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NUCLEAR REGULATORY COMMISSION

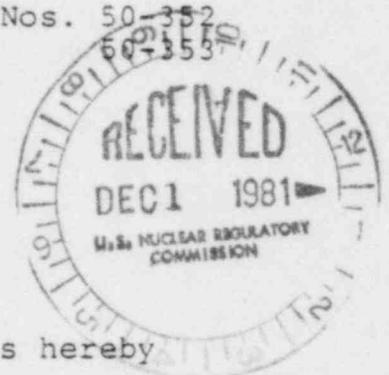
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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD.

*MS*  
SECRETARY  
SERVICE

In the Matter of :  
PHILADELPHIA ELECTRIC COMPANY :  
Limerick Generating Station, :  
Units 1 and 2 :

Docket Nos. 50-352  
60-353



SUPPLEMENTAL PETITION  
OF COORDINATED INTERVENORS

The following organizations and individuals hereby supplement their Petitions For Leave to Intervene, pursuant to 10 CFR §2.714(b) and in accordance with the Hearing Board's October 14, 1981 Memorandum And Order Setting Schedule For Submission of Contentions And Other Preliminary Information, as modified by its November 12, 1981 Memorandum And Order Adjusting Schedule And Clarifying Status of Limited Appearors:

- Air and Water Pollution Patrol and Frank R. Romano (ROMANO)
- Consumers Education and Protective Association (CEPA)
- Del-AWARE, Unlimited, Inc. (Del-AWARE)
- Friends of the Earth in the Delaware Valley, Robert L. Anthony and other named individuals (ANTHONY)
- Limerick Ecology Action (LEA)
- Keystone Alliance (KEYSTONE)
- National Lawyers Guild, Philadelphia Chapter (NLG)
- Marvin I. Lewis (LEWIS)
- William A. Lochstet (LOCHSTET)
- John Shniper (SHNIPER)
- Joseph H. White III (WHITE)
- Environmental Coalition on Nuclear Power (ECNP)

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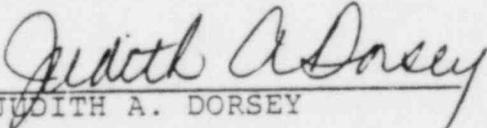
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To the extent possible, Intervenors have eliminated duplication of contentions by agreeing on the wording of a single contention and listing multiple Intervenors for that contention. In some cases it was not possible to do so because of the differences in scope of particular contentions.

Del-AWARE participated in coordination of contentions, and its contentions are included in this submission. Del-AWARE was also requested to submit legal arguments in support of its contentions. Those legal arguments, in the form of a legal brief, are being submitted under separate cover.

All Intervenors reserve the right to submit additional contentions throughout this proceeding, based on new information available to them at any point.

Respectfully submitted,

  
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CONTENTIONS

## I. TECHNICAL SAFETY ISSUES

## Probabilistic Risk Assessment

The Applicant's Probabilistic Risk Assessment (PRA), insofar as it is to be used by the Nuclear Regulatory Commission in determining whether the operation of the Limerick facility may constitute a disproportionate portion of the societal risk from nuclear power reactors, and thus constitutes an undue risk to the public due to its siting in a heavily populated area and to its proposed power level, is inadequate and deficient.

BASIS:

## I-1. Documentation deficiencies (LEA)

1. Fault trees, with very few exceptions, have been excluded from copies of the PRA made available to the public.
2. Some event trees have been removed, as evidenced by references to such trees in the original PRA (March, 1981 version) that are subsequently eliminated in the Amendment 26 revisions.
3. General Electric BWR data that support the reduction of safety significant maintenance unavailability are not provided.
4. Computer output for the WAMBAM, WAMCUT, INCOR and other computer model runs is not provided.

LEA requests access to this information, and reserves the right to submit additional contentions.

## Methodology deficiencies

## I-2. (KEYSTONE, LEA)

In comparing Limerick risks with WASH-1400 for both early deaths and latent cancer fatalities, insufficient justification is provided for comparing Limerick CCDFs using updated data and methodology, with WASH-1400 CCDFs using old data and methodology (rather than using either updated or old data and methodology for both).

## I-3. (LEA)

The "generic" BWR is in reality the Peach Bottom design, so that even if the WASH-1400 assessment were an adequate measure of risk for that design, it does not represent an appropriate surrogate from which to extrapolate total domestic BWR reactor risk.

## I-4. (LEA)

Some of the Limerick design credit is achieved by rethinking failure modes that would also apply to the generic BWR. Neither the risk that the ECCS will not function in the presence of a large LOCA nor the risk of pressure vessel failure is considered in the PRA. Whether these changes are considered design or data changes in the Limerick analysis is very unclear. They should not be viewed as design improvements since their rationale for exclusion has nothing to do with modifications between the WASH-1400 and Limerick designs. LEA disputes the appropriateness of their omission in view of the absence of full scale testing for LOCA functioning and the presence of fatigue and over pressure experience with pressure vessels.

## I-5. (LEA)

The Applicant has not justified the difference in core inventory and radiological source terms employed in the PRA and that employed in WASH-1400, especially with respect to the cesium particulates. Further, it is unclear whether, if justified, the Limerick core inventory should not now apply generically to BWR reactors, thus eliminating some of the credit in reduction of proportion of total societal risk claimed for Limerick.

## I-6. (LEA)

In some cases, the reason why Limerick as opposed to WASH-1400 data were selected for risk analysis is unclear, suggesting the possibility of selection based upon which data base contributed the lesser contribution to risk. For example:

- a. Limerick specific rainfall was not used while wind data were used, although higher rainfall could increase early fatalities. Limerick rainfall may be higher than rainfall for the WASH-1400 composite site.
- b. Undocumented GE maintainability data were used instead of the WASH-1400 data, which reduced unavailability by a factor of roughly 8.
- c. Tellurium release fractions were reduced by a factor of 5-10 from what was calculated, due to "apparent code error."
- d. The split between mechanical and electrical ATWS failure was made 30%/70% instead of 50%/50%, resulting in lower ATWS-contributed risk at Limerick.

Clarification of the rationale for why and under what circumstances

data sets were selected and applied should be required.

I-7. (LEA)

The scope of the fault tree model only extended down to the component level (e.g., pumps, valves, sensors); subcomponent parts are not separately treated. Thus, no subpart level common mode failures were considered.

I-8. (LEA)

Loss of grid power triggers reactor scram and if power is not recovered in a few hours, its absence poses a very great risk of core melt if concomitant with other possible safety system failures. In the PRA a PECO grid estimate of loss of power is made based upon observations for four cases of loss of power for durations of 2, 48, 90 and 315 minutes in duration. Based upon these four observations, a gamma distribution was estimated which predicted that the probability of the 350-minute (24 hour) outage was approximately  $.07(1 \times 10^{-8})$ . This gamma distribution has a monotonically declining hazard function. In reality, for repair situations like the loss of grid power, log normally distributed variants are used in aerospace with steadily increasing or peaking hazard function values. Thus the level of risk associated with loss of off-site power in the PRA is underestimated.

I-9. (LEA)

All accident initiators are considered only in mode F (full-power operation). Accidents that occur at less than full power and during refueling contribute to the total risk of facility operation, and should not be excluded.

## I-10. (LEA)

In the assessment of common mode failures, the PRA excludes from consideration layout specific common modes such as wiring runs, and the exigencies involved in quantifying the fault trees make perfect quantification of identified fault trees that have common mode implications very difficult and error prone.

## I-11. (LEA)

The exponential failure rate assumption for equipment aging is used throughout the PRA, thus effectively asserting that no equipment degradation over time will occur. This cannot be seriously asserted for many classes of equipment. The questions of how rapid the aging effect is and how much it increases risk must be addressed.

## I-12. (LEA)

No accounting is made for intentional or accidental errors such as the absence of "reinforcing bar" in the Trojan plant control room walls or the misplacing of pipe reinforcements in Diablo Canyon.

## I-13. (LEA)

The PRA does not consider the risk in the period between reactor hot shutdown and achievement of cold shutdown -- that is, the period after about 20 hours following the accident initiation and the end of 30 days. As acknowledged in the PRA, an area of large uncertainty is the method of bringing the reactor from hot shutdown to cold shutdown, not addressed in the analysis.

## I-14. (LEA)

The assumption is made that the engineers have designed the components of nuclear reactors to work at all times while under their spectrum of design environments. Unfortunately, not all combinations of potential design environments and failures can ever be anticipated, necessitating testing of designs. Realistic testing of safety performance following LOCAs or anticipated transients without scram have not been done for full sized reactors.

## I-15. (LEA)

WASH 1400 identified the potential for a PWR LOCA/Check Valve failure combination to markedly contribute to overall risk. The PRA modellers state that no case similar to the PWR interfacing LOCA condition has been "identified", suggesting the possibility of inadequate design review.

## I-16. (KEYSTONE)

Insufficient justification is given for the following inputs to CRAC code:

- a. maximum distance of evacuation
- b. time lag before evacuation
- c. angle of evaluated downwind sectors
- d. breathing rate
- e. release height - high
- f. release height - low
- g. isotopes
- h. acute health effects

- i. latent health effects
- j. spacial mesh description

## I-17. (LEA)

The very recent questions that have arisen regarding the previous atomic bomb response data suggest that the radiological consequences estimated in the CORRAL code are low. The new interpretation of the data necessitates rerunning the CORRAL code for Limerick in order to more realistically estimate the overall level of societal risk.

## I-18. (LEA)

Qualification requirements are not included in the variabilities incorporated into the component level failure probability quantification. Such exclusion improperly decreases the risk calculation for component level failures.

## I-19. (LEA, KEYSTONE)

Liquid pathways are not considered in the analysis of containment integrity because it is assumed that the molten core cannot breach the containment below the reactor. Data have not been supplied in the PRA sufficient to verify this assumption.

## I-20. (KEYSTONE)

Adequate justification for the shielding factors for assessment of health effects has not been provided.

## I-21. (LEA)

No consideration is given to increased risk that may occur due to operation of Unit 1 during completion of construction of Unit 2. The TVA Browns Ferry fire was started by actions associated with construction of a second reactor.

## I-22. (LEA)

No justification is offered in the PRA for the decision to ignore interactions between the two Limerick units once they are both in operation. There is no discussion of whether there is a risk that an accident in one unit could impact the other because of common structures and components; whether there are common-mode or common-event failures that could impact both units simultaneously; or whether the common control room could cause such "double" impacts.

## I-23. (LEA, KEYSTONE)

The PRA excludes consideration of such external initiators of accidents as fires, earthquakes, floods, severe weather conditions, sabotage and some types of operator error.

a. Sabotage, either during construction or during operation represents a real risk (sabotage recently occurred at Beaver Valley) and must be considered. Fires may be external initiators or consequences of accidents that can magnify the original accident. Fires are a primary cause of common-mode failures.

b. Operator actions which defeat system performance or which aggravate the achievement or

maintenance of stable hot shutdown are generally not evaluated. Just such actions contributed to the TMI accident. Furthermore the PRA relies on observation of procedures, ignoring willful violations. (Such violations have resulted in fines at operating reactors.) A strong financial incentive exists for continued operation while a dormant safety system is unavailable--the difference in marginal costs between running a plant the size of Limerick and using oil-fired generation during shutdown is on the order of \$1.7 million per day.

c. There is insufficient justification in the PRA for exclusion of floods, severe weather conditions and earthquakes as external initiators.

I.24. (LEA)

The PRA does not consider the economic consequences of postulated accidents. Totally ignored are medical costs associated with health effects and costs associated with contamination of land and water--property losses, lost business, lost agricultural productivity, cleanup costs, costs of alternate water supplies, etc.

I-25.

Inadequate site-specific data were used unnecessarily.

a. (LEA, KEYSTONE)

1970 population data are used in the PRA.

1980 census data along with projections over the

life of the facility would provide a bounding range of population figures to be factored into the consequence analysis, and should be used.

b. (LEA)

Use of only five years of meteorological data does not provide either the full range of expected weather conditions or the historical distribution of these conditions throughout the year.

I-26. (LEA)

The use of an average evacuation rate of travel in WASH-1400 has been widely attacked as inadequate in evaluating evacuation as a radiological emergency response. (E.g., NUREG/CR-1131.) Applicant appears to have used the same model as a basis for its Ex-Plant Consequence Model, in spite of its inadequacy. Predictions of health effects depend on the assumptions in the evacuation model. The Applicant's own evacuation time estimates (once they are corrected--see emergency planning contentions) should be used for these calculations.

I-27. (KEYSTONE)

a. Use of WASH-1400 evacuation time estimate should be justified in light of higher population densities at Limerick.

b. Evacuation time estimate for 10-25 miles should be justified in light of the fact that there is no plan for evacuation beyond a 10

mile radius, in the event of an accident. Health effects consequences are underestimated because the PRA assumes evacuation out to 25 miles, and evacuation is only planned for out to 10 miles.

I-28. (KEYSTONE)

Insufficient justification is given for rejection of the "hot spot" theory and others concerning dose-health effect relationships.

I-29. (LEA, KEYSTONE)

The health effects models used in WASH-1400 were also used in the Limerick PRA. Recent Hiroshima/Nagasaki data should be used for a more accurate assessment of health risks.

I-30 (LEA)

The PRA considers only two types of health effects as a measure of the total consequences of accidents, namely, early fatalities (caused by acute over-exposure to radiation) and latent cancer fatalities. Impacts that are ignored include birth defects occurring over several generations, nonfatal cancers, including thyroid tumors, and sterility.

I-31. (KEYSTONE)

Justification is not provided for the assumption that large-scale medical treatment will be available to people exposed to radiation. The assumption is used to reduce the early health effects calculation.

I-32. (LEA)

In light of the criticisms of WASH-1400, detailed peer review of the Limerick PRA should be required, including either separate running of the codes or detailed review of inputs and outputs of the existing code runs. Particular attention needs to be given to the treatment of common modes, the modeling of the core physics, and the selection of Limerick specific data.

(end of PRA contentions)

## I-33. (LEA)

Applicant has failed to adequately address certain of the TMI Action Plan requirements of NUREG-0737; individually and cumulatively these issues represent an increased, unacceptable risk for operation of Limerick.

- A. Item I.B.1.2 requires the establishment of an independent safety engineering group to perform independent reviews of plant operation. PECO has not indicated an intent to comply with this requirement.

BASIS: NUREG-0737, Item I.B.1.2; FSAR §1.13.2.

- B. Applicant has failed to provide responses (other than "later") to the following Action Plan requirements:

I.C.6

II.K.3.13, 15, 16, 18, 21, 22, 24,  
25, 27, 28, 30, 31, 44, 45

BASIS: NUREG-0737, items listed above;  
FSAR §1.13.2.

- C. Item I.C.1 of the Action Plan has been inadequately addressed. Proper "evaluation and development of procedures for transients and accidents" is critical to the safe operation of Limerick, given the significant contribution of inadequate procedures and training to the accident at Three Mile Island.

BASIS: NUREG-0737, Item I.C.1; FSAR §1.13.2.

- D. Applicant's response to Action Plan Item I.G.1 is inadequate. Applicant has not submitted a proposal describing its low power test program for review by the NRC, and does not indicate any intention to do so, in spite of the requirement.

BASIS: NUREG-0737, Item I.G.1; FSAR §1.13.2.

- E. Applicant has not performed a control room design review (Item I.D.1), a radiation shielding design review (Item II.B.2), or a review of systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident (leakage inspection program) (Item III.D.1.1). Thoroughness of these reviews is critical to the prevention of exacerbation of accidents at Limerick, and LEA reserves the right to review Applicant's submissions, and to submit new contentions if appropriate. Applicant's control room design review should be carried out in conformance with the guidelines of NUREG-0700.

BASIS: NUREG-0737, Items I.D.1, II.B.2, and III.D.1.1; NUREG-0700; FSAR §1.13.2.

- F. Item II.D.3, Direct Indication of Relief and Safety-Valve Position, requires that a human-factor analysis be performed in

order to assure that the newly required displays and controls added to the control room not increase the potential for operator error. While Applicant's response to Item II.D.3 addresses the other specified requirements, it totally omits discussion of this requirement. Human factors played a large part in the accident at TMI, and it must be addressed at Limerick in order to decrease the potential for causing or exacerbating transients and accidents.

Applicant has not met the documentation requirements of Item II.D.3. These requirements must be met no less than 4 months prior to the scheduled issuance of the staff safety evaluation report.

BASIS: NUREG-0737, Item II.D.3; FSAR §1.13.2.

- G. Applicant's response to Item II.E.4.1 states that "the existing reactor vessel level indication in the control room is not safety grade." The response goes on to say that additional level indication will be provided that meets the "intent" of Regulatory Guide 1.97, Rev. 2. Petitioner contends that Applicant should meet the "requirements" of Reg. Guide 1.97, Rev. 2, unless explicit

justification for a failure to do so is provided. Without such justification, Applicant's design does not comply with GDC 13.

BASIS: NUREG-0737, Item II.4.1; FSAR §1.13.2; Reg. Guide 1.97, Rev. 2; 10 CFR Part 50, App. A, GDC 13.

