.2.1.5, 7.6.1.1.6, and 11.5.2.3.1, measure gross radiation levels in the drywell, which are used as an indication of fuel failure. [V. Boyer, R. Kankus, G. Daebeler, G. Murphy]

39. In addition to these fixed onsite capabilities, portable area survey instrumentation is also available for onsite use. The Limerick Health Physics Department is using state-of-the-art portable survey equipment. Instrumentation specifically dedicated for emergency use is described in ST-7-EPP-351-0, Rev. 0. This instrumentation includes air samplers, count rate meters, ion chambers, GM survey instruments, and radioiodine monitors. Ion chambers used will include the Eberline RO2 survey meter. This instrument will cover ranges from 0-5 R/hr. Geiger-Mueller instruments will include the Eberline E-520 survey meter. The range covered by this equipment is from 0-2 R/h. [V. Boyer, R. Kankus, R. Dubiel, G. Murphy]

40. Offsite monitoring capability also exists. As described in response to subpart (c) above, TLD's are used as fixed offsite monitoring instruments. 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. [V. Boyer, R. Kankus, G. Dubiel]

Contention VIII-14(e)

41. 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, are described in response to subpart (d) above. In addition, a more detailed description of the Radiation and Meteorological Monitoring System is given in Section 6.2.1 of the Emergency Plan, as discussed in response to subpart (c) above. [V. Boyer, R. Kankus, G. Daebeler, G. Murphy]

42. The specific plant personnel who would be available to utilize these data for a continuing assessment throughout the course of an accident are described in Section 5 of the Emergency Plan. Groups of personnel with specific responsibility for evaluating radiological data include a number of teams. The Radiation Protection Team, as described in Section 5.2.2.2.1, includes the Field Survey Group, which conducts offsite field surveys. The Plant Survey Group, which performs onsite and inplant surveys, is part of the Personnel Protection Team. The Chemistry Sampling and Analysis Team, as described in Section 5.2.2.2.4, is responsible for obtaining and analyzing normal and post-accident samples and for assessing the results. Finally, the Dose Assessment Team, as described in Section 5.2.2.2.8, calculates off-site exposure data from available

radiological monitoring, meteorological, and radiation survey data. [V. Boyer, R. Kankus, R. Dubiel]

43. Based upon the information provided him by these various groups, the Emergency Director or Interim Emergency Director performs assessment actions and monitors the effects of the emergency as directed by Section 5.2.1.1.f. 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 as directed by Sections 5.2.1.3.b, c and f. [V. Boyer, R. Kankus, G. Leitch, W. Ullrich]

Contention VIII-14(f)

44. State of the art methods and techniques exist for determining the source term of releases of radioactive material within plant systems and the magnitude of releases based on plant system parameters and effluent monitors. "Source term" in this context means the radioactive material available for release from primary containment. As stated in response to NRC Question 810.40, Appendix B of the Emergency Plan and EP-325 provide a simple mechanism for correlating 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 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 as described in response to Question 810.40, and Sections 6.2.3.1 and 6.2.3.2 of the Emergency Plan. A further description of these systems is given in FSAR Sections 11.5.4 and 11.5.5.
[V. Boyer, R. Kankus, G. Murphy]

Contention VIII-14(h)

45. The methodology for determining the release rate and projected doses if instrumentation used for assessment is offscale or inoperable is described in Section 6.2.3 of the Emergency Plan, as explained in response to subpart (f) above. 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.
[V. Boyer, R. Kankus, G. Daebeler, G. Murphy]

Contention VIII-15(b)

46. 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. 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 such personnel for contamination. [V. Boyer, R. Kankus, R. Dubiel]

47. 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. [V. Boyer, R. Kankus, R. Dubiel]

48. Persons requiring access to the Radiologically Controlled Area are provided with dosimetry in accordance with 10 C.F.R. §20.202. Those personnel who are not required to wear dosimetry (e.g., administration workers) will have their work areas 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. As stated in Section 6.4.1.1.e, dosimetric devices of evacuees will be recovered and processed as soon as practicable. There is no immediate need for processing dosimetry of evacuees because they are removed from the site prior to exposure and their dosimetry can be processed in a normal

time frame. In areas in which neutron exposure is suspected, health physics personnel in the area will utilize a neutron monitor to determine neutron dose rate, as stated in Section 6.4.1.1.e. Basically, neutron exposure is determined by multiplying neutron dose rate by stay time. 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. [V. Boyer, R. Kankus, R. Dubiel]

Contention VIII-15(d)

49. Monitoring points for site evacuees are contained in EP-254, as discussed in response to subpart (b) above. As stated therein, any contaminated personnel will be assembled for decontamination at the TSC or Radwaste Enclosure in accordance with standard health physics practices. The basic procedures and facilities for decontamination are described in Section 6.5.2. Basically, this simply involves the removal of any contaminated clothing and showering. Routine decontamination procedures will be utilized, including mild soap and water or mild chemicals (e.g., potassium permanganate). 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., Radiation Management Corporation). If necessary, replacement clothing will be issued. [V. Boyer, R. Kankus, R. Dubiel]

