

# AIR and WATER Pollution Patrol

BROAD AXE, PA.

July 12, 1983

Conner & Wetterhahn  
1747 Pennsylvania Ave., N.W.  
Washington, D.C. 20005

Gentlemen:



In The Matter Of  
PHILADELPHIA ELECTRIC COMPANY  
LIMERICK GENERATING STATION, UNITS 1 AND 2  
Docket Nos. 50-352 and 50-353

INTERVENOR AIR & WATER POLLUTION PATROL (ROMANO)  
FORMAL DISCOVERY REQUESTS OF  
PHILADELPHIA ELECTRIC COMPANY (APPLICANT)

Pursuant to the Rules of Practice of the Nuclear Regulatory Commission ("NRC"), 10 C.F.R. 2.740b, and the Atomic Safety and Licensing Board's Memorandum and Order Confirming Schedules Established During Prehearing Conference (May 16, 1983), Air & Water Pollution Patrol (AWPP) hereby requests the following to be answered fully in writing, under oath, in accordance with the definitions and instructions below.

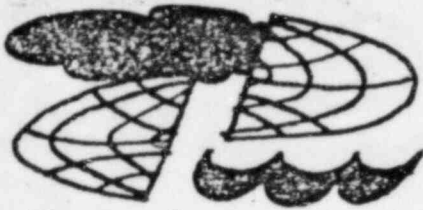
## Instructions

For each answer, please state the full name, work address, and title or position of each person providing information for the answer to the interrogatory.

These questions require all knowledge and information in Applicant's possession and/or knowledge and information in the possession of Applicants agents, representatives, consultants, and, unless privileged, attorneys.

## Questions

1. State whether you intend to present any expert witnesses on the subject matter at issue in Contention V-4. If so, identify each such expert witness and further state (a) his professional qualifications; (b) the subject matter on which the expert is expected to testify; (c) the substance of the facts and opinions to which the expert is expected to testify; (d) the grounds



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Intervenor AWPP (Romano) formal Discovery Requests of P.E. contd.

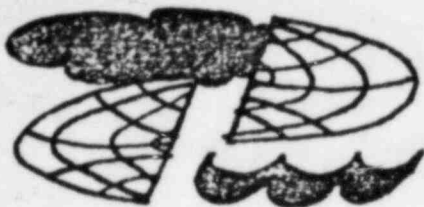
for each opinion. Identify by court, agency, or other body, each proceeding in which such individual rendered testimony on this (these) subject (s).

2. Identify by title, author, publisher and date of issuance or publication, all documents that you rely upon as a basis for your contention or that you intend to use (by way of reference or evidentiary proffer) in presenting your direct case on Contention V-4 and all documents to which you intend to refer in conducting cross-examination of other witnesses who may testify in connection with any such contention(s).

3. To the extent that your answer to any question is based upon one or more documents, (a) identify each such document on which your answer is based; (b) identify the specific information in such document upon which you rely; (c) explain how such information provides a basis for your answer.

4. To the extent that your answer is based upon any study, calculation, research or analysis, (a) describe the nature of the study, calculation, research or analysis and identify any documents which discuss or describe the study, calculation, research or analysis; (b) identify the person (s) or entity (ies) who performed the study, calculation, research or analysis; (c) describe in detail the information which was the subject of the study, calculation, research or analysis; (d) describe the results of such study, calculation, research or analysis; (e) explain how such study, calculation, research or analysis provides a basis for your answer.

5. To the extent that your answer is based upon conversations, consultations, correspondence or other communications with one or more individuals or entities, (a) identify each such individual or entity; (b) state the educational and professional background of each such individual, including occupation and institutional affiliations; (c) describe the nature of each communication, including time and context, and describe the information received from each such individual or entity; (e) explain how such information provides a basis for your answer.



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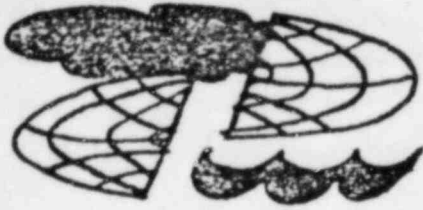
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Intervenor AWPP (Romano) Formal Discovery Requests of P.E. contd.