- H. Item II.F.2 requires that each plant have instrumentation that will provide an unambiguous, easy-to-interpret indication of inadequate core cooling. The accident at Three Mile Island highlighted the need for such instrumentation. The design of Limerick does not include the use of in-core thermocouples for detection of inadequate core cooling, and the Applicant has indicated that it does not intend to install them. Rather, it will rely on its existing reactor water level instrumentation, which does not give a direct indication of core cooling and core temperature. Furthermore, Applicant has not yet provided a response to Item II.K.3.27, which is directed at operator confusion concerning reactor vessel water level instruments. (See B., above.) To aggravate the problem, the reactor vessel level indication in the control room is not

safety grade. (See G., above.) Applicant's design does not comply with Item II.F.2 of the Action Plan or with GDC 13.

BASIS: NUREG-0737, Item II.F.2; FSAR §1.13.2; 10 CFR Part 50, App. A, GDC 13.

- I. Item II.D.1, requirements for Performance Testing of Reactor Relief and Safety-Valves, is being analyzed by the BWR Owners Groups for its applicability to Limerick, in spite of the fact that the Action Plan explicitly states that II.D.1 is applicable to all operating license applicants. Without appropriate testing of these valves and verification of their capability, the applicant cannot demonstrate compliance with GDC's 1, 14, 15 and 30, thereby endangering the public health and safety. LEA reserves the right to review the BWR Owners Group report, and to submit contentions if appropriate.

BASIS: NUREG-0737, Item II.D.1; FSAR §1.13.2.

- J. Requirements under Item III.A.1.2, Upgrade Emergency Support Facilities, have been updated since the September 5, 1980 requirements relied upon by the Applicant. The February 18, 1981 (Generic Letter 81-10) letter to all licensees and holders of construction permits and NUREG-0696, Functional

Criteria for Emergency Response Facilities (March 5, 1981 Generic Letter 17), supercede the September 5, 1980 requirements. Applicant should be required to comply with these new requirements or to justify noncompliance.

BASIS: NUREG-0737, Item III.A.1.2; Generic Letter 81-10; Generic Letter 17; NUREG-0696; FSAR §1.13.2.

- K. In response to Item I.D.2, requiring a Plant Safety Parameter Display Console, "to mitigate nuclear reactor abnormal situations", Applicant states that it is awaiting guidance from the NRC. The functional criteria for this facility are now described in NUREG-0696, Functional Criteria for Emergency Response Facilities. Applicant should be required to comply with these new requirements or to justify noncompliance.

BASIS: NUREG-0737, Item I.D.2; NUREG-0696; FSAR §1.13.2.

- L. Item III.D.3.4 requires that criteria of Section 6.4 of the Standard Review Plan be met. The control room habitability systems at Limerick are designed to meet the requirements of GDC 19, 10 CFR Part 50, App. A. The Standard Review Plan states that system

design is acceptable if the requirements of GDC 4, 5 and 19 are met. Applicant should be required to show compliance with GDC 4, Environmental Missile Design Bases, and (since it has a common control room) GDC 5, Sharing of Structures, Systems and Components (as it relates to facilities which have a single control room for more than one nuclear power unit and with respect to ensuring that such sharing will not significantly impair the ability to perform safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining unit), or to justify noncompliance.

BASIS: FSAR §6.4; NUREG-0737, Item III.D.3.4.

## Accident Monitoring/Sampling

I-34. (LEA)

Applicant has neither shown compliance with revision 2 of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident", nor provided justification for noncompliance. Therefore Applicant has not demonstrated that it meets the requirement of GDC 13, 19 and 64. Adequate accident monitoring and sampling capabilities are needed to be able to promptly initiate protective actions for the abnormally large population surrounding Limerick. Given the difficulties inherent in carrying out protective actions for large populations, it is especially critical at Limerick that accident monitoring be as immediate, accurate and comprehensive as is technologically feasible.

BASIS: Regulatory Guide 1.97, Revision 2.

I-35. (LEA)

The interference of both off-line and in-line radiation monitoring systems by high background radiation levels (FSAR §11.5.1.1(j)) and the declining capability of the primary containment leak detection monitor as radioactivity accumulates in the containment atmosphere from identified sources (FSAR §11.5.2.2.8), are unacceptable.

BASIS: FSAR §§11.5.

I-36. (LEA)

North Stack noble gas effluent monitors are alleged by

Applicant to meet the requirements of draft 3 of Reg. Guide 1.97, Rev. 2. Applicant should be required to review these monitors and other aspects of its accident monitoring system to determine the degree of compliance with the final version of Reg. Guide 1.97, if those requirements differ in any way from draft 3.

BASIS: FSAR §11.5.

I-37. (LEA)

Applicant's response to NUREG-0737, Item II.F.1, Accident Monitoring, totally omits mention of the requirement for (or Applicant's noncompliance with) a human factors analysis of the control room as it might be affected by the requirements of Item II.F.1.

BASIS: NUREG-0737, Item II.F.1.

I-38. (LEA)

Applicant's response to Item II.B.3, Postaccident Sampling Capability, indicates that DBA-LOCA is the envelope accident sequence event used to provide a demonstration of Limerick's post-accident sampling capabilities. Three Mile Island showed that DBA-LOCA is not a sufficient standard against which to measure the adequacy of any safety-related systems. Limerick's post-accident sampling capability should be based on an envelope accident sequence beyond design basis accidents, in order to assure adequate protection of health and safety of the large population in the vicinity of Limerick.

BASIS: NUREG-0737, Item III.B.3; FSAR §§1.13.2 and 7.5.1.4.2.

(end of monitoring contentions)

I-39. (LEA)

Pipe storage practices by the Applicant deviate from 10 CFR 50 Appendix B, Criterion 13 and Regulatory Guide 1.38. Pipe stored under Applicant's pipe storage practices may not perform satisfactorily in service due to deleterious pipe corrosion during storage (including both general corrosion and localized pitting), introduction of harmful substances into the pipe during storage, and failure to remove unacceptable foreign material during subsequent cleaning operations prior to use. Disagreement between the NRC and Applicant concerning Applicant's pipe storage practice remains unresolved in spite of attempts to do so. Meanwhile, pipe that has already been installed may have to be replaced or otherwise qualified for use, as may pipe that is presently being stored according to the storage practice at issue.

Operation of the Limerick Generating plants without a satisfactory investigation and resolution of this matter will put the health and safety of the public in serious jeopardy.

BASIS: Correspondence in Docket Nos. 50-352 and 50-353, namely, the July 8, 1981 Memorandum and six supporting references from A. Schwencer, Chief, LB #2, DL, to Stefan S. Pawlicki, Chief, Materials Engineering Branch of NRC.

I-40. (LEA)

The need for documentation of deviations--documentation to show where the design, structures and components of a nuclear power plant do not conform to current regulatory practices

(i.e., Regulatory Guides, Branch Technical Positions and Standard Review Plans) and the basis for and acceptability of those deviations--has been acknowledged by the Nuclear Regulatory Commission. Absent such documentation, there is no basis for any Board finding that a level of safety equivalent to current regulatory practices does in fact exist as required by 10 CFR §§50.34(b), 50.57, and 50.109.

The Limerick FSAR contains no comprehensive documentation of deviations that would permit the Board to make a finding of safety equivalent to current regulatory practices. Section 1.8, Conformance to Regulatory Guides, addresses only a small number of Guides. Some individual chapters in the FSAR contain a section on conformance with Guides related to those chapters. In other chapters, conformance is addressed within each section of the chapter. This array of methods for addressing documentation of deviations makes it impossible for NRC staff to review the deviations in any comprehensive way.

Furthermore, whether or not Limerick conforms to a Regulatory Guide is often not directly stated. Rather, the issue of conformance is evaded by the use of such terms as "evaluated to be in conformance with the intent ..." and "in conformance subject to clarification." When nonconformance is admitted, justification for nonconformance is often omitted.

The Limerick FSAR should contain a comprehensive, non-evasive documentation of deviations, including justifications for nonconformance, that will permit NRC staff and others

reviewing the FSAR to determine whether or not it is in conformance with Regulatory Guides and other regulatory practices.

BASIS: FSAR § .8; 10 CFR §§50.34(b), 50.57,  
50.109.

I-41. (LEA)

#### Exacerbation of accidents

(a) The TMI accident showed how non-safety systems can interact with safety systems to cause or exacerbate an accident. Systems Interaction is the subject of an unresolved safety issue (A-17). A systems interaction analysis can reveal actions and consequences that could adversely affect the presumed redundancy and independence of safety systems. The TMI Action Plan (NUREG-0660, Item II.C.3) describes some possible approaches for analysis of systems interaction. A systems interaction analysis must be done at Limerick in order to assure that necessary interactions, failure combinations and accident sequences have been considered in assessing the ability of the Limerick design to meet the safety criteria of 10 CFR Part 50.

(b) The effects of control system failures on anticipated operational occurrences, accidents and operator actions are all the subjects of concern within the new unresolved safety issue A-47, Safety Implications of Control Systems. Plant specific review is required to discover the potential for an accident that would affect a particular control system and the effects of that control system failure. Such a review must be done at Limerick in order to assure that the

design of the [redacted] meets the safety criteria of 10 CFR Part 50.

BASIS: Nuclear Regulatory Commission  
Annual Report, Chapter 4; NUREG-0609, Vol. 3, Nos. 2 and 3, Unresolved Safety Issues Summary (Aqua Book); NUREG-0705, Identification of New Unresolved Safety Issues Relating to Nuclear Power Plants; TMI Action Plan, NUREG-0660, Item II.C.3.

I-42. (LEA)

NUREG-0588 contains the NRC's current requirements regarding previously unresolved safety issue A-24, Environmental Qualification of Safety Related Electrical Equipment. Safety related electrical equipment must be qualified to perform its function in the environment associated with accidents. It must also be able to perform its function throughout the life of the plant--to resist the deleterious effects of aging.

Applicant has stated that it intends to evaluate the requirements of NUREG-0588 at some point in the future, and that it will submit an equipment qualification report to the NRC at least four months prior to receiving its operating license.

LEA contends that environmental qualification of safety related electrical equipment is critical to the safe operation of Limerick, and that such lengthy postponement of resolution of this matter will inevitably mean application of a lesser safety standard to Limerick than is required or should be permitted. The ability to backfit the Limerick facility to correct defects discovered at such a late date in construction

could be severely limited, technically and financially, with the result that such backfitting will not be required, causing increased risk of public health and safety.

BASIS: U.S. Nuclear Regulatory Commission 1980 Annual Report, Chapter 4; NUREG-0588, Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment; Memorandum and Order CLI-80-21, requiring conformance to NUREG-0588 and Reg. Guide 1.89; July 6, 1981, Acceptance Review of Application for Operating Licenses for Limerick Generating Station, Units 1 and 2, Enclosure 5 (Supplemental Request for Additional Information); Applicant response to Enclosure 5, id., Amendment 26; FSAR, SRAI(1)-1; 10 CFR §50.109 (Backfitting).

I-43. (LEA)

Applicant has not adequately addressed staff resolutions of Unresolved Safety Issues A-8 and A-39, Mark II Pressure Suppression Containments. Specifically:

- A. Resolution of A-8, Mark II Containment Pool Dynamic Loads-Long Term Program, is provided in NUREG-0808, Mark II Containment Program Load Evaluation and Acceptance Criteria. NUREG-0808 contains a list of identified LOCA-related pool dynamic loads and the load specifications that the NRC staff finds acceptable. Applicant has neither addressed these load specifications for Limerick nor justified a substitute approach for resolving this safety issue, and therefore has not shown compliance with

GDC 16.

BASIS: NUREG-0808; NUREG-0606, Vol. 3, Nos. 2 and 3; 10 CFR Part 50, App. A, GDC 16; FSAR §1.12.4.

- B. Partial resolution of USI A-39, Determination of SRV Pool Dynamic Loads and Temperature Limits for BWR Containment, is provided in NUREG-0763. Applicant has neither documented a plant-specific SRV inplant test program nor provided justification for electing not to perform such inplant testing, as required by NUREG-0763. Applicant has therefore not shown that Limerick meets the requirements of GDC 16 and 29. Applicant should also be required to address the pool-temperature-limit evaluation and acceptance criteria of NUREG-0783, which has been prepared but not yet released, when the document becomes available.

BASIS: NUREG-0763; NUREG-0783; NUREG-0606, Vol. 3, Nos. 2 and 3; 10 CFR Part 50, App. A, GDC 16, 29; FSAR §1.12.4.

I-44. (LEA)

Unresolved Safety Issue A-43, Containment Emergency Sump Performance, has not been addressed in the FSAR, because, according to the Applicant, A-43 does not apply to Limerick (see Table 1.12-1, LGS FSAR). USI A-24 does apply to Limerick, and should be addressed by the Applicant.

BASIS: NUREG-0606, Vol. 3, Nos. 2 and 3, USI A-43, state that "concerns relative to debris, blockage,

and hydraulic performance also apply to boiling water reactors during recirculation from the suppression pools."

I-45. (LEA)

Applicant has committed itself to the alternate 3A requirements described in Volume 4 (for comment) of NUREG-0460, Anticipated Transient Without Scram for Light Water Reactors. In light of the significant safety hazards connected with this unresolved safety issue, Applicant should be required to maintain that commitment even if the final version of the 3A requirements is less strict, and to agree to comply with any more stringent requirements that may appear in the final version of NUREG-0460, Volume 4.

BASIS: NUREG-0460, Volume 4 (for comment);  
FSAR §1.12.5.

I-46. (LEA)

Applicant has not shown that it has resolved USI A-10, BWR Nozzle Cracking, for Limerick. NUREG-0619, the NRC staff's resolution of this USI, has not been adequately addressed by the Applicant. The statement that "improved nozzle and system designs, inspection techniques, and operating procedures have been developed" is evasive. Applicant should be required to state clearly what steps have been taken to address this important safety issue at Limerick, and to justify any noncompliance with NUREG-0619.

BASIS: NUREG-0619; FSAR §1.12.6.

## I-47. (LOCHSTET)

Each of the plants at Limerick is being built with one High Pressure Coolant Injection (HPCI) pump in the Emergency core Cooling System (ECCS). There should be three HPCI pumps each arranged so as to inject into a separate core spray loop.

BASIS: A second HPCI pump would provide redundancy of protection in the event of failure of the HPCI pump, or some other component. In the event of a pipe break in one of the pipes to which the HPCI injects, such injection would be useless. Thus the use of diverse injection piping would provide additional protection for this possibility. A third HPCI pump would provide an additional redundancy to the system. This redundancy is necessary due to the high population in the vicinity of Limerick.

There is a range of size of pipe break that may not be responded to adequately by the present one-HPCI system. In particular, take note of the statement of p. 6.5-21 of the PSAR. A second and third HPCI pump would triple the HPCI capacity for most cases, and provide a smaller range of breaks that could not be responded to adequately. It should be noted from WASH-1400 that small breaks are more probable than large ones. This was also learned at TMI.

## I-48. (LOCHSTET)

The technical specifications for the Limerick plants permit operation with one HPCI pump down for maintenance. Full power operation should not be allowed unless three pumps are operable. If one or more HPCI pumps are inoperable,

operation should be permitted only at reduced power levels.

**BASIS:** This contention is linked to contention I-47. The added protection provided by additional HPCI equipment is useless unless the equipment is operable. If some of the equipment is unavailable to provide this protection, it should be provided by operation at reduced power. Allowable power with two systems inoperable should be less than with one inoperable. No power production should be permitted with all HPCI systems inoperable.

As before, this requirement is mandated by the unusually high population in the plant vicinity.

I-49. (LEWIS)

An Electromagnetic Pulse (EMP), generated by an accidental explosion of one of our own nuclear devices at high altitude, would destroy or disrupt controls within Limerick that are important to safety, thereby threatening the health and safety of the public.

**BASIS:** EMP will cause many devices based on transistors and microchips to fail. (Energy, Vulnerability and War. FEMA 1980.) The chance of an accidental explosion of a nuclear device at high altitude is real and immediate. (Are We Safe From Our Own Nuclear Weapons? Jack Anderson, Parade Magazine, The Bulletin, Oct. 18, 1981.) The relationship of the failure of transistor devices, EMP and the chance of an accidental nuclear explosion has been investigated and reported. [Science Magazine, June 5 (p. 1116), June 12 (p. 1248), 1981; Science News, May 9 (p. 300), May 16 (P. 314), and June 6 (p. 359), 1981; "The Chance for a Goof with Nuclear Weapons Is High," Phila. Inquirer, July 17, 1981 (p. 5A).]

EMP from a nuclear device will cause a common mode failure in transistorized, safety-related systems at Limerick, which is a violation of the single failure criterion, 10 CFR Part 50, App. K, 10 CFR §50.55, and IEEE Std 279. Also see Case to Commissioners SECY 77 439, Aug. 17, 1977.

I-50. (LEWIS)

Casks for shipping spent fuel are not safe. The inspection program for casks is inadequate. Casks are not adequately insured, and are not designed properly to withstand fire.

BASIS: The Waste Paper, Sierra Club, Vol. 3, No. 3)

I-51. (LEWIS)

Limerick does not meet the General Design Requirements of 10 CFR Part 50, App. A, because the Mark II containment design, which is the design of Limerick, would be breached if about 10% of the fuel cladding reacted to produce hydrogen.