Contention VIII-15(e)

50. Accountability for all individuals onsite at the time of an emergency is covered by Section 6.4.1.1.d, which states that the Personnel Safety Team and Security forces shall perform this function. As stated in EP-110 at page 3, the Security Team must inform the Emergency Director of the accountability status of onsite personnel within 30 minutes after the assembly announcement is made. [V. Boyer, R. Kankus, G. Leitch, R. Dubiel]

Contention VIII-15(f)

51. Adequate provision has been made for the use of onsite protective equipment and supplies for emergency personnel remaining onsite during an emergency. Specifically, Section 6.4.2.1 provides for individual respiratory protection. There is no need to have individual respiratory protection for radiological purposes for certain persons, e.g., those in habitable areas such as the Control Room and the TSC, although respiratory equipment is provided for personnel in the Control Room in the event of a fire or offsite accident involving release of toxic chemicals. [V. Boyer, R. Kankus, R. Dubiel]

52. Section 6.4.2.2 provides for the issuance of protective clothing. If necessary, anti-contamination clothing will be issued to all workers entering affected areas. This clothing is issued to emergency teams and other personnel required to enter known or suspected areas of radioactive contamination and to personnel required to work

in or occupy contaminated areas. [V. Boyer, R. Kankus, R. Dubiel]

53. The distribution and use of potassium iodide (KI) for emergency workers is covered in Section 6.4.2.3 and further explained in response to NRC Question 810.53. As stated in EP-313, distribution of KI will be based upon expected or actual thyroid dose as calculated by the methodology provided in this procedure. Thus, distribution will be limited to specific emergency workers judged in need of treatment, which includes protection from an anticipated thyroid dose greater than pre-established levels. For example, there will be no need to provide KI to emergency workers in the Control Room or TSC inasmuch as these are habitable areas. [V. Boyer, R. Kankus, R. Dubiel]

Contention VIII-16(c)

54. 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 designated limits. Table 6-1 of the Emergency Plan contains emergency occupational exposure criteria applicable to all emergency personnel which may not be exceeded without express authorization from the Emergency Director. 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, i.e., EP-220 (Radiation Protection Team) and EP-250 (Personnel Safety Team). Such procedures contain an appendix which identifies each function for which authorization is required by the Emergency Director if a projected whole body dose or thyroid dose specified for that particular function is in excess of 10 C.F.R. Part 20 limits. [V. Boyer, R. Kankus, R. Dubiel]

55. 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. 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. [V. Boyer, R. Kankus, R. Dubiel]

56. As further stated in Section 6.5.1, these guidelines and knowledge of radiation effects allow onsite emergency response personnel to make informed decisions as to volunteering for the wide range of emergency actions (such as accident assessment and first aid) which might be initiated. Emergency workers, like all site personnel, will have had basic training in the biological effects of ionizing radiation. In addition to their emergency training for specific tasks, this will provide them with sufficient knowledge concerning radiation risks in order to make an informed decision. [V. Boyer, R. Kankus, G. Leitch, R. Dubiel]

Contention VIII-16(d)

57. Personnel monitoring required by 10 C.F.R. §20.202 is provided by the issuance of personnel dosimetry such as thermoluminescent dosimeters ("TLD's"), direct reading pocket dosimeters, or calculations from area survey data and exposure times. Exact procedures and equipment for personnel monitoring is described more fully in FSAR Section 12.5.2.2.4. Accordingly, all personnel entering the Radiologically Controlled Area of the Limerick facility will be issued such dosimetry. [V. Boyer, R. Kankus, R. Dubiel]

58. 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 Section 12.5.3.5.1, and thus will be able to read the self-reading pocket dosimetry. [V. Boyer, R. Kankus, R. Dubiel]

59. 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 Technical Support Center 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. 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 Section 12.5.2.2.4. [V. Boyer, R. Kankus, R. Dubiel]

60. Personnel exiting radiologically affected areas are also monitored for contamination by the use of friskers described in FSAR Section 12.5.3.4.2. If contamination is detected, the individual is sent to the decontamination facility in the Radwaste Enclosure or the Technical Support Center. [V. Boyer, R. Kankus, R. Dubiel]

61. As part of the screening process, a health physics technician would determine whether the contamination is in the area of the nose or mouth, or whether there is reason to believe that respiratory protection equipment may have failed. At that point, the individual would be directed to the whole body counting room in the TSC where bioassay is conducted as described in FSAR Section 12.5.2.2.6. [V. Boyer, R. Kankus, R. Dubiel]

62. 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. This procedure is consistent with existing health physics practices utilized during normal operating circumstances. [V. Boyer, R. Kankus, R. Dubiel]