BASIS: Letter, Mattson to Lewis, July 29, 1981. An accident where over 10% of the cladding reacted has already occurred -- in the hydrogen spike incident at Three Mile Island.

I-52. (LEWIS)

The design of Limerick threatens the health and safety of the public because of the seismic separation gaps that have been found at Limerick.

BASIS: Seismic Separation Gaps At Limerick, .AITS F 12188H1. Bauer to Reinmuth NRC, Feb. 2, 1980.

I-53. (ANTHONY)

The generic issue of fuel cladding has not been resolved at Limerick. An accident is waiting to happen.

BASIS: One of the continuing unresolved generic issues

is fuel cladding. Table 1.6-1 of the FSAR refers to GE reports. GEAP-13112 (section 4.2 of the FSAR) is on zircaloy cladding "response under loss-of-coolant conditions." This report was dated April, 1971. Report NEDO 10173 (section 11.1 of the FSAR) is dated May, 1970, and concerns "current state of knowledge, BWR Zircaloy-clad UO<sub>2</sub> Fuel." Both of these reports, obviously, predate the TMI accident and the findings connected with it.

Some of the findings concerning zircaloy cladding were published in a report by Dr. Daniel M. Pisello, N.Y. University, in The Ecologist, Vol. 9, Nos. 4/5, Aug. 1979, pp. 116-118. His conclusions question the use of zircaloy both for its failure under loss-of-coolant emergencies, and its instability under conditions of spent fuel storage.

The Limerick plant should not be allowed to operate without further study of zircaloy's potential failures.

I-54. (ANTHONY)

The FSAR is incomplete without a summary of operating experience with GE reactors. This would include the malfunctioning of equipment and all the causes of reactor tripping and the failure or breakdown of any equipment under operating conditions.

BASIS: Without this information it is not possible to tell whether safeguards against such malfunctioning parts or failures has been provided for in the Limerick construction by the Applicant.

I-55. (LEA)

Scram Discharge Volume

A. The Browns Ferry Unit 3 partial scram failure of June 28, 1980, showed that the BWR scram system is unreliable, in that a failure to scram can arise from an undetected accumulation of water in the scram discharge volume due to design deficiencies. Design changes are necessary to reduce the unreliability of the BWR scram system at Limerick and the associated risk to the health and safety of the public.

BASIS: July 30, 1980 AEOD Report on the Browns Ferry Partial Failure to Scram Event on June 28, 1980; August 8, 1980 Memorandum from ACRS Task Force to Dr. Milton S. Plesset, Chairman, Subcommittee on Fluid Dynamics, entitled A Review of Recent Malfunctions of BWR Scram System; FSAR §7.2.1.1.4.2.

B. On April 30, 1981, the NRC requested plant-specific information regarding integrity of BWR scram system piping--specifically, an evaluation of the applicability to Limerick of GE's generic evaluation of the problem, an evaluation of Limerick's conformance with certain general design criteria and regulations, and a demonstration that a break in Limerick's SDV system meets 10 CFR §50.46. LEA reserves the right to review these submissions when they are available, and to submit additional contentions if necessary.

BASIS: April 30, 1981 letter from R.L. Tedesco to E.G. Bauer, Jr., "Safety Concerns Associated With Pipe Breaks in the BWR Scram System."

I-56. (LEWIS)

The design of the Limerick nuclear power plants is not adequate to protect the health and safety of the public.

BASIS: The dangerous design of the BWR system is de-

scribed in NRC documents as follows: "The closure principle and design arrangement of these valves do not meet the important requirements for isolation valves described in GDC 54 and 55 of Appendix A to 10 CFR 50...Potentially less than adequate human factor preparation has been provided, given the importance to safety of isolating a break in the SDV (scram discharge volume) system...The current plant emergency operating procedures do not adequately address the potentially concurrent need to maintaining the core covered and protecting against the loss of ECCS equipment due to adverse environmental conditions including flooding...Failure to isolate a SDV system break raises serious questions regarding the assurance of long term decay heat removal with emergency core cooling system since the break itself potentially threatens operation of this equipment." NUREG-0785, Safety Concerns Associated With Pipe Breaks in the BWR Scram Discharge System. May, 1981.

I-57. (LEWIS)

There is an insufficient inventory of water on site or in the borated water storage system to provide adequate assurance of cooling in the case of an SDV pipe break.

BASIS: The water situation at the Limerick nuclear power plants is a unique situation. The plant will operate in a "river follower" mode. Water in many instances must be piped over distances of many miles before it is available for use at the plant. The river system must be at a certain level for the plant to be allowed to take water from the rivers.

This river follower mode makes the plant highly dependent upon the onsite storage of water. The onsite storage is limited

to a spray pond. Further, the spray pond water would have to be borated before use in a reactor experiencing an SDV pipe break. This boration takes time and increases the chance of errors.

All of the above leaves the plant very or exclusively dependent upon the borated water storage. This dependence is a unique feature of the Limerick plant due to its river follower mode of operation, long transit distance for its water supply, and limited onsite storage of water.

Limited time for operator action is pointed out in NUREG-0803, pp. 4-10:

Under the NRC postulated scenario, operator action must take place within a limited time frame to prevent the potential loss of blowdown capability, minimize (water) inventory loss, and minimize radioactivity release to the containment environment.

Both GE and the NRC refer to minimizing the loss of water inventory. However, they both look at this SDV generically. The lack of water inventory is a unique aspect of the Limerick plants that has not been addressed. "GE Evaluation in Response to NRC Request Regarding BWR Scram System Pipe Breaks," NEDO 24342, April 1981; NUREG-0803, Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping, Aug., 1981.

I-58. (KEYSTONE, CEPA)

The population density in the vicinity of Limerick exceeds the standards currently recommended by the NRC for siting of nuclear power plants. Therefore Limerick should not be granted an operating license.

I-59. (LEA)

The NRC currently has no technical justification for setting the "design basis accident." Probabilities of accidents are not known and thus there is no rational basis for deciding what the design basis should be. Until the NRC can justify its choice of the design basis, there is no rational method for finding that a nuclear power plant does not represent an undue risk to the health and safety of the public, and the Limerick operating license should be denied.

BASIS: NRC staff testimony in TMI I Restart proceedings.

I-60. (LEA)

Applicant has not provided adequate means to control the release of radioactive materials in gaseous and liquid effluents from the Limerick Generating Station, as required by GDC 60. GDC 60 and 10 CFR §100.10 require special precautions to be taken to prevent escape of radionuclides where unfavorable site characteristics exist.

(a) The Limerick site is one that, since the accident at TMI, is acknowledged to be a highly unfavorable one because of the large population density in the vicinity and the proposed power levels. Population within a 10-mile radius of the site was 150,000 as of 1970 and is projected to be 220,000 by the year 2000. 1970 census data showed a population of over

7,000,000 within a 50-mile radius, estimated to reach 10,000,000 by the year 2000. These extremely high population figures mean that should a serious accident and concomitant release of gaseous radioactivity occur at Limerick, the health consequences will be enormous. Additional compensating engineering safeguards such as filtered vented containment should be required to reduce the risk of such gaseous releases.

(b) Philadelphia pumps 100% of its water, used for drinking water and other human uses, from surface water -- the Schuylkill and Delaware Rivers. Petitioner contends that it will be impossible to protect these surface waters, and therefore the domestic water supplies for the city of Philadelphia and other municipalities that obtain their water from surface waters, should significant gaseous releases from Limerick occur. Therefore additional compensating engineering safeguards such as filtered vented containment should be required to prevent such gaseous releases.

(c) Forty percent of Philadelphia's water is pumped from the Schuylkill River at points downstream from Limerick. The plant sits on the banks of the river and normal liquid effluents from operation will be discharged into the river. Accidental releases of large quantities of radioactive liquids (as occurred at TMI) will directly and immediately threaten the health and safety of Philadelphia residents through their water supplies. The same will be true of other municipalities along the river. Compensating engineering safeguards to prevent

accidental liquid effluent releases into the Schuylkill River should be required.

(d) Groundwater underneath the Limerick site flows to the southwest, into the Schuylkill River. An accident resulting in core meltdown and contamination of groundwater would eventually cause massive contamination of the river, which is the source of domestic water supplies for Philadelphia and other municipalities downstream of Limerick. Molten core retention devices and groundwater interdiction measures should be required to prevent contamination of groundwater.

BASIS: 10 CFR Part 50, Appendix A, GDC 60; 10 CFR §100.10; FSAR §§ 2.4.5 and 2.4.10.2.4; Feb. 25, 1980 Engineering Report, City of Philadelphia Water Department (Water and Sewer Revenue Bonds Sixth Series); April 30, 1980 Memorandum for Harold R. Denton, Director, Office of NRR, from Brian K. Grimes, Program Director, Emergency Preparedness Program Office.

I-61. (LEA)

Applicant has not demonstrated compliance with GDC 3, Fire Protection. On July 6, 1981, in the NRC's Acceptance Review of the Applicant's OL application, the Applicant was directed to the current requirements for fire protection programs in the new Appendix R of 10 CFR Part 50 and sample questions appropriate to an evaluation of the plan. Applicant responded that the results of its evaluation would be available in the second quarter of 1982. Petitioner reserves the right to review new submissions concerning Applicant's fire protection plan, and to submit additional contentions.

BASIS: July 6, 1981 Acceptance Review of Application for Operating Licenses for Limerick Generating Station, Units 1 and 2, Enclosure 5; Amendment 26, FSAR, SRAI(4)-1; October 15, 1981 Letter from Eisenhut to Bauer, re Fire Protection Rule.

I-62. (LEWIS)

The Limerick nuclear power plant can suffer a major breach of containment due to pressurized thermal shock. Breach of containment can be a Class 9 accident.

BASIS: Pressurized thermal shock is a condition which results from the introduction of cold water into a hot, pressurized reactor vessel. The NRC has not investigated boiling water reactors, such as Limerick, for pressurized thermal shock. The NRC has and is investigating pressurized water reactors for thermal shock, and that investigation has borne fruit. The NRC has admitted that several PWRs will have to shut down shortly unless some measures are taken to mitigate the effects of pressurized thermal shock. (Letter, Bernero to Lewis, Aug. 28, 1981.)

The NRC has been remiss in its duties in that it has not investigated pressurized thermal shock in BWRs. Due to the paucity of information, the danger of pressurized thermal shock at Limerick is not known. This lack of information must be corrected, and the danger of pressurized thermal shock at Limerick quantified before an OL is granted.

I-63. (LEA)

The source of cooling water for Limerick has not yet been established. Until this issue is resolved, no operating license should be granted.

## II. NEED FOR POWER

## II-1. (CEPA, KEYSTONE)

Limerick generating capacity is not needed, and there are alternatives that are more reliable, economical, and less harmful to the environment.

BASIS:

1. PECO has made numerous efforts to sell Limerick or its capacity.
2. Every year PECO lowers its projections of future demand and every year its projections exceed actual demand. Growth in demand has changed substantially since the construction permit was granted.
3. The feasibility of more economical, reliable, and environmentally less harmful alternatives has improved dramatically since the granting of the construction permit.
4. The economic benefits of Limerick are overstated.
  - a. Achievement of a 70% capacity factor is unrealistic.
  - b. Tax revenues are not benefits.
5. Costs of Limerick are understated -- capital costs, water charges, fuel costs, O&M costs, and decommissioning costs. Furthermore, from a technological and a regulatory standpoint, decommissioning is very uncertain, both as to method and likelihood of occurrence.
6. External costs fail to include costs of emergency planning, radiation monitoring by the Pennsylvania Department of Environmental Resources, taxes, federal subsidies, health costs for routine emissions, probabilistic costs of accidents, fuel

cycle health costs, and transportation accident costs.

7. The costs of available alternatives are improperly accounted.

- a. The costs and benefits of a utility-financed conservation program are not calculated.
- b. The costs and benefits of wind and solar alternatives are improperly calculated.
- c. The availability of hydro resources within and near the service territory are not calculated.
- d. The economics of all alternatives has changed radically since the construction permit was granted.

## III. FINANCIAL QUALIFICATIONS

## III-1. (CEPA, KEYSTONE)

The Applicant has not demonstrated that it has met the financial qualification requirements of 10 CFR §50.33(f).

BASIS:

1. PECO is in a financially deteriorated condition which will worsen as the demands of construction continue. Its financial condition has changed substantially since granting of the construction permit.

2. PECO's bond rating is falling.

3. PECO must continue to sell bonds at extremely high interest rates. It must also continue to sell stock in order to raise funds, which dilutes the value of existing stock, further decreasing the attractiveness of PECO as an investment.

4. PECO is required to file new and ever larger rate increase requests each year. Such increases stimulate conservation so that each year sales are lower than projected, generating less than expected revenue, requiring a new and larger rate increase.

5. Post-TMI safety requirements are likely to increase the financial burden on PECO; PECO has already been forced to slow construction on numerous occasions because of financial difficulties.

6. Even if PECO should succeed in completing construction, its deteriorated financial condition is likely to adversely affect safety decisions during construction and operation.

## III-2. (SCHNIPER)

Intervenor asserts that the decommissioning and dismantling statement by applicant Philadelphia Electric Company in its application for operating license is on its face totally inadequate and in fact a concealment of the extreme financial problems posed by decommissioning and dismantlement. Intervenor is 34 years old and hopes to be alive at the stage when this reactor reaches the end of its useful life if licensed. Intervenor also asserts that his children will certainly be alive in the year 2020 or thereafter, and they in all probability will be living in the area affected by the Limerick station. Intervenor asserts that the first alternative proposed by Philadelphia Electric Co., which is sealing up structure and otherwise moth-balling it is an impractical and irresponsible proposal. Radioactive isotopes of nickel, which will be present throughout the framework for the decommissioned reactor and also the containment structure have a radioactive half life measured in millions of years. Other trace amounts of plutonium and other isotopes have half lives measuring from thousands to tens of thousands to hundreds of thousands of years. Intervenor submits that it is intolerable to have such a concentrated repository of intense radioactivity unmaintained and only sporadically guarded in the midst of an industrialized and highly populated area of which intervenor is a part. Intervenor submits that the property values of his residence in the future

would be adversely affected by being encumbered by the ghostly, highly radioactive and only sporadically guarded, if at all, remnant of an earlier primitive atomic age. Intervenor will prove through the submission of numerous learned articles by the Nuclear Regulatory Commission staff as well as by independent highly-qualified observers such as the Union of Concerned Scientists, that the discharge of radioactive elements in an unmaintained and abandoned structure into the environment could begin, within a period of decades after the structure's dismantlement. Such a discharge of radioactivity would adversely affect intervenor's children and his grandchildren in terms of atmospheric water and air radioactive pollution.

Intervenor will further be prepared to prove at a hearing in this matter that hauling away all radioactive material from the decommissioned reactor would be astronomically expensive and would probably not even be feasible with current technology. The Union of Concerned Scientists as well as the Nuclear Regulatory Commission staff have, in various studies, identified total decommissioning costs for a dismantlement program to be with optimal assumptions in the range of 30-35% of total construction costs. For the Limerick station this would be approximately \$2,000,000.00, which value would have to be inflated to the value of \$2,000,000,000.00 1981 dollars and 20-20 dollars, which would surely be a truly astronomic figure. In addition, no permanent repository for such massive quantities of radioactive

waste materials has ever been developed by the United States Government or by the nuclear industry. The experience of Three Mile Island suggests that the problems posed by a dismantling and removal operation are insolveable with present technology. Even assuming that such problems are solveable, the development of new technology will probably be astronomically expense and suggest that the cost of dismantling a reactor and interrering its radioactive remains in such a manner as to provide a low threat to human life for thousands or years to come would probably approach the total construction costs of building a reactor in the first place.

The Philadelphia Electric Company makes absolutely no provision in its application materials for a financial plan to finance these considerable costs. It is submitted that in view of the Three Mile Island precedent that these costs will be "dumped" upon the public in a balloon fashion once the reactor has completed its useful life or as a result of an accident, needs to be decommissioned. A crisis situation will therefore be engineered whereby huge new rate increases will have to be pushed through to finance a project nearly equal to building the reactor in the first place or in the alternative huge new tax burdens and revenue burdens will be imposed upon various governmental authorities to accomplish the same. In either event, intervenor and his grown children will certainly be directly and severely affected. Intervenor submits after reviewing the decision of

the Atomic Safety and Licensing Appeal Board, dated March 19, 1975, in this matter on Philadelphia Electric's construction license and also the initial decision of the Atomic Safety and Licensing Board, dated June 14, 1974, that no consideration was given to the above intractable problems and their resolution when a construction license was granted to Philadelphia Electric Company. Applicant submits on this ground alone that an operating license should at best be granted for only unit #1, which is presently about 65% completed and operating license should be denied for unit #2 because of the intractable and perhaps insoluble problems of decommissioning and also because the anticipated need for power referred to in the initial decision of the Atomic Safety and Licensing Board in this matter on June 14, 1974, pages 65-75 is no longer a valid analysis and needs to be reconsidered and relitigated. The anticipated natural gas shortage is not an economic or geological reality. The anticipated shortage of an alternative fossil fuel coal is not an economic reality and from the environmental standpoint great progress has been made in reducing the ecological toxicity of coal as a fossil fuel. In addition, the advisability of relying on oil needs to be reconsidered in view of the astronomically escalating costs of nuclear power and the adverse economic impact that these astronomically escalating costs will have on the economy and national security. In view of the fact that the economic ability of rate payers to support a nuclear power installation may well be exhausted simply by paying for soaring construction costs, and

also soaring nuclear fuel costs, there would appear to be little economic room for the public to absorb further astronomic decommissioning costs which are unique to a nuclear reactor station without the economy of the area suffering a major economic setback.

## IV. EMPLOYEE TRAINING

## IV-1. (LEWIS)

The training of spent fuel truck drivers is not adequate to protect the health and safety of the public.

BASIS: Training of drivers who drive trucks loaded with spent fuel includes training to ignore police directions and to run barricades. See Transportation Security Personnel Training Manual, NUREG-0465, and critique by the Sierra Club Radioactive Waste Campaign, The Waste Paper, Vol. 3, No. 2, p. 5.

## IV-2. (LEWIS)

Applicant cannot assure enough qualified reactor operators (ROs) to run the Limerick nuclear power plant safely.

BASIS: Deficient RO testing cannot assure qualified ROs, as evidenced by past NRC practices. (H. Dieckamp to Chairman Pallidino, August 20, 1981 letter.) During the recent investigations of examination cheating at TMI, the TMI licensee petitioned for leniency on the basis that "examinations in April (were) consistent with the NRC past practices for other licensing examinations."

## V. ENVIRONMENT/HEALTH EFFECTS

## V-1. (ANTHONY)

The environmental reports for the Limerick nuclear plant do not comply with the requirements under the National Historic Preservation Act and NEPA for the protection of historic sites such as Hopewell Village, Valley Forge National Park, and the Schuylkill River Canal.

BASIS: In EROL Chap. 2, sec. 2.6, the effect of Limerick's construction and operation is dismissed in six lines. The report is, accordingly, not in compliance with 10 CFR 51 and the assertion that it is "in accordance" is a false statement. The same holds true for the Environmental Report - construction Permit Stage which is referred to in its sections 2.1.2, 2.1.3, and 2.3. The inadequate content of the latter sections is discussed below.

The EROL does not comply with 10 CFR 51 under subpart B, section 51.20(a) in which an applicant, in an environmental impact statement is required to consider 1) probable impact on the environment, 2) probable adverse effects which cannot be avoided, 3) alternatives to the proposed action, 4) relationship between short term and long term, 5) irreversible and irretrievable use of resources (including cost-benefit analysis). In section 51.21 the applicant is required to cover the same points and to "reflect new information." The EROL only reflects back to the construction stage report of 1972 referred to above, in which the plant itself is recorded as not visible from Hopewell Village National Park because the 900 foot hills intervene, but is visible from many of the higher spots in

Valley Forge National Park (2.1.3.1, 2.1.3.3).

In covering only the direct visual impact of the plant on these two national historic monuments, PECO failed to meet the requirements of section 51.20 and 51.21 above. It failed to cover the five requirements. Had PECO done this, the decision to proceed with construction might have turned out "no", combined with other damaging impacts. In the EROL PECO did not apply the "new information" on low level radiation in air, water, and on the land, to the historic sites. It failed to evaluate the effect of the plume from the cooling towers which will be visible almost constantly from Hopewell Village and Valley Forge and all of the historic places within 10 miles of Limerick, numbering 54, according to the EROL, Table 2.6-1. The plume "under proper meteorological conditions may persist for miles downwind, rising thousands of feet above the tower top." The tower stands at 764.5 feet, itself 547 feet high.

The large plume would therefore sometimes extend to Hopewell Village and also Valley Forge. It would warn of radioactive vent releases in the same path and the deposit of radioactive particles on vegetation and in water. It could be a deterrent to visitors and a reminder of TMI, the threat of a nuclear accident. None of these impacts or costs were considered by PECO, nor were the alternatives. The plant's effect on aquatic life and stream flow was ignored, and its interference with the use of the river at Valley Forge. In the 1972 report PECO recorded that the Schuylkill canal had been donated to the State (section 2.1.2) but the EROL did not evaluate the effect on a proposed park at Fricks Lock across

the river from the plant's water intake where the river bed will be dredged down 7 to 9 feet from its natural level.

PECO and the AEC did not provide proper information in the report to the Advisory Council on Historic Preservation as required in section 106 of the National Historic Preservation Act, 16 USC 470, et seq. The Council "verified that there are no National Register properties that would be affected by the nuclear facility proposed for Limerick Township, Penna." in its letter of April 10, 1970 to the AEC (2.1.3.4, envir. report, 1972). It was in error. The AEC and its successor the NRC are responsible that the provisions of 36 CFR 800.1 (b)(1) were not met by the Council. Furthermore, in section 800.4 of the same Title, under Federal Agency Responsibilities, is clearly stated:

...It is the primary responsibility of each agency official requesting Council comments to conduct the appropriate studies and to provide the information necessary for an adequate review of the effect a proposed undertaking may have on a National Register or eligible property....  
...the ultimate responsibility for compliance with these regulations remains with the Federal agency and cannot be delegated by it.

PECO and the NRC are also responsible that the state did not provide the protection required from the State Historic Preservation Officer as required under 36 CFR section 1201.8. In whatever way the Council's letter, above, was arrived at, it should have had no weight in the EROL because there is no provision in 36 CFR section 800.3(a):

An undertaking shall be considered to have an effect whenever any condition of the undertaking causes or may cause any change, beneficial or adverse...

and under section 800.3(b):

Criteria of Adverse Effect. Adverse effects on National Register or eligible properties may occur under conditions which include but are not limited to:

1. Destruction or alteration
2. Isolation from or alteration of .... environment
3. Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting....

It appears obvious from the mistakes and omissions in this section of the EROL alone that the NRC should not have accepted this report and allowed the operating licensing process to go forward. Until the requirements of all the federal regulations are met the process should be halted and the application sent back to PECO for correction and further study of impact, taking into consideration the vital factors like those above which were omitted.

The above omissions and errors are not subjects litigated at the construction permit stage. For instance, the dimensions of the plume were not considered then. The requirements under section 2.6 of NRC Regulatory Guide 4.2 were not met in the EROL contrary to the assertion in EROL 2.6. As for "new information" mandated under 10 CFR section 51.21, the estimates of the plume dimensions are new as well as the post-TMI factors such as fear of a repeat at Limerick. This obviously dampens the desire to visit Hopewell or Valley Forge, including visitors from abroad. Also, a new factor is the increase of interest in Valley Forge as a national park, changed from a state park in March 1977. Last year visitors came from 48 different countries.

## V-2. (ANTHONY)

The impact of the Limerick plant operation on Schuylkill River water users has not been properly assessed in relation to radiation contamination, low flow, and drinking water quality.

BASIS: The four water suppliers downstream from the Limerick plant from 2.2 miles to 14.1 miles serve population of 937,000. The fifth user on the river is the City of Philadelphia which serves an additional 959,700. (EROL, Table 2.1-38)

By far the largest suburban supplier is Philadelphia Suburban Water Co. which has its main pumping station at Pickering Creek, 7.5 miles from the plant. It pumps from that creek, Perkiomen Creek, and the Schuylkill. It supplies the larger part of three counties and averages 80 MGD. It could be noted that the Limerick plant use of water is about half that daily amount, just for cooling.

The unfavorable impact on Suburban comes from three sources: radioactivity deposited from the air, contamination from the Schuylkill, and interference with its water sources in the Schuylkill and the Perkiomen Creek. Since the prevailing winds for the major part of the year blow from the plant down the valley, the airborne radioactivity will be deposited in the waters where Suburban's Pickering pumping station draws. The water it draws from the Schuylkill will be contaminated by the metals and radioactive elements concentrated in the plant's blowdown, deposited in the river. The degrading of the river for drinking water users downstream is indicated in Table 5.3-8 where 29

of the 37 parameters show a decline in quality from the addition of Limerick effluent. A similar result appears in Table 5.3-9 where another strikingly unfavorable factor is the .175 (mg/l) recording of Mercury, more than three times the .05 permissible level.

Radioactive water will be deposited in the Schuylkill from blowdown and spray pond releases during routine Limerick operation. Larger releases will come from faults in the heat exchangers for service water and feed water. In case of accident and release to the containment structure, large amounts of radiation will escape into the air, into the spray pond seepage, and into blowdown and other discharge to the river. In case of any "operational emergency requiring a shutdown" the constraints required by DRBC on the amount of water drawn from the Schuylkill are suspended. That could cause a severe drain on the river under low flow conditions and a consequent increase in radioactive concentrations at the plant outflow to the river.

It is possible that emergency water drawing at the plant during low flow could deprive PECO's plants downstream, Barbadoes and Cromby, entitled to 100,600 GPM and 255,000 GPM respectively. (Table 2.1-39) Suburban's use would also be threatened. In addition, Suburban will experience interference with flows on the Perkiomen Creek if the Delaware diversion is authorized.

Since drinking water for almost two million people and process water for 16 industrial plants will be impacted by the Limerick plant, more extensive study of the effects of flow and quality are required. PECO's application is lacking this study. Furthermore, the opportunity for Suburban and other water suppliers

to have an influence on the EROL has not been provided by PECO. In fact the existence of the EROL was not known to Suburban until F.O.E. (Anthony) approached the company in early November 1981. Mr. Kenneth E. Shull, VP for Research/Environmental Affairs then requested the chance to review the EROL and was only provided with a copy on Nov. 12. (K.E. Shull letter, Nov. 13, 1981)

U.S. Dept. of Interior Input. The record of the Limerick plant environmental impact process includes reports from the Dept. of Interior dated April 14, 1971, April 23, 1971, July 6, 1971, Feb. 23, 1973, Nov. 7, 1973, Jan. 30, 1974, March 11, 1980, Dec. 16, 1980, Sept. 10, 1981. To summarize these reports: the Dept. of Interior questioned from the start the planning of construction of the Limerick plant without an assured water supply; it raised objections to the transfer of water from the Delaware and cited the unfavorable impacts on biota and stream flow in the Perkiomen and Schuylkill and Delaware. In its letter of Sept. 1981, the Department repeated its objections to the Delaware River diversion and commented on the lack of consideration of long-term effects on fish and wildlife resources from a nuclear accident at Limerick and the cumulative impact on fish and wildlife of inter-basin transfers of water. A request for an answer as to the applicant's intentions to act on these recommendations concluded this letter.

It appears that the suggestions made by the Department have been passed over by the applicant and the Sept. letter, at last contact (11/19/81), had not been answered by the Bechtel Power Corp., to whom it was addressed, as the source of the EROL. (Dept. of Interior letter to R.H. Elias, 11/12/81)

The apparent lack of consideration of the Dept. of Interior's recommendations constitutes a flaw in the license permit process and without this consideration, the process should not go forward.

V-3. (ANTHONY)

The hazards from the operation of the Limerick plant and the chances of adding to, or precipitating a nuclear accident from pipelines, floodwaters, railroad, and nearby industries have not been sufficiently analysed.

BASIS:

Pipelines. There are 7 gas pipelines within a five mile radius of the plant, and two liquid refined petroleum lines. Five of these lines cross under the Schuylkill River, the crossing of the Atlantic (ARCO) line is approximately 5000 feet downstream from the plant, and the two Columbia lines are next to it. The latter lines travel NE, passing about 3800 feet from the reactor building. The ARCO line travels about 3500 feet within the actual site boundaries of the plant itself, passing within 25 feet of the perimeter of the 500 KV switchyard and 1200 feet of the reactor building. (EROL Table 2.1-21) Age of the lines: Columbia 31 years, Mobil 33, UGI 26, Texas Eastern 38, Transcon 29, PECO 1929 and 1930.

Both the Columbia lines and the ARCO line impose a threat on the plant. Any rupture, fire and explosion could cause a fire in the plant area, possibly spreading into the buildings. Escaping fumes could be ignited in the high tension switchyard. Fissures opened in strata between the ARCO line and the plant during construction could carry explosive fumes to the plant from leaks in the pipeline. Furthermore, the pipeline crosses

Possum Hollow Run about 200 feet from the switchyard, and this is a point where the pipeline is vulnerable to flood currents which could undermine and fracture the line.

At the point where the three pipelines cross the Schuylkill, they will be subject to increased stress from the raising of water temperatures from plant blowdown. Especially in the summer with low river flow and maximum blowdown heat, the expansion forces on the pipes' river crossings could cause joint leaks and possible ruptures. (See figures 2.1-3,-4,-8, re. the above.)

Industries and Railroad. (Figure 2.1-7) The railroad line passing within 200 feet of the plant buildings has been considered for its potential for fire and explosion from hazardous materials being transported, but no estimate of the effect of flood waters at 120 feet elevation, averaging between 2 to 3 year frequency, and 127 foot levels every 10 years, has been related to roadbed damage and derailment. (Figures 2.4-3,-6.) There is potential for the triggering and combining of fire and explosion with pipeline fuel and railroad transport. There is a parallel and combined potential from hazardous materials used and stored at industrial plants within the LPZ perimeter, such as Structural Foam, Inc. and Firestone Tire and Rubber (Plastics) Co. The former is located within 500 feet of the ARCO and the Columbia pipeline crossings of the river (Table 2.1-20).

V-4. (ROMANO)

The Applicant has improperly interpolated the meteorological effect of the tower plume by using average temperature as the basis for calculations, and therefore has not adequately studied the potential for air crashes due to cooling tower turbulence, changes of Visual Flight Rule conditions, and carburetor icing potential.

BASIS: As tower plume effects relate to air safety, it is the worst condition that must be faced, namely, those conditions resulting from minimum daily temperature (42.5°, according to the Chester County Climatological Summary covering the U.S. Weather Bureau's official records), and not a softened effect when using average temperature of 51.8°, as in Table 5.1-17 of the EROL. Similarly, the humidity Table 5.1-16 of the EROL discusses Relative Humidity % Distribution, which does not include the effects of the worst case condition.

The Chester County Planning Commission 17-year record from the U.S. Weather Bureau taken at Philadelphia International Airport shows averages of 78%, higher than the 68% average used by the Applicant in the PSAR. Further, the increase in humidity from the vapor issuing from the tower further increases the humidity and therefore increases clouds, rain, icing, etc.

As a result of using the average instead of worst condition both for temperature and humidity, the calculation of frequency of weather modification and length of visible and invisible plume from the cooling towers is incorrect. As a pilot, carburetor

icing and reduction of Visual Flight Rules will threaten me (and other pilots) with bodily harm from engine failure, on the one hand, while reducing the freedom to use the navigation VOR, only 1.3 miles from the Limerick reactor (comments re Table 2.1-22 and §§5.1.4.2.1.1 and 5.1.4.2.1.2 of EROL).

Furthermore, convection currents caused by the heated vertical rising air movement out the cooling towers can result in severe turbulence with potential for airplane crashes, including over-shooting or under-shooting runways of airports. ("Commercial Pilot" Aero Products Research, 2nd Ed., Culver City, CA, pp. 117-119, item 235.)

V-5. (ROMANO)

Releases of radionuclides during both normal operation and under abnormal and accident conditions will cause adverse health effects for me, my family, and members of AWPP.

BASIS: The releases of radioactive nuclides are to be "as low as reasonably achievable" (Appendix I of 10 CFR §50.11). The calculations made by the Applicant of the releases at Limerick are based on "annual releases." The body is not affected by average annual releases but by the highest concentration of radioactive release. To report on the annual basis could distort the dangerous effects.

For example, suppose 2 units is the maximum permitted annual dose. If a total of 12 units of radioactivity are given off in three months of one year's operation, that would calculate as 1 unit per month on an annual basis. Actually as far as body effect is concerned, the dosage was 4 units per month--far exceeding the maximum dose.

The Applicant must be required to calculate releases based

on the worst condition release, not on annual averages.

Further, the water-soluble particles and gaseous radioactive units such as Iodine-131 released from the turbine reactor stacks can come in contact with the cooling tower vapor and be carried in the plume to contaminate land and water affecting food and water wells.

As per Figure 5.1-2 and Table 5.1-15 of the EROL, there are over 200 days during which either the cooling tower vapor can drift to join the gaseous radioactive releases from the turbine enclosure, or the radioactive releases from the turbine enclosure drifts over to join the cooling tower vapor to be broadcast, or to be held in fogs, rain, etc.--and therefore to be a danger to breathing, eating garden vegetables and farm products, and drinking water.

Further, PECO has not made provision to have an independent radiological testing program, and according to EPA Drinking Water Standards, changes must be made which now endanger those who will use drinking water originating from the Schuylkill River, because of rules regarding radiological contamination which can seriously endanger the health of users.

It is important that the Applicant and the NRC do studies on confluence of stack releases from the turbine enclosure and other units venting gaseous or particulate radioactive releases with cooling tower vapor-heat releases, as it relates to broadcast of contamination previously calculated to diffuse and dilute in the air, on the erroneous temperature and humidity basis used by the Applicant. Applicant should also be required to study the effects of numerous transformers and the resultant possible contamination of water by PCBs.