63. As stated in Section 5.2.2.2.1.b, the Personnel Dosimetry Group, which is a subpart of the site health physics organizations, performs these same functions for personnel from offsite response organizations whose support may be required onsite. [V. Boyer, R. Kankus, R. Dubiel]

Contention VIII-16(g)

64. 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 facility in the Radwaste Enclosure or the TSC. Personnel from the health physics staff will be assigned to the decontamination station. Decontamination procedures are discussed in response to Contention VIII-15(d). [V. Boyer, R. Kankus, R. Dubiel]

Contention VIII-18

65. Emergency response training for offsite response organizations and support personnel is described in Section 8.1.1 of the Emergency Plan. Essentially, such training would be provided for fire companies, ambulance services, and local physicians. The specific initial training and periodic retraining provided for such personnel is described

in Table 8-1 of the Emergency Plan, Items 6 and 7. Training sessions will be conducted by seminar with lesson plans appropriate to their specific task. [V. Boyer, R. Kankus]

66. 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 organizations with the further orientation and General Employee Training provided to site personnel as described in FSAR Section 12.5.3.5. [V. Boyer, R. Kankus]

67. Additionally, training will be provided for support personnel who will be arriving onsite to respond to an emergency on an ad hoc basis. This training, which is provided pursuant to EP-307, would apply to personnel of other reactor licensees, vendors, utility organizations, and the like. It would be conducted on an expedited basis to permit such personnel to provide immediate onsite assistance. This procedure would not govern the training for firefighting, ambulance or medical personnel, or organizations with which the Applicant has a letter of agreement, which is separately described above. [V. Boyer, R. Kankus]

RELATED CORRESPONDENCE

DOCKETED
USNRC

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

'84 APR 23 A11:08

Before the Atomic Safety and Licensing Board

SECRETARY
DOCKETING & SERVICE
BRANCH

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

APPLICANT'S EXHIBITS RELATING TO
ONSITE EMERGENCY PLAN CONTENTIONS

Applicant's Ex. 32	Emergency Plan, Limerick Generating Station, Units 1 and 2 (through Rev. 8)
Applicant's Ex. 33	Emergency Plan Implementing Procedures, Limerick Generat- ing Station, EP-101 through EP-500
Applicant's Ex. 34	Revised Table 4-2 of the Emergency Plan
Applicant's Ex. 35	Emergency Procedure Corporate, EP-C-326
Applicant's Ex. 36	Emergency Procedure Corporate, EP-C-315
Applicant's Ex. 37	Surveillance Test Procedure ST-7-EPP-351-0, Limerick Generating Station
Applicant's Ex. 38	Final Safety Analysis Report, Limerick Generating Station, Sections 1.3 (page 1.13-18b), 2.1.2.3, 2.3.3, 2.3.3.2, 3.7.4, 7.5.1.4.2.1.5, 7.5.2.5.1.1.2, 7.6.1.1.6, 11.5, 11.5.2.2.1, 11.5.2.2.11, 11.5.2.3.1, 11.5.4, 11.5.5, 12.3.4, 12.5.2.2.4, 12.5.2.2.6, 12.5.3, 12.5.3.2,

12.5.3.4.2, 12.5.3.5,
12.5.3.5.1

- Applicant's Ex. 39 Environmental Report -
Operating License Stage,
Limerick Generating Station,
Section 6.1.5
- Applicant's Ex. 40 Letter of Agreement dated
August 16, 1983 between
Hospital of the University of
Pennsylvania and Radiation
Management Corporation
(including attached Radiation
Plan entitled "Decontamination
and Treatment of Radioactively
Contaminated Patient at
Hospital of the University of
Pennsylvania")
- Applicant's Ex. 41 Letter of Agreement dated
June 25, 1982 between Keystone
Helicopter Corporation and
Radiation Management Corpo-
ration
- Applicant's Ex. 42 Letter of Agreement dated
January 1, 1984 between
Radiation Management Corpo-
ration and Applicant
- Applicant's Ex. 43 Letter of Agreement dated
April 5, 1984 between
Pottstown Memorial Medical
Center and Applicant
- Applicant's Ex. 44 Letter of Agreement dated
April 2, 1984 between Linfield
Fire Company and Applicant
- Applicant's Ex. 45 Letter of Agreement dated
April 2, 1984 between Limerick
Fire Company and Applicant

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

APR 23 11:08

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of)
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Philadelphia Electric Company) Docket Nos. 50-352
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Units 1 and 2))

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicant's Testimony Relating to Onsite Emergency Plan Contentions," dated April 20, 1984 in the captioned matter have been served upon the following by deposit in the United States mail this 20th day of April, 1984:

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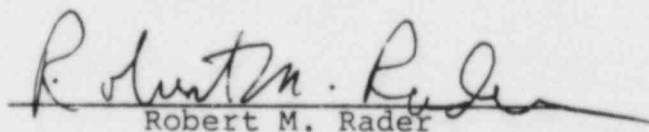
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