## V-6. (CEPA)

Limerick intends to rely on the Delaware River for a water supply for its cooling system. Removal of water from the river will directly and adversely affect the water supply for the City of Philadelphia, which relies on the Delaware for over half of its drinking water.

## V-7. (CEPA)

There is no plan for disposal of spent nuclear fuel from Limerick and it is unlikely that such a plan will be developed. No operating license should be issued until a plan is developed.

## V-8. (LOCHSTET)

The environmental and health consequences of radon emissions from the various parts of the nuclear fuel cycle which supports the Limerick plant have not been adequately evaluated. This failure will result in an Environmental Impact Statement (EIS) that does not satisfy NEPA. The EIS evaluation of costs and benefits will be incorrect.

BASIS: The NRC has consistently refused to consider health and environmental impacts beyond 10,000 years into the future, in licensing actions. The Commission did, however, put forth the proper evaluation in GESMO (NUREG-0002). The Commission must be consistent.

## V-9. (LOCHSTET)

The environmental and health consequences of the Iodine-129 to be created in the Limerick plants have not been adequately evaluated. This failure will result in an Environmental Impact Statement (EIS) that does not satisfy NEPA. The EIS evaluation

of costs and benefits will be in error.

BASIS: It is impossible to isolate Iodine-129 from the environment for millions of years. In this case, the health effects which must necessarily accrue at that future time must be explicitly noted.

V-10. (SCHNIPER)

Intervenor in examining the environmental impact statement of PECO's application for an operating license for Limerick has found the blanket statement that the Limerick site contains no known fossil or other archeological remains for which provision need be made. This assumption has proved to be wrong as illustrated by a recent article in the Mercury of Pottstown, PA, November 19, 1981, describing an important fossil find at Limerick.

Intervenor in examining the environmental impact statement of Philadelphia Electric Company's application for an operating license for the Limerick station has found the blanket statement that the Limerick site contains no known fossil or other archeological remains for which provision need be made. This assumption has proved to be wrong as illustrated by an article in the Mercury of Pottstown, Pennsylvania, November 19, 1981, a copy of which article is enclosed describing important fossil find at the Limerick site. Obviously, the exploitation of these remains would be of great interest to the public and would be of particularly great interest to intervenor and his family who are amateur geologists and do enjoy excavating local fossil sites in the Poconos and elsewhere. Intervenor and his family would be most grateful for the opportunity to be able to explore this important new site even on an amateur basis. After care-

ful review of the above-cited prior decisions of the licensing boards in this matter and of the prior contentions of parties and of relevant portions of Philadelphia Electric Company's application for an operating license, intervenor is convinced that no provision has been made for preservation of the important discovery at the Limerick site of palentological significance and intervenor submits that there is reason for the Commission to require applicant to submit a plan concerning what steps applicants propose to take to further explore the palentological find, to arrange that further construction not interfere with or destroy any palentological evidence.

## POINT PLEASANT

V-11. (Del-AWARE)

Intervenors believe and therefore contend that the supplemental cooling water system [which consists of the Point Pleasant Diversion, the Bradshaw Reservoir, transmission mains, intakes, pumping stations, consumptive use and discharges into the Delaware, Perkiomen, and Schuylkill -- hereinafter supplemental cooling water system (SCWS)] will cause unevaluated, serious and indeed enormous damage to the environment and economy of Bucks and Montgomery Counties and the Delaware River and its Valley.

BASIS: Some of the harm will result from construction pursuant to locations and designs not before any public body prior to the construction license issuance, partly because plans were general and partly because approvals were tentative, and partly because of major changes since 1975 by the Applicant and its joint venturer. Others result from the operation of the SCWS, which was generally not before this Commission at the construction license stage, and which, to the extent it was considered, has substantially changed, or is subject to significant new information deriving from ongoing natural and human management of the Delaware River since 1975. Moreover, since 1975, significant changes have occurred in the plans of the joint venturers such that the Point Pleasant diversion would no longer occur but for the Applicant's desires for the water; thus the environmental and economic impact of the Point Pleasant facility are essentially attributable to Limerick. Despite the foregoing,

the FSAR and EROL are essentially silent on the effect of the SCWS on the Delaware River and the environs of Point Pleasant, and totally fail to address the secondary effects of the utilization of the Point Pleasant system by the Applicant, namely the creation of the joint venturer's water system with its significant environmental and economic impacts. Moreover, for the reasons stated as to specific contentions as appropriate, there has been no systematic and in some cases, no determination of the impacts of the SCWS by any other federal agency, based on an environmental record. Finally, a present comparison of the SCWS with alternatives, based on corrections, changes and operating considerations, changes the balance of desirability and precludes permitting LGS with SCWS as proposed.

V- 12. (Del-AWARE)

An operating license cannot and should not be granted insofar as it authorizes or depends on the SCWS, because the Applicant has failed to show that SCWS will not cause a substantial, irreparable and unjustifiable harm to the economy and environment of the Delaware River Valley.

BASIS: The following specific contentions relate to the failure of the Applicant to develop facts to carry its burden of proof that the LGS SCWS will not unduly adversely affect the economic and environmental characteristics of the area, as well as ignoring the specific evidence which shows the effect, and requires analysis and consideration, which Applicant has failed to carry out or present to the Commission.

Specific Contentions Relating to Construction Changes and Undecided Construction Aspects

V- 13. (Del-AWARE)

Construction pursuant to the present proposed intake location and design will substantially and adversely affect a National Historic Landmark, fishing and aquatic resources, recreation and navigation in the Delaware River and Delaware Division, Pennsylvania Canal. These impacts were never considered in any environmental review by any agency, and were not considered by the Commission at the construction permit stage.

BASIS: Since the CP stage, and since the completion of the DRBC environmental review, radical changes were made in the intake from the Delaware River. The present design and location will require several thousand cubic feet of production blasting of extremely hard rock under the riverbed and under the Canal, a National Historic Landmark so designated since the CP stage. It will be located in an eddy or pool in the riverbed, and its construction will blast all aquatic life, including an important shad nursery and short nosed sturgeon, an endangered species. It will likely cause the collapse of a retaining wall in the Canal, and may affect a historic canal house which is shored up by the retaining wall. DER is now evaluating this plan. Applicant will have substantial control over construction.

There has been no evaluation by Applicant or any agency of the impacts of the blasting to the extent and of the nature actually entailed by the plan. Evaluations were based on

erroneous or obsolete data as to depth and rock types. No evaluation has been performed of the effects on the Canal retaining wall. No evaluation has been performed by Applicant or any agency of the effect of blasting, dredging and other activity for the actual design on fish and aquatic resources. No study has been performed as to the effects on neighboring structures as to the extent and type proposed. There has been no evaluation of the impacts on resuspending toxic chemicals of such blasting. DRBC waived evaluation, leaving it to the Corps of Engineers.

V-14. (Del-AWARE)

Construction of the line through the Point Pleasant Historical District and surrounding natural areas will substantially destroy their historical character. This effect has not been reviewed in light of the determinations of eligibility for the district, by any federal agency.

BASIS: Since the DRBC approval in February, 1981, the Point Pleasant Village has been determined eligible for the National Register of Historic Places by the SHPO. Of course, it includes the applicant's intake, conduits and pump station. At the time of the DRBC approval, no district had been approved and the environmental reviews stated that the project was some distance from the Village. The blasting and permanent clearance of the hillside which the historic survey determined was a major feature of the district will permanently and irreparably destroy its integrity. The pumphouse will be a substantial and determinable intrusion. The 15 foot rip rap wall at the river's edge will ruin a beautiful natural border of the District.

Operating Impacts

V- 15. (Del-AWARE)

Operation of the intake will permanently and adversely ruin an major nursery and spawning area for American shad and a habitat for short nosed sturgeon, an endangered species, and possibly a critical habitat for both species in the Delaware River. Applicant has failed to identify or rebut such effects.

BASIS: Applicant will essentially have control over the operation of the intake and has stated it will take at a rate far exceeding the average daily allowance. The intake velocity will substantially exceed any velocity which may be present in the water, and therefore entrain and impinge fish larvae and fry, as well as impinging all age groups. The intake is located in the pool and nursery, not in the main flow channel of the River. There has been no hydraulic or hydrogeologic study performed by Applicant or other agencies of these impacts. There is no operating plan which has been disclosed. Studies made for the CP stage and existing at the itme of DRBC tentative and final approval failed to disclose the presence of sturgeon, and the shad were dismissed as unimportant at the CP and tentative approval stage. DRBC final approval related to a misunderstanding of the present proposal, and was based on Applicant's joint venturer's misrepresentation that the intake was in the main flow channel and that take would be at the average daily rate. There has been no review under section 316(b) of the FWPCA of this intake, either by EPA or the Commonwealth of Pennsylvania. Applicant has not yet applied for the associated discharge permits, i.e., into the Perkiomen and Schuylkill Rivers.

V-16. (Del-AWARE)

Operation of the SCWS will adversely affect the water quality and adequacy of water supplies in a critical reach of the Delaware River and estuary. DFBC's determination was based on a number of errors and inadequate information and cannot and should not be accepted by this Commission.

BASIS: The Corps of Engineers has indicated it will thoroughly review the impacts of the diversion on the salinity gradient downstream in the Delaware estuary. The Corps has underway a salinity study of the estuary, and until complete, cannot determine the effects. DRBC had inadequate information to make an evaluation. While DRBC limited Applicant's withdrawals at low flow periods, it failed to prohibit Applicant from using its joint venturer's allocation in such periods, and failed to limit the rate of withdrawal of the daily allocation. Thus, short-term drawdowns can be extreme. This will have substantial adverse effect which DRBC did not consider. Applicant has failed to address these effects. Moreover, operation will cause resuspension of toxics, eliminate dilution, and therefore increase health risks to one million people who drink water from the Delaware River. Increase in the salinity gradient will cause loss of drinking water supplies as well as contamination and loss of groundwater drinking supplies of Camden and the Philadelphia area, and loss of fisheries in the entire river.

BASIS: EPA water quality surveys show the Delaware River to be extremely toxic. There is no such showing as to Perkiomen or Schuylkill water. Applicant and DRBC have wholly failed failed to review this. EPA has made no determination, and DER's water quality determination in connection with the NWRA intake does not address Applicant's discharges and is under appeal in the Pennsylvania Environmental Hearing Board.

V-17. (Del-AWARE)

Construction and operation of the SCWS will cause the construction and operation of the joint venturer's system, and unlike the situation at the CP stage, is a sine qua non. Thus all the effects inherent in the construction and operation of the SCWS should be treated as impacts of Limerick.

BASIS: Since 1975, there has been drastic downsizing of the estimate of need for public water supply from the joint venturer's service area. Initial service is now calculated at less than 7 MGD, going to NWRA's estimate of only 20 MGD in 10-20 years. AS supplemental water, it will only be used in drought periods. The average daily use actually to be anticipated, therefore, is less than .7 MGD initially, and 2 MGD in 10-20 years, assuming drought conditions 10% of the time. Clearly, the system, at a cost of \$35 million to \$60 million, would be infeasible for such volumes. Applicant expects to pay most of the initial capital and operating costs, based on a formula relating to NWRA's maximum daily use.

V-18. (Del-AWARE)

Despite the foregoing, and not in contradiction, if the diversion is constructed because of Applicant's desire, it will lead to major dislocation and environmental damage in Bucks County through induced growth.

BASIS: The economics of paying for the NWRA plant will dictate the communities, if any, which subscribe to it, to spread their enormous (\$2 or more per thousand gallons) costs over a broader base. This will not increase normal usage, because communities will still tap groundwater except in extremity. NWRA usage will still be small. But cost will be large, and it will cause more intense growth, inability to enforce local zoning and planning policies and ordinances due to economic necessity, etc. These impacts have not been addressed by this Commission. DRBC determination is based on comparing the present impacts with those of the initial larger proposal. This does not preclude this Commission from initially considering the impact of this plan in present circumstances compared with no effect, which was concluded in 1975, due to the larger DRBC plan for NWRA.

V-19. (Del-AWARE)

Available alternatives are preferable to SCWS. Applicant has failed to show that the SCWS is preferable to such alternative systems which are available to it, e.g., storage on the Schuylkill River, dry cooling towers, etc, or deleting Unit 2.

BASIS: Applicant conceded that storage could be built on the Schuylkill, but has not compared its impacts with those

of the present plan. Such plan would avoid all or most of the impacts cited above. Dry cooling towers have totally different economics than those of 1973, both in themselves, because Applicant is bearing a larger share of joint costs, and because of the cost of compensating storage on the Delaware. This has less justification today than in 1973 because of load trends and costs.

V-20. (Del-AWARE)

The NRC cannot, procedurally, determine the operating license issue with respect to the Delaware River diversion until PECO has applied for and obtained water quality discharge permits for the Perkiomen and Schuylkill River discharges, which permits, under section 316(b) of the Clean Water Act (FWPCA) must reflect application of best available technology for the intake at the Delaware River, which in fact has not been applied, especially with respect to location of the intake, as required by the EPA guidelines. Also permits must be obtained from DER and the Corps of Engineers for the intakes and obstructions; no such permits have been issued.

BASIS: The National Environmental Policy Act, the Fish and Wildlife Coordination Act, the Clean Water Act of 1972, as amended, the National Historic Preservation Act, the Administrative Procedure Act, and the Atomic Energy Act, and the regulations thereunder.

V-21. (Del-AWARE)

No water quality certification under FWPCA, section 401, has been issued for the operating license; any action on the construction permit is invalid as a result of changed circum-

stances, including changes in the diversion plan.

BASIS: FWPCA, NRC regulations.

## VI. QUALITY ASSURANCE/CONTROL

## VI-1. (ROMANO, LEWIS)

Applicant has failed to establish and carry out an adequate quality assurance program as required by Appendix B of 10 CFR Part 50. This is shown by a pattern of careless workmanship, departure from specified procedures, together with faulty inspection and supervision in the construction of Units 1 and 2 of the Limerick Generating Station.

Specifically, Applicant has been cited by the NRC for numerous infractions concerning defects in concrete placement, improper repair, including damage to concrete reinforcing bars, improper record keeping, and failure to maintain reinforcing steel clearances. Other infractions involved cleanliness in the area of containment penetrations, failure to follow specified procedures for welding, infractions bypassed by inspection and reported by concerned workmen, and failure to adequately correct various violations.

Further, Applicant has failed to comprehensively monitor the effects of quarry blasting as it relates to effects on concrete setting, concrete integrity in structures, and changes in sub-rock fractures.

The lack of quality assurance during construction of the Limerick reactors increases the risk of an accident and thereby threatens the health and safety of Petitioners and the public.

BASIS: IE Inspection Report No. 50-353/76-06 (For inspection of Unit 2, Oct. 16, 19-22, 1976) and Applicant response of Dec. 15, 1976;  
 IE Inspection Report No. 50-352/76-09 (For inspection of Unit 1, Sept. 11, 14-17 & 27, 1976) and Applicant response of Nov. 23, 1976.  
 Director's Decision under 10 CFR 2.206 and associated ongoing investigation regarding effects of quarry blasting including letter of Oct. 1, 1981 from Applicant to Mr. Robt. Tedesco, Assistant Director of Licensing, with Attachment No. 1 enclosure.

NRC Inspection Report No. 50-352/77-12; 50-353/77-12; with letter of Dec. 21, 1977 to P.E.'s Vice President Boyer from Robert Carlson, NRC Chief of Construction and Engineering Support Branch, Attachment I, Deficiency in 10 CFR 50 (Appendix B).

Nov 9, 1977 letter from NRC to Applicant (50-352/77-12; 50-354/77-12) Appendix A (Notice of Violation) see p5, item 4.

P.E. Boyer's letter of Dec. 9, 1977 to Boyce Grier, Director, office of Inspection and Enforcement, Region 1, USNRC, King of Prussia, Pa.

Oct. 12, 1977 NRC's Robert Carlson (above) to P.E. (Boyer), Inspection Report No. 50-352/77-10; 50-353/77-10 (Appendix A "Notice of Violations")

p5 of Oct. 2, 1977 NRC Inspection Report No. 50-352/77-10; 50-352/77-11 unresolved item or items with NRC (Carlson) letter to Boyer under Appendix A, Violations A,B,C.

Letter of April 5, 1978 P.E. to NRC's Boyce Grier (above), Attachment p 1 of 4 item 2.0.

Page 10 of June 15, 1978 report on May 16-23/78 inspection at Limerick by Mattea.

P.E. report of Grier (above) page 1 item 2.0.

July 18, 1978 report of inspection June 26-30, 1978.

## VII. CONSTITUTION/CIVIL LIBERTIES

## VII-1. (NLG)

Measures which are likely to be taken by the Applicant in order to secure the plants against sabotage or theft of nuclear materials are likely to infringe upon the civil liberties of the public.

Basis:

Petitioner is unable at this time to state the exact nature of the security measures planned by the Applicant. This information has not been made public to date. Petitioner will attempt to obtain these plans as soon as possible within the framework of the discovery process (with appropriate safeguards).

However, at this time it can be said that those security measures are likely to infringe upon Petitioner's civil liberties and those of other groups and individuals. Due to the inherently dangerous nature of nuclear material, it will be necessary for the Applicant to secure the plant against sabotage and theft. Elsewhere, security measures taken to protect other nuclear facilities have resulted in surveillance of non-violent individuals who oppose nuclear power. The Applicant has itself admitted in a proceeding before the Public Utility Commission that for the past several years, it has engaged in surveillance of individuals opposed to the Limerick plants. Such surveillance poses a threat to civil liberties, including the First Amendment right to free speech and peacefully to assemble. Even when legal, such surveillance has a chilling effect on the exercise of those rights. Plant workers may also be subject to such surveillance.

Petitioner National Lawyers Guild, therefore, requests that the operating licenses be denied at least until such time as the Applicant provides adequate assurance that the plants will be adequately protected in such a manner as not to infringe upon civil liberties.

VII-2. (ANTHONY)

(a) Fifth Amendment. "No person shall ... be deprived of life, liberty, or property without due process of law."

(b) Ninth Amendment. "The enumeration in the Constitution of certain rights shall not be construed to deny or disparage others retained by the people."

The operation of the Limerick plants will threaten the health and lives and property of millions of residents within thirty five miles or more from the plant. To grant an operating license will usurp or circumvent the due process guaranteed to these citizens.

The construction to date at Limerick has already denied the rights guaranteed to citizens to make decisions affecting their lives, families, health and well-being since PECO has never given to citizens the information which it must know as to the risks from radiation from operating the plants as contrasted with alternate fuels or a choice of decreased consumption and conservation measures. To grant an operating license to PECO before the millions of residents who are at risk have been given this choice denies their constitutional rights.

Under the 5th Amendment the concept of Substantive Due Process establishes that the Federal Government can neither take any action nor refrain from taking any action which deprives an individual or group of individuals from enjoying a constitutionally protected "liberty" interest.

In Meyer v. Nebraska, 262 U.S. 390, 399 (1933), the court held that the right to obtain information is a protected liberty under the due process clause. In addition to the right to obtain information to enable one to make informed decisions regarding fundamental personal questions, there is an emerging right of citizens to be protected in our natural and personal state of life and health, as noted in Environmental Defense Fund, Inc. v. Hoemer Waldorf Corp., 3ELR 20794 (D. Mont. 1970).

(c) Fourteenth Amendment. In EDF v. Hoemer Waldorf, the court held:

I have no difficulty in finding that the right to life and liberty and property are constitutionally protected. Indeed the Fifth and Fourteenth Amendments provide that these rights may not be denied without due process of law, and surely a person's health is what, in a most significant degree, sustains life...

(d) NEPA. Under NEPA the involvement of the public through NEPA in the decisions of federal agencies is delineated at 40 CFR §1506.6 and reinforced in 40 CFR §1500.2(a), '0 CFR §1503.3(a)(4) and 1505.1(e) and 1506.6(c)(1).

By not informing its ratepayers as to the hazards to their health and well being before the choice of building the nuclear plant was made, rather than a choice of the alternatives

to it, PECO and the NRC denied ratepayers and all the inhabitants in the 50-mile area surrounding Limerick their constitutional rights under the Fifth, Ninth and Fourteenth Amendments of the U.S. constitution and NEPA (42 USCA §4321).

## VIII. EMERGENCY PLANNING

The following abbreviations are used in the Petitioners' emergency planning contentions:

1. Limerick Generating Station Emergency Plan  
(Hereinafter EP, Plan, Emergency Plan, or LNGSEP)
2. NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"  
(Hereinafter NUREG-0654)
3. 10 CFR Part 50, Appendix E  
(Hereinafter Appendix E)

## VIII-1. (LEA)

The Applicant's Emergency Plan is inadequate to protect the health and safety of the public, in that the spectrum of postulated accidents in section 4.2 of the Plan does not encompass the spectrum of credible accidents for which emergency planning is required, namely, accidents beyond the design basis.

BASIS: FSAR §4.2; NRC Final Rule on Emergency Planning, 45 Fed. Reg. 55402 (Aug. 19, 1980)

VIII-2. The emergency classification and action level scheme required by 10 CFR §50.47(b)(4) as set forth by the Applicant is inadequate and incomplete, in that it is based on old Regulatory Guide 1.101 (prior to its amendment to incorporate NUREG-0654). Therefore the definitions for the four classi-

fications are incorrect and must be updated.

Furthermore, the Applicant has selected its emergency events and associated emergency action levels (EALs) based on guidance in draft NUREG-0610. Revisions to 0610 have been incorporated into Appendix 1 of NUREG-0654; Applicant should be required to develop a new Table 4-2, Planning Basis Summary, to reflect Appendix 1. The Emergency Plan should clearly state the basis for selecting among the example initiating conditions and EALs of Appendix 1. Initiating conditions should include the postulated accidents in the FSAR and PRA.

BASIS: 10 CFR §50.47(b)(4); Appendix E; NUREG-0654, Appendix 1, Criterion D.2.

#### VIII-3. (KEYSTONE)

Limerick operation will involve undue risks to public health and safety, because evacuation planning is not carried out beyond a 10-mile radius, although a 25-mile evacuation is assumed in the Probabilistic Risk Assessment, and despite recommendations of the NRC's own Special Inquiry Group.

BASIS: Limerick Probabilistic Risk Assessment:  
NRC Special Inquiry Group on TMI (Rogavin Report)

#### VIII-4. (CEPA)

In case of an accident, it will be impossible to protect or evacuate the large numbers of people who live within the range of danger, and no evacuation has or will be able to deal with that problem.

## VIII-5. (LEA)

Applicant's acceptance, without formal analysis or evaluation, of a circular 10-mile radius for the Plume Exposure Emergency Planning Zone does not discharge the Applicant's responsibility to ensure that adequate emergency response plans exist to protect the public health and safety in the event of an emergency at Limerick. Acceptance of or designation of a circular 10-mile EPZ is unjustified because such an EPZ fails to take into consideration local emergency response needs as they are affected by such factors as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

BASIS: The types of issues to be considered in setting the size and shape of the EPZ are specified in NUREG-0654, 10 CFR §50.33 and 50.47(c)(2), Appendix E, and 45 Fed. Reg. 55402.

(1) The proposed 10-mile radius circular EPZ includes within the EPZ portions of numerous jurisdictions at the township, city, borough and town levels of government. Calling for an evacuation of only a portion of any political jurisdiction due to a hazard which affects a large geographic area and basing emergency plans and response capabilities on such a limited evacuation will lead to severe confusion and inadequate preparation in an emergency. Therefore the Plume Exposure EPZ should include the entire geographic extent of all governmental jurisdictions at the township, borough, and town level that are bisected by the proposed circular EPZ.

(2) There are very densely areas in and near some cities in the vicinity of Limerick, Philadelphia being the largest such city. In the event that the wind is blowing toward these areas when an large release of radioactiviy occurs (the predominant wind at Limerick is from WNW, blowing toward Philadelphia), such areas would constitute a large percentage of the total population dose (in the case of the TMI accident, for instance, Harrisburg contributed 25% of the total population dose despite the fact that most of the city is more than 10 miles from TMI). Since, as stated in NUREG-0654, the overall objective of emergency response plans is to provide dose savings for a spectrum of accidents, the urbanized areas in and around these heavily populated cities are concentrations of population for which emergency planning should be required as part of Plume Exposure EPZ. Philadelphia should be included in such plans.

(3) Use of the 10-mile circular EPZ does not take into account unique factors within the region, such as the rural-urban mix, automobile ownership, ownership of campers, vans and second homes, available public transportation, proportion of the population confined to institutions, location of friends and relatives, age of the population and proportion of children in the population, obstructions in the transportation network, and the extent of cooperation among local governments, and the attitude of people toward evacuation. At various locations within and outside of the now-designated EPZ, these factors will vary greatly. A basic tenet of successful emergency planning is to

avoid trying to change established patterns, attitudes and habits, to which people will cling during an emergency. All of the above factors must be investigated in detail and taken into consideration in deciding how large and what shape the Plume Exposure EPZ should be, especially in the case of Limerick and the unusually large population that will have to be protected during an accident.

(4) Applicant's Emergency Plan does not take into account the evacuation-shadow phenomenon, in which an order to evacuate or otherwise protect the population in a limited area due to a hazard such as a nuclear accident leads to spontaneous evacuation of a significantly larger area. The fact that the city of Philadelphia is downwind from Limerick makes spontaneous evacuation from the city a likelihood. The city is walled on its eastern border (the direction in which evacuation would occur, away from Limerick) by the Delaware River, over which are are very limited number access routes (escape routes) into New Jersey. This unique geographic situation means that it is especially important to plan for coping with spontaneous evacuation. The general planning assumption in NUREG-0654 that detailed emergency planning within an approximate 10-mile radius will provide a substantial base for expansion of response efforts in the event that this proves necessary, is pure folly in the case of Limerick.

## VIII-6. (LEA)

The evacuation time estimate study submitted by the Applicant as Appendix H of the Emergency Plan is deficient and inadequate.

Basis:

(a) The estimate fails to adequately account for the preparation time component of the total evacuation time, i.e., time required for shutting down factories, protecting livestock in farms, gathering of families (waiting for children to be transported to their homes from school), waiting in gasoline lines, etc. The study also fails to demonstrate that it has adequately accounted for the various social and economic characteristics of the population within the 10-mile EPZ, which is a function of urban traffic patterns, and which may materially affect preparation times. NUREG/CR-1745, BHARC-401/80-017.

(b) The study fails to justify the manner in which automobile occupancy was calculated in determining vehicle trips calculated for the time estimate; at \$3.2, the study merely assumes a figure of one vehicle per household, which may be unrealistic, and which is non-conservative. NUREG/CR-1745, BHARC-401/80-017.

(c) For the population centers divided by the 10-mile EPZ, while the study (p. 2-9) recites that "the inhabitants of those communities are included in the evacuation time estimates," the vehicle number calculated for those population centers is based only on the fraction of the inhabitants of the population center within the EPZ. (Example: Earl: total population of 2290,

population within the EPZ, 1146. The study assumes each household has one car. The number of cars for Earl is calculated in the study:  $1146/3 = 382$  households/cars. However, the actual car total for Earl should be  $2290/3 = 763$  households/cars.) Since the EPZ must be evacuated by population centers, all vehicles for the entire center must be included in the time estimates.

(d) The time estimates for many special institutions such as Graterford Prison, Pennhurst Center, Montgomery County Geriatric And Rehabilitation Center, assume and depend upon the availability within certain time periods of large numbers of buses for transportation. (e.g., 90 buses for Graterford within 4 hours and 15 minutes, 33 buses within 2 hours for Pennhurst).

LEA contends that there is no basis for concluding that such large numbers of buses will be available within the periods assumed, especially in view of the need for school buses to transport school children from the area.

(e) The time estimates for Pennhurst, the Montgomery County Geriatric Center, and local nursing homes and hospitals depend upon the rapid availability of numerous ambulances (e.g., Pennhurst, 76; MCGC, 20). LEA contends that there is no basis for concluding that such large numbers of ambulances will be available within the time periods required.

(f) The time estimate and evacuation provisions for Pennhurst Center are inadequate in that there is no description of or basis for the availability of escorts that will be

necessary for the clients, nor is there a demonstration of the existence of reception centers, which will also be necessary in view of the special institutional needs of the Pennhurst clients.

(g) The time estimates are deficient in that they rely upon either 1977 Delaware Valley Regional Planning Commission data or 1970 U.S. Census data, both of which are outdated.

VIII-7. (LEA, WHITE)

The Emergency Plan does not contain any offsite preparedness plans of State or local emergency response organizations. Therefore, the Applicant has not demonstrated compliance with 10 CFR §50.33(g), which requires such plans. There exists no basis upon which a finding under 10 CFR §50.47 can be made that (1) the state of offsite emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, and (2) that State and local emergency plans are adequate and capable of being implemented.

Petitioners reserve the right to review such plans when they are submitted, and to file contentions based upon the information contained therein.

BASIS: 10 CFR §§ 50.33(g), 50.47; Appendix E; NUREG-0654; Emergency Plan, Appendix G.

VIII-8. (LEWIS)

The Emergency Plan does not require administration of KI soon enough to assure the health and safety of the public.

BASIS: According to the FDA, "an important factor in obtaining satisfactory blocking of peak radioactive iodine

uptake is the temporal relation of stable iodide administration to radioiodine exposure." Background Material for the Development of the FDA Recommendations on Thyroid Blocking With KI, FDA HHS Publication 81-8158, March 1981, p. 2.

VIII-9 (WHITE)

As a person who works within the Plume Exposure EPZ and is subject, as part of my regular working conditions, to one or more of the following on a daily basis: traveling from job to job in a truck, on a unspecified route, to a destination or destinations not predetermined, without (and without access to) radio, telephone, or electricity (while working at each destination), often with little money and no food, I as an employee for a professional moving company am not provide adequate notification, shelter or evacuation as required by 10 CFR Part 50, Appendix E (part D, sections 2 and 3). Thus for me and others in my situation, the Applicant's Emergency Plan does not meet the requirements of NUREG-0654, Criterion E.6; Criterion G.1, 2 and 5; or Criterion J.10(c).

- BASIS: Appendix E, part D, sections 2 and 3; NUREG-0654, Criteria E.6, G.1,-2, and -5, and J.10(c).

VIII-10. (NLG)

The Emergency Plan prepared by the Applicant for the evacuation of the area surrounding the Limerick plants is inadequate as it relates to evacuation of the State Correctional Institution at Graterford.

BASIS: That portion of the Emergency Plan which concerns evacuation of the State Correctional Institution at Graterford, Appendix H, §4.1, states, inter alia, that:

1. Graterford Prison is an 1,800-inmate, maximum security, state prison facility.
2. It is located 8.3 miles from the Limerick plants.
3. The State Commissioner of Corrections estimates a total evacuation time of 5 hours and 30 minutes for Graterford if the evacuation order is given in the daytime.
4. This estimate assumes the availability of 90 buses.
5. If an emergency occurred at night, prisoners would not be moved outside the prison for security reasons.
6. If the order to evacuate is given just after sunset, the evacuation of Graterford would not occur until after sunrise.

On the basis of this plan, Petitioner contends that the plants pose a serious threat to the health, safety, and welfare of the Graterford inmates since it is apparent that even in daylight hours they would not be evacuated for over five hours after an evacuation order was issued. If such an order occurred immediately after sunset, evacuation would not occur until twelve hours later.

Furthermore, any evacuation is based on the assumption that there would be ninety buses available. There is no apparent basis for this assumption, giving rise to the inference that there may well be no evacuation whatever of Graterford in the event of an emergency.

The Applicant states in its Emergency Plan regarding Graterford that "[o]ther planning information and details are proprietary." Petitioner requests that this information be made available for

the purposes of developing this contention. Petitioner will use the discovery process to obtain this information.

Based on the inadequacy of the Emergency Plan as concerns Graterford inmates, Petitioner National Lawyers Guild, Philadelphia Chapter, on behalf of said inmates, requests that the operating licenses be denied until such time as Applicant develops an adequate Emergency Plan.

VIII-11. (ANTHONY)

There is a lack of emergency planning for the Valley Forge National Historic Park and the King of Prussia area.

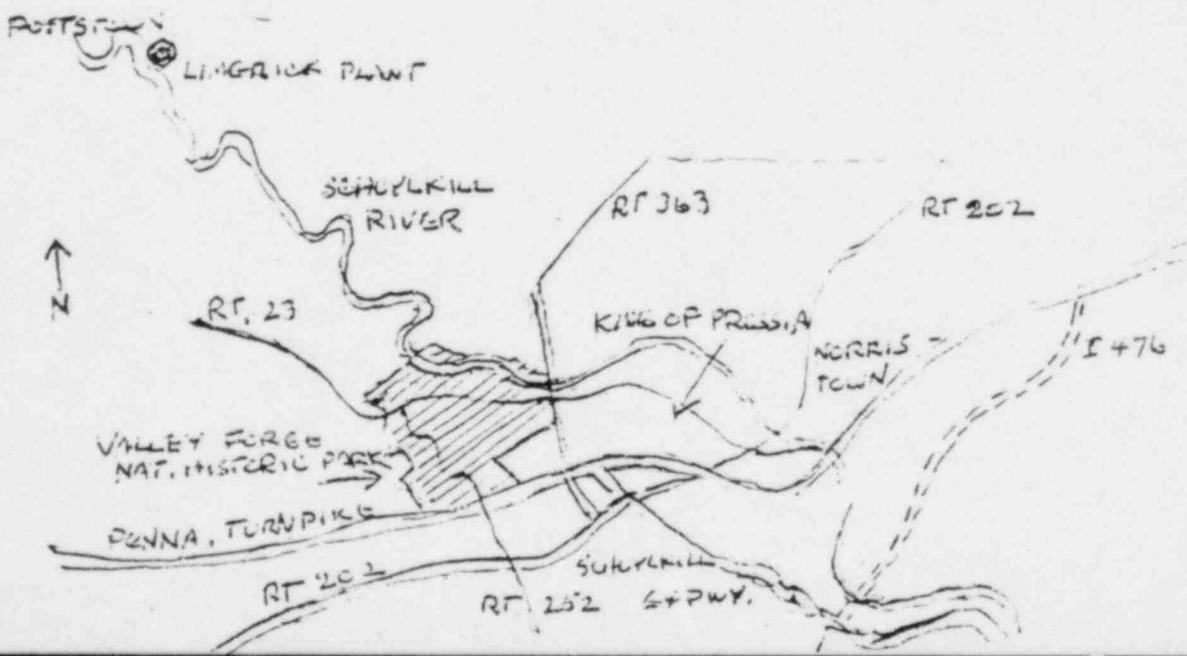
BASIS: This contention concerns the traffic and use patterns for Valley Forge Park and related commuter and shopping and business traffic to and from King of Prussia. All of this is dependent on and interrelated with the highway nexus which focuses long distance travel, medium distance and regional and local traffic on this spot.

Although King of Prussia comprises one of the most severe traffic concentrations within a radius of 30 miles from the Limerick nuclear site, it is also representative of perhaps fifty such concentrations within 30 miles where 3.8 million live and many more thousands travel for work, school, shopping, etc.

The effect of the operation of the Limerick plant and any accidental release of radioactivity on the people who live in and travel in and out of the thirty mile radius was not given significant consideration in PECO's decision to build that site. In PECO's application for an operating license, in-

adequate attention has been focused on the safety of those people and possible evacuation in case of a Limerick nuclear emergency. No study or emergency planning for the King of Prussia area or any other of the population concentrations in the thirty mile radius is seriously considered in the application. There should be no possibility of operating Limerick until the safety of the 7.2 million people in the entire 50 mile radius is assured in case of an accident.

To get an impression of the size of this responsibility, the traffic and use figures for Valley Forge Park are included, and the means of emergency exit are related to the use and peak congestion on the expressways and major highways adjacent to the park. The park records show the total use of the park by 11 1/2 million individuals in a year, including visitors, commuters, groups, and recreational users. Complete emergency plans must be in order, to protect these people. This fact has not been addressed by PECO, nor has the impact of Limerick on the park as a national historic monument. (see contention V-1.)



The diagram on the previous page shows the relation of Valley Forge Park to Limerick, King of Prussia, and highways. VALLEY FORGE PARK. The park is a national historic monument administered by the National Park Service under the Dept. of the Interior. The north edge of the park lies along the Schuylkill River, the south edge abuts the Pennsylvania Turnpike. It includes 2600 acres of rolling hills. Two state highways cut across the park, Rt. 23 in an east-west direction and Rt. 252 north and south. These are two-lane, high crown, winding, hilly roads only 25 feet in width. There is steady truck traffic along these roads and passenger vehicle use is continuous. The park guards are called often to pull trucks off the road when they break down on the steep grades. During the morning rush hours, traffic is frequently stalled by school busses. There is a SEPTA public bus line on Rt. 23. Serious accidents necessitate re-routing an average of 2-3 times a year.

The northern tip of Valley Forge Park is 10 miles southeast of the Limerick plant, and the southern tip on the river about 12 1/2 miles. The King of Prussia business, manufacturing and shopping area is almost contiguous to the east, at 13 to 15 miles from Limerick.

The park has five traffic counters at entrances to the park. The highest eastbound recording on Rt. 23 for 24 hours is about 9000 vehicles and the average annual daily is about 8000. Westbound the peak day is 6400 and the average 5500. The commuter traffic peaks from 6:30 to 8:30 in the morning and afternoon peak comes between 4:00 and 6:00. Sightseers and group visits to the park taper off in the fall and start

again in the spring. Recreational use of the park continues year round. School and other groups visiting the park reach a peak of 700 at any one time, with at least 20 busses in the parking lot. The majority of visitors enter at the main park entrance on the east.

EMERGENCY TRAFFIC. In case of a nuclear accident at Limerick there would be little chance to move vehicles in and out of the park except in the first few minutes after an alarm. Rts. 23 and 252 with only two narrow lanes would become choked almost immediately. Any vehicles reaching the PA Turnpike entrance or Rt. 202 would become immovable in a massive traffic jam which would extend all the way to Philadelphia, south, Rt #30 west, and Rt. 202 southwest. Traffic on the Turnpike would not move for miles both west and east. The same would be true of Rts. 202 and 363 east.

Up to now there is not emergency plan for evacuating Valley Forge Park. PECO has not made the attempt, perhaps in the belief that there is not plan that could work because there will be no roads free to travel on. The highest concentrations of traffic at King of Prussia occur early morning to mid-evening but heavy traffic continues steady during most of the night hours because of the interstate use. Traffic through the park to the King of Prussia shopping area continues during the evening and one weekends. The extent of this use is indicated by an increase from Sept. to Oct. of this year, of 33,000 vehicles, when a new shopping mall was opened.

Since the park is located in both Montgomery and Chester Counties, any emergency planning would have to be coordinated through two counties and the five townships involved. Although PECO is responsible for seeing that emergency plans are made, there is no way to provide for the safety of residents on the King of Prussia area or the users of the park except by removing the threat of a nuclear accident at Limerick. This means denying an operating license.

VIII-12. (LEA)

The Plan fails to demonstrate that primary responsibilities for emergency response by the nuclear facility licensee, and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuing basis, as required by 10 CFR § 50.47, especially in that the letters of agreement with other agencies, and support organizations having an emergency response role in the Plan fail to identify the exact emergency measures to be provided, the mutually acceptable criteria for their implementation, the arrangements for exchange of information, and the limits on their action. In addition, some letters of agreement have not been provided where they are required.

BASIS: 10 CFR § 50.47; Appendix E; NUREG-0654, Criterion A.3, p. 32; Emergency Plan, Appendix A..

## VIII-13. (LEA)

The LNGSEP fails to demonstrate that the on-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentations of response capabilities is available, and the interfaces among various onsite response activities and offsite support activities is specified, as required by 10 CFR § 50.47, especially in that:

(a) The Plan fails to specifically authorize, and impose the responsibility upon, the emergency coordinator ("Interim Emergency Director," LNGSEP § 5.2.1.1., "Emergency Director" § 5.2.1.2.) to provide protective action recommendations for authorities responsible for implementing offsite emergency measures.

(b) The Plan fails to establish a sufficient line of succession for the emergency coordinator position beyond the shift supervisor and assistant station superintendent (LNGSEP § 5.2.1.1., 5.2.1.2.), fails to identify the specific conditions for higher level utility officials assuming this function. Failure to establish a sufficient line of succession will cause chaos in the event of unavailability of the individuals listed, as the responsibilities of the interim emergency director and the emergency director are specifically not delegated to other segments of the emergency organization.

(c) The Alternate Site Emergency Coordinator (LNGSEP § 5.2.1.3.) is the station superintendent from Peach Bottom Atomic Power Station, an inadequate arrangement in view of the distance from Peach Bottom to Limerick, and in the absence of any showing that the Peach Bottom Station Superintendent is sufficiently familiar with the Limerick station to be effective upon his/her arrival at an emergency at Limerick.

(d) The staffing provisions (see LNGSEP Figures 5-1, 5-2, 5-5) fail to comply with the minimum staffing requirements set forth in NUREG-0654, Table B-1, in that there is no demonstration of the times and number of staff required for augmentation of the on-shift staff, and it is unclear whether a radiation chemistry technician will be on-shift, and whether two health physics technicians will be on shift.

(e) The responsibilities imposed upon the Interim Emergency Director in § 5.2.1.1. of the Plan (which are explicitly "not delegated to other segments of the emergency organization") are excessive and cannot reasonably be implemented by a single individual, and in fact, may require the physically impossible, e.g., "remain in the control room area," and "monitor the effects of the emergency."

#### BASIS

10 CFR § 50.47 (b) (2), Appendix E; NUREG-0654, Criteria B-2, B-3, B-4, B-5, Table B-1 (P. 37); LNGSEP §§ 5.2.1.1., 5.2.1.2., 5.2.1.3., Figures 5-1, 5-2, 5-5.

## VIII-14. (LEA)

The LNGSEP fails to demonstrate that procedures have been established for notification by the Applicant to State and local response organizations and for notification of emergency personnel by all response organizations; that the content of initial and follow-up messages to response organizations and the public has been established; and that means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established, as required by 10 CFR § 50.47

(b) (5), especially in that

(a) The plan fails to show whether, and how, the Applicant has established procedures which describe mutually agreeable bases for notification of response organizations consistent with its emergency classification and action scheme, and in fact, there is no indication in the plan that such procedures and mutually agreeable notification bases can, or do, exist;

(b) The plan does not set forth the content of initial and follow-up messages to response organizations and the public, and nothing in the plan demonstrates that appropriate content has been established;

(c) The plan fails to make adequate provisions for follow-up messages to offsite authorities in that the formats set forth in the LNGSEP fail to contain the information required by NUREG-0654, Criteria E. 4., p. 44, and the plan fails to demonstrate how adequate dose projections are to be carried out;

(d) The plan fails to demonstrate that the administrative or physical means exist for early notification and prompt and clear instructions to the public within the plume exposure pathway, or when such means will be in place.

(e) The Plan ignores the guidance of NUREG-0654, Appendix 1 in that the Plan at § 6.1.1 provides for "reasonable time" notification of offsite response organizations in the event of an "unusual event" classification, and specifies that "unusual events" taking place during the night shift need not be reported until the next working day. NUREG-0654, Appendix 1, p. 1-3, recognizing the necessity of prompt notification, requires that such notification take place within 15 minutes from the time at which operators recognize that events have occurred which make declaration of an emergency class appropriate.

#### BASIS

10 CFR § 50.47; Part 50 Appendix E; NUREG-0654, Criteria E.1, 3,4,6; Appendix 1; LNGSEP § 6.1.1, LNGSEP Appendix F.

VIII-15. (WHITE)

The effects of EMP (Electromagnetic Pulse) are known and have been known for many years. If EMP were to occur, it could interfere with the emergency planning notification system. The notification system (to response organizations as well as to the public) must be designed so that it is not vulnerable to EMP.

BASIS: Science Magazine, June 5 (p. 1116), June 12 (p. 1248), 1981; Science News, May 9 (p. 300), May 16 (p. 314), 1981.

VIII-16. (LEWIS)

The Limerick plant Emergency Plans are not adequate to protect the health and safety of the public.

BASIS: The requirement that Reactor Operators (ROs) contact offsite management before declaring an evacuation emergency renders the emergency plans unworkable. At 3AM in the morning, the plant operator would have to telephone the management in case of an emergency. (Verbal communication, Bob Searles, NRC, to Lewis.) If this emergency were a major breach of containment, minutes would be precious. Many of these minutes would be lost in contacting of offsite management. The phone numbers of offsite management are confidential. Also, those phone numbers are not published in the public copies of Emergency Plans. The requirement to contact offsite management and unavailability of their phone numbers are barriers to implementation of emergency plans.

VIII-17. (LEA)

The LNGSEP fails to demonstrate that provisions exist for prompt communications among principal response organizations to emergency personnel and to the public, as required by 10 CFR § 50.47 (b) (6) especially in that

(a) The Plan fails to establish reliable primary and backup means of communication for the applicant, state and local

response organizations, except for backup radio communication between the control room and Montgomery County Office of Emergency Preparedness, and backup power for the PABX telephone system described in § 7.2.2 of the Plan;

(b) There is no demonstration in the Plan that the communications systems established for the response organizations are compatible with one another;

(c) It does not appear that the plan contains any provision for a communications link between NRC headquarters and NRC Regional Office Emergency Operations Center and the radiological monitoring team assembly area;

(d) The Plan does not demonstrate that the applicant has ensured the existence of a coordinated communications link for the fixed and mobile medical support facilities;

(e) the provision for testing of the communications system is inadequate, in that (1) the frequency of the testing set forth at § 8.1.2.5 of the Plan does not meet or exceed the criteria of NUREG-0654, Criteria F.3 and N.2(a); (2) the communications drills do not require the aspect of understanding the content of messages; (3) there is no provision for testing of the communications system between organizations other than those specified in § 8.1.2.5 of the Plan, thus failing to constitute a test of the entire emergency communications system, as required by NUREG-0654, Criterion F. 3.

BASIS

10 CFR § 50.47 (b) (6); Part 50, Appendix E; NUREG-0654,  
Criteria F.1, 2, 3 & N.2(a); LNGSEP § § 7.2.2; 8.1.2.5.  
VIII-18. (LEA)

The Emergency Plan fails to establish that information will be made available to the general public on a periodic basis on how they will be notified and what their initial actions should be in an emergency, or that procedures for coordinated dissemination of information to the public have been established, as required by 10 CFR §50.47(b)(7), in that no provisions for any information dissemination to the public appear in the Plan at all, nor are there plans for programs to acquaint new media with the emergency plans.

LEA reserves the right to review such provisions and procedures when they are submitted by the Applicant and to file contentions based on the information contained therein.

BASIS: 10 CFR §50.47(b)(7); Appendix E; NUREG-0654, Criteria G.1, 2 and 5.

## VIII-19. (LEA)

The assessment actions set forth in § 6.2 of the Plan fail to establish adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition, (as required by 10 CFR § 50.47 (b) (9), especially in that the Applicant has not established

(a) The kinds of monitoring instruments being used and their capabilities;

(b) Adequate onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident;

(c) Adequate methods and techniques to be used for determining the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors;

(d) The capability of acquiring and evaluating meteorological information sufficient to meet the criteria of Appendix 2 to NUREG-0654; provisions for access to meteorological information by the Emergency Operations Facility, and the Technical Support Center; availability to the Commonwealth of Pennsylvania of suitable meteorological data processing interconnections which permit independent analysis by the Commonwealth of Pennsylvania;

(e) The methodology for determining the release rate/ projected doses if the instruments used for assessment are off scale or inoperable;

(f) The specific capability and resources for field monitoring within the plume exposure EPZ;

(g) That each organization has adequate capability to detect and measure radioiodine concentrations in air in the plume exposure EPZ as low as  $10^{-7}$  u Ci/cc under field conditions, and that any interference from the presence of noble gases and background radiation will not decrease the stated minimum detectable activity, as required by NUREG-0654, Criteria I. 9., p. 58.

(h) That each organization has established means for relating the various measured parameters to dose rates for key isotopes, and gross radioactivity measurements, and to show that provisions have been made for estimating the integrated doses from the projected and actual dose rates, and for comparing these estimates with the protective action guides, as required by NUREG-0654, Criteria I., 10, p. 58.

#### BASIS

10 CFR § 50.47 (b) (9), Part 50, Appendix E; NUREG-0654, Criteria I. 1-10 inclusive; LNGSEP § 6.2.

## VIII-20. (LEA)

The LNGSEP fails to demonstrate that adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition will be in use by the Applicant, as required by 10 CFR § 50.47 (b) (9) especially in that

(a) The Plan fails to specify with adequate particularity the plant system and effluent parameter values characteristic of an adequate spectrum of off-normal conditions and accidents, as required by NUREG-0654, Criterion I. 1;

(b) The Plan fails to demonstrate that adequate arrangements have been made to locate and track an airborne radioactive plume emanating from the plant, as required by NUREG-0654, Criterion I.11.

BASIS

10 CFR § 50.47 (b); Part 50, Appendix E; NUREG-0654, Criteria I .1, 11.

## VIII-21. (LEA)

The Plan fails to demonstrate establishment of a mechanism for recommending protective actions by the Applicant to the appropriate State and Local authorities, or for prompt notification directly to the offsite authorities responsible for implementing protective measures within the plume exposure EPZ, as required by NUREG-0654, Criteria J. 7, p. 60. For the Applicant to abandon this responsibility

and to place the duty for protective action recommendations with PEMA will require that plant and release information be transmitted to Pa. BRP, who will be required to transpose the data into information useful to PEMA, which will then be required to make recommendations. This process will involve unnecessary delay in implementing protective actions. Further, the Plan fails to provide for prompt notification directly to offsite response authorities, and instead provides for a circuitous path of notification.

Inasmuch as the Plan fails to address the required mechanism for the Applicant's recommendations for protective action, the Plan fails further to set forth the required bases for a choice of recommended protective actions for the plume exposure pathway under emergency conditions as required by NUREG-0654 Criterion J. 10 (m). Intervenor contends that the Applicant must specify in the plan an adequate mechanism for making protective action recommendations to appropriate State and Local authorities, and must establish adequate bases for such recommendations.

BASIS

10 CFR § 50.47 (b) (10); Part 50, Appendix E; NUREG-0654, Criteria J. 7 and 10

VIII-22. (LEA)

The city of Philadelphia lies well within the 50-mile "Ingestion Exposure Pathway" EPZ for Limerick, which means that protective measures must be planned and implemented to prevent radionuclide contamination of food and water supplies in the event of an offsite radiation release.

The city of Philadelphia pumps approximately 60% of its water from the Delaware River and the other 40% from the Schuylkill. This water is provided to residences, businesses and public facilities such as hospitals and schools for necessary drinking water and for other human uses.

Since 100% of Philadelphia's water is obtained from surface rather than groundwater sources, the health and safety of all Philadelphia residents will be directly and immediately threatened by any significant releases into the air. LEA contends that it is not possible to protect surface waters of the two rivers from atmospheric releases. Therefore protective actions for the ingestion exposure pathway EPZ appropriate to Philadelphia cannot be developed, as required by 10 CFR §50.47(b)(10).

BASIS: Feb. 25, 1980 Engineering Report, City of Philadelphia Water Dept (Water and Sewer Revenue Bonds Sixth Series); 10 CFR §50.47(b)(10).

## VIII-23. (LEA)

The LNGSEP fails to demonstrate that adequate arrangements have been, or will be made, for medical services for contaminated injured individuals, as required by 10 CFR § 50.47 (b) (12), in that:

(a) While a wide spectrum of available medical services is described in Sections 5.3.2.1 - 5.3.2.5 of the Plan, it has not been demonstrated that these services and facilities are adequate for the potential number of persons contaminated by the spectrum of credible accident scenarios described in the Limerick Probabilistic Risk Assessment;

(b) The Plan does not demonstrate that the Applicant has arranged adequate transportation of victims of radiological accidents to medical support facilities, as required by NUREG-0654, Criteria L.4. The Applicant's provisions as described in § 6.5.3 of the Plan fail to demonstrate the availability of sufficient ambulance service, and shielding for such service, in view of the potential number of contaminated persons. Further, Intervenor contends that the Plan's authorization of transport of injured and contaminated persons by privately owned vehicles is inadequate, especially in view of the Plans' use (§6.4.1.1. (e)) of privately owned vehicles for evacuation of personnel who will require these vehicles for evacuation of their families.

BASIS

10 CFR § 50.47 (b) (12); Part 50, Appendix E; NUREG-0654 Criteria L .1, 4, LNGSEP § 5.3.2.1 - 5.3.2.5; 6.5.3; 6.4.1.1. (c).

## VIII-24. (LEA)

The LNGSEP fails to demonstrate that adequate radiological emergency response training will be provided to those who may be called upon to assist in an emergency, as required by 10 CFR § 50.47 (b) (15), in that:

(a) There is no evidence in the Plan of any commitment by all of the offsite response organizations to participate in and receive such training;

(b) There is no commitment in the Plan by the Applicant to provide adequate training to offsite organizations (except for a brief reference in § 8.1.1 that training will be offered to ambulance, physicians, and fire company who may enter the site);

(c) The training programs in the Plan are not sufficiently described to assume compliance with the guidance of NUREG-0654, Criteria 0.2, 4.

Intervenor requests access to all training materials to be used for the purpose of compliance with 10 CFR § 50.47 (b) (15) as soon as available, and reserves the right to file contentions based upon the information contained therein, including contentions placing in issue the adequacy of such training materials.

BASIS

10 CFR § 50.47 (b) (15); Part 50, Appendix E; NUREG-0654, Criteria 0.1, 2, 4; LNGSEP § 8.1.1, Table 8-1.

## VIII-25. (LEA)

The LNGSEP fails to demonstrate that adequate emergency facilities and equipment to support emergency response are provided and maintained as required by 10 CFR § 50.47 (b) (8), especially in that:

(a) The documents to be supplied in or made accessible to the Technical Support Center (see LNGSEP § 7.1.3) are inadequate to properly perform the function of the center in that they fail to include copies of plant operating records, and plant operations reactor safety committee records and reports (see NUREG-0814, p. 2-15), which records may be vital in determining the plant-specific behavior of equipment; they also fail to include documentation for procedures to access and use the system for remote interrogation of atmospheric measurements and predictions.

(b) The LNGSEP's descriptions of the Remote Emergency Control Center (Plan § 7.1.2), the Technical Support Center (Plan § 7.1.3), the Operational Support Center (Plan § 7.1.4), and emergency equipment and supplies are all insufficient to meaningfully assess compliance with 10 CFR § 50.47 (b) (8) or to evaluate the facilities with the criteria of NUREG-0654, and functional criteria of NUREG-0696 pp. 8-14 (e.g., whether the Emergency Control Center will be habitable throughout the entire course of an accident.) Intervenor contends that the applicant has not demonstrated that the facilities proposed are adequate.

(c) The LNGSEP fails to set forth the procedures for or manner of maintenance of the emergency facilities so as to preclude degradation of facility effectiveness, which maintenance is required by 10 CFR § 50.47 (b) (8).

(d) The plans' provisions for semi-annual inspection, inventory and operational check of emergency equipment/instructions violate the quarterly frequency guidance of NUREG-0654, Criteria H. 10, without justification.

BASIS

10 CFR § 50.47 (b) (8); Part 50, Appendix E; NUREG-0654, Criteria H. 1, 2, 9, 10; NUREG-0696 pp. 8-14; NUREG-0814, pp. 2-15. VIII-26. (LEA)

The LNGSEP fails to demonstrate that responsibilities for plan development and review and for distribution of emergency plans are established and planners are properly trained, as required by 10 CFR § 50.47 (b) (16), in that:

(a) It does not appear that the Applicant has provided for proper training for the individuals involved in the planning effort. The Plans' provisions for training of Applicant's staff set forth in Table 8-1 appear to be provisions for training for implementation of the Plan, and there is no indication that Planners will be trained or qualified as such;

(b) The Plan fails to commit the Applicant to review and certify its plans as current on an annual basis. While the Applicant's plan provides for an annual review of the Plan at § 8.2.1 of the Plan (p. 8-5), § 8.2.4 of the Plan (p. 8-7) provides for a review of the Agreement Letters only every two years, and fails to require annual positive certification of current status;

(c) The Applicant has not provided for the updating of telephone numbers in emergency procedures on at least a quarterly basis, as required by NUREG-0654, Criteria P. 10;

(d) implementing procedures of the Plan are not attached as an Appendix to the Plan. Intervenor requests access to the implementing procedures, required by Appendix E, Section V, as soon as available;

(e) The Plan fails to demonstrate that the organization or persons responsible for annual review of the emergency preparedness for the Applicant are independent, and that the results of such review and recommendations will be reported to all involved federal, state and local organizations, and retained for five years, or required by NUREG-0654, Criteria P. 9.

BASIS

10 CFR § 50.47 (b) (16); Part 50, Appendix E; NUREG-0654, Criteria P. 1, 4, 7, 9, 10; LNGSEP § 8.2.1, 8.2.4.

## VIII-27. (LEA)

The LNGSEP fails to demonstrate that arrangements for requesting and effectively using assistance resources have been made, and other organizations capable of augmenting the planned response have been identified as required by 10 CFR § 50.47 (b) (3), especially in that:

(a) The Plan does not properly incorporate Federal response capability into its operation plan, as it does not specify the persons by title authorized to request Federal assistance, does not specify the Federal resources expected, including estimated arrival times at Limerick, nor does it specify the licensee, state and local resources available to support the Federal response;

(b) The Plan does not sufficiently describe the radiological laboratory capabilities of the on-site support center facilities (LNGSEP §7.1.5 (e)), or the expected response time for the RMC health physics capabilities set forth at § 5.3.2.1. of the LNGSEP;

(c) In the case of a general emergency, a number of the local support agencies relied upon for assistance will be incapable of providing the assistance described in the letters of agreement made with the applicant.

(d) Some of the organizations relied upon to provide emergency response have failed to identify, and provide letters of agreement with, the other organizations which may be relied upon in an emergency to provide assistance (particularly those local agencies and private sector organizations whose limited capabilities may be overwhelmed by a nuclear accident, and who therefore would be unable to adequately respond alone, , as required by NUREG-0654, Criteria C. 4, P. 41.

BASIS

10 CRF § 50.47; Appendix E.; NUREG-0654, Criteria C.1 (a-c), C. 3; LNGSEP § § 7.1.5(e), 5.3.2.1

VIII-28. (LEA)

The Emergency Plan fails to demonstrate that an adequate range of protective actions has been developed for the Plume Exposure Pathway EPZ for persons onsite, as required by 10 CFR §50.47 (10), in that

(a) The Plan fails to demonstrate that the Applicant has made sufficient provisions for evacuation routes and transportation for onsite individuals to a suitable offsite location, including alternatives for inclement weather, high traffic density, and specific radiological conditions, as required by NUREG-0654, Criterion J. 2., especially in that no routes have been designated in the Plan, no suitable offsite location has been designated, no alternatives for any contingencies have been established, and all individuals at the plant are expected to use their own cars to evacuate, which is

an inadequate arrangement;

(b) The Plan fails to establish that the Applicant has provided for adequate radiological monitoring of people evacuated from the site, as required by NUREG-0654, Criteria J. 3, p. 59, especially in that the plans do not reflect the time within which the taking of whole body counts, and the processing of dosimetric devices of evacuees, can be completed, nor do the plans indicate that all plant personnel, visitors, construction workers, etc. who may be exposed to radioactivity during an accident will have possession of dosimetric devices, nor do the plans indicate, when and how techniques will be established which will provide data for estimating neutron dose where suspected;

(c) While applicable guidance (NUREG-0654 , Criterion J. 4.) requires that the Applicant must provide for the evacuation of onsite non-essential personnel in the event of a site or general emergency, the Plan fails to make any distinction between "essential" and "non-essential personnel", and it is unclear how the Applicant will administratively enforce such a distinction;

(d) The Plan fails to provide adequate decontamination capabilities at the point of radiological monitoring, as required by NUREG-0654, Criterion J. 3, 4;

(e) The Plan fails to demonstrate a capability within 30 min. to account for all individuals onsite at the time of an emergency, as required by NUREG-0654, Criteria J. 5.

BASIS: 10 CFR §50.47(b)(10); Appendix E; NUREG-0654 Criteria J.2, 3, 4, 5.

## VIII-29. (LEA)

The LNGSEP fails to demonstrate that adequate means for controlling radiological exposures in an emergency have been established, and that such means include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides, as required by 10 CFR § 50.47

(b) (11) in that:

(a) The Emergency Occupational Exposure Criteria of Table 6-1 of the LNGSEP are inadequate, and do not establish onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides for removal of injured person, assessment actions, providing first aid, performing personnel decontamination, providing ambulance service and providing medical treatment services; it further leaves such exposure up to the judgment of the individual;

(b) The Plan fails to meet the guidance of NUREG-0654 Criteria K. 2., without justification, in that it fails to set forth advance procedures for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities, which procedures must include expeditious decision-making and a reasonable consideration of relative risks, especially in that no advance procedures have been established at all, no reasonable consideration of relative risks has been made, and other than the impermissibly vague guidance of Table 6-1, the determination of exposure limits is left utterly to the individual.

(c) It is not demonstrated that emergency workers will have sufficient information concerning radiation risks upon which to make any informed judgment regarding radiation exposure, although the plan leaves exposure limits to the individual;

(d) The Plan fails to establish that the Applicant has made provisions for 24 hour-per-day capability to determine the doses received by emergency workers involved in an accident at Limerick, has made provisions for distribution of sufficient dosimeters, has ensured that the dosimeters are read at appropriate frequencies, and that dose records are maintained, as required by NUREG-0654, Criteria K. 3. (a) (b);

(e) The Plan fails to establish that the Applicant has specified action levels for determining the need for decontamination, or has established adequate means for radiological decontamination of emergency personnel wounds, supplies, instruments, equipment, and for waste disposal as required by NUREG-0654, Criteria K. 5, in that the action levels are to be determined in emergency implementing procedures which have not yet been established, and the decontamination capabilities are not described with sufficient detail to assess their adequacy. Intervenor requests access to the implementing procedures as soon as available, and reserves the right to file contentions based upon the information set forth therein.

(f) The Plans fail to demonstrate that the Applicant has established procedures for, and capability for, onsite contamination control measures, including area access control, drinking water and food supplies, and criteria for permitting return of areas and items to normal use, all as required by NUREG-0654, Criteria K. 6., p. 67. The Plan provides that some of these matters will be addressed by implementing procedures (See Plan, § 6.4.3.1.) but no procedures have yet been submitted by the Applicant. Intervenor requests access to the implementing procedures as soon as available, and reserves the right to file contentions based upon the information set forth therein.

(g) The Plans fail to demonstrate that the Applicant has established the capability for decontaminating relocated onsite personnel, including provision for extra clothing, and decontaminants suitable for expected contamination, including radioiodine contamination of the skin, as required by NUREG-0654, Criteria K. 7., p. 68, especially in that the quantity of extra clothing is nowhere mentioned in the equipment lists set forth in the plans, and while mention is made of "decontamination chemicals", these are not described sufficiently to ascertain effectiveness for radioiodine skin contamination.

#### BASIS

10 CFR § 50.47 (b) (11); Part 50, Appendix E; NUREG-0654, Criteria K. 1, 2, 3, 5, 6, 7; EPA Emergency Worker and Lifesaving Activity Protective Action Guides (EPA 520/1-75/001); LNGSEP, §§ 6.5.9., 6.5.1., 6.5.2., 7.1.5 (c), Table 6-1, 6.4.3.1.

## VIII-30. (LEA)

The LNGSEP fails to establish that the Applicant has developed adequate plans for recovery and re-entry as required by 10 CFR § 50.47 (b) (13), in that:

(a) The Applicant's "plans" consist merely of a string of titles and personnel functions (Plan, §§ 5.4.1 -- 5.4.11) without any evidence of any plans or procedures to guide these functions. Section 9 of the LNGSEP submitted to date indicates that recovery and re-entry plans have not yet been developed;

(b) The Plan fails to describe the means by which decisions to relax protective measures will be reached, considering both existing and potential conditions;

(c) The Plan fails to specify the method to be used for periodically estimating the total population exposure.

BASIS:

10 CFR § 50.47 (b) (13); Part 50, Appendix E; NUREG-0654, Criteria M. 1, 4.

## VIII-31. (LEA)

The LNGSEP fails to demonstrate that adequate periodic exercises will be conducted to evaluate major portions of emergency response capabilities, periodic drills will be conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills will be corrected, as required by 10 CFR § 50.47 (b) (14), in that:

(a) The Plan fails to demonstrate that the Applicant has made provisions for an exercise starting between 6:00 P.M. and midnight, and another between midnight and 6:00 A.M. once every six years, and for the conduct of unannounced exercises, as required by NUREG-0654, Criterion N. 1. (b).

(b) The Plan provision for testing of communications is inadequate, in that the guidance of NUREG-0654 Criterion N. 2. (a) requires monthly testing of communications with state and local governments within the plume exposure EPZ, whereas § 8.1.2.5 of the Plan provides for such testing only semi-annually, and the guidance requires quarterly testing of communications with Federal emergency response organizations and states within the ingestion exposure EPZ, whereas § 8.1.2.5 of the Plan provides for such testing only once during the calendar year;

(c) The Plans fail to comply with NUREG-0654, Criteria N. 2. c., p. 72, in that the guidance requires the conduct of an annual medical emergency drill, whereas § 8.1.2.3 of the Plan provides for such drills every two years;

(d) The Plans fail to demonstrate that either the Applicant or the Commonwealth of Pennsylvania will conduct semi-annual health physics drills which involve response to and analyses of, simulated elevated airborne and liquid samples and direct radiation measurements in the environment, as required by NUREG-0654, Criteria N. 2. (e) (1), p. 73;

(e) The Plans fail to demonstrate that the Applicant will annually include in the health physics drills required analysis of inplant liquid samples with actual elevated radiation levels including use of the post accident sampling system, as required by NUREG-0654, Criteria N. 2. (e) (2), p. 73;

(f) Inasmuch as no exercise scenarios have been submitted by either the Applicant, or state or local emergency response organizations, the Plans fail to demonstrate that such scenarios comply with the requirements of NUREG-0654, Criteria N.3., p. 73-74;

(g) The Plan's provisions for maintaining emergency preparedness fail to properly distinguish between "exercises" and "drills", and fail to provide that the drills required by NUREG-0654, Criteria N. 2. (a) (e) will be held in addition to an annual exercise, as the guidance requires, but instead provides that "scenarios may be developed in such a manner as to accomplish more than one periodic requirement" (Plan § 8.1.2);

(h) The Plan's provisions for annual "drills" fail to set forth whether the local emergency response organizations will be required to be activated, thus constituting an actual exercise of the integrated emergency response capability, or whether the local emergency response organizations will merely be notified by the Applicant, thus constituting only a test of the communications system. This violates the guidance of NUREG-0654, Criterion N. 1. (b), which requires that an exercise "shall include mobilization of . . . local personnel and resources adequate to verify the capability to respond to an accident scenario requiring response."

BASIS

10 CFR § 50.47 (b) (14); Part 50, Appendix E; NUREG-0654, Criteria N. 1, 2, 3; LNGSEP §§ 8.1.2.2.; 8.1.2.3; 8.1.2.5.

CERTIFICATE OF SERVICE

DUPLICATE  
USNRC

'81 NOV 27 P3:46  
*CR*

I hereby certify that copies of the foregoing Supplemental Petition of Coordinated Intervenors have been hand delivered to the following on Nov. 24, 1981:

- 1) Lawrence Brenner, Chairman  
Administrative Judge  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555
- 2) Dr. Richard F. Cole  
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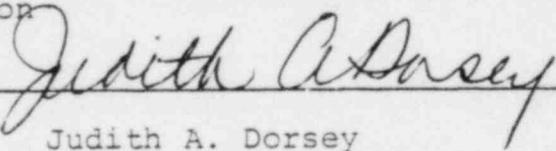
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