## Contention V-4

- (a) Did Applicant determine how many single engine aircraft use the twelve airports within 10 miles of Limerick per year?
- (b) Did Applicant calculate how many single engine aircraft use the radio-guide VOR 116.5 approximately 1 mile from the reactor?
- (c) Did Applicant determine how many student pilots; how many first year pilots; how many pilots that fly less than one hour per week; less than average of  $\frac{1}{2}$  hour per week; less than average of  $\frac{1}{4}$  hour per week on a year's basis at the twelve airports within 10 miles of Limerick?
- (d) At what throttle RPM is Carburetor ice (and throttle ice) most likely to occur when dew point and air temperature are within  $5^{\circ}\text{F}$  between  $32^{\circ}\text{F}$  and  $65^{\circ}\text{F}$  with  $\frac{1}{2}$  saturated and near saturated air?
- (e) Has Applicant obtained data relating to the instrumentation or indicators available to the pilots referred to in (a), (b), and (c) above?
- (f) Has Applicant determined what % of single engine airplanes that fly in the Limerick area or otherwise have instrumentation or indicators available to the pilot?
- (g) What plume studies has the applicant made including width, length, grams of water per cubic meter, and obstruction of view within the plume at different lengths, widths, and water vapor per cubic meter?
- (h) The Applicant has used the Johns Hopkins University Applied Physics Laboratory (JHU/APL) studies as indicated by "Cooling Tower Plume-Indicated Flight Hazards". These studies as stated in Chapter V, P.5-1 show results are invalid near traffic patterns (as exist at Limerick). On what basis, then, does Applicant overcome the use of a study that states it cannot apply to Limerick?



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Intervenor AWPP (Romano) Formal Discovery Requests of P.E. contd.

- (i) In JHU/APL report "worst condition" air moisture concentration is stated to be 1 gram of moisture per cubic meter of air. How many cubic meters of air will develop "worst condition" concentration as a result of release of 35 million gallons of water, as vapor, from the Limerick tower per day?
- (j) Did Applicant study when air is at 0.9 grams of moisture per cubic meter, how many cubic meters of air will attain "worst condition" status by addition of 35 million gallons of water as vapor per 1 day; per 2 days; per 3 days?
- (k) What Staff questions were asked of the Applicant relative to carburetor ice potential in aircraft passing through or near the Limerick cooling tower plume in marginal VFR conditions? What were the answers the Applicant gave in each case?
- (l) Did Applicant (P.E.) or its representatives perform quantitative analyses on effect of saturated air (visible and invisible) on carburetor ice potential in the 1 mile; 2 mile; 3 mile; 4 mile; 5 mile area surrounding the Limerick reactor as affected by the addition of 35 million gallons of water, per day, as vapor? Did Applicant study potential re above question for carburetor ice in naturally saturated VFR conditions, with stagnant no-wind condition and compounding of 35 million gallons of water per day, for three or four days with temperatures between 32° F and 65° F?
- (m) Further since carburetor ice potential is proportional to degree of saturation of the atmosphere at temperatures between 32° F and 65° F or more, did P.E. do studies re number of days in the past ten (10) years during which the dew point was 5° F lower than the air temperature?
- (n) Did P.E. calculate the number of days in the past ten years in the Pottstown-Limerick area when cloud ceiling was 1000 feet, 1200 feet, 1500 feet, and visibility was 4 miles, 3½ miles, 3 miles?
- (o) Did P.E. do quantitative studies which indicated there would be no potential for carburetor ice (or other adverse effect re flying hazard) from accumulation of 35 million gallons as water per day of moisture from the





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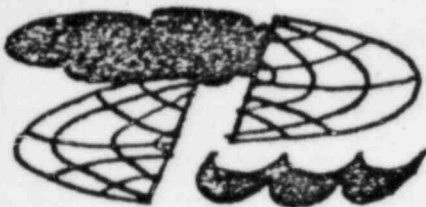
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Limerick towers under no-wind naturally saturated conditions present 2, 3, 4, days or more in a row from February through April and from September through November.

- (p) The U.S. Federal Aviation Administration's Department of Transportation flyer re Advisory Circular AC-00-6, "Aviation Weather" (U.S. Government Printing Office) states the basic requirements for a thunder storm and its hazardous effects such as wind shear are: (1) Unstable air, (2) an initial updraft, and (3) high moisture content as with 35 million gallons of water as vapor at approximately 112°F rising rapidly. Did P.E. do studies that prove the cooling towers do not initiate conditions conducive to wind shear and thunder storms?
- (q) Has P.E. contacted the operators of the twelve airports--in particular Pottstown-Limerick, Pottstown Municipal and Perkiomen Valley airports relative to the potential for carburetor ice and shear as a result of both visible (on marginal VFR days) and invisible plume, in particular on full VFR days?
- (r) Did P.E. study how many days during 1980, 81, or 82 that the dew point conditions were reached within 1,3,5,7,10 miles from Limerick?
- (s) Did P.E. study how many days during 1980,81, or 1982, the dew point was within 1,3,5,7 degrees F of the air temperature in the Limerick area?
- (t) Re (r) and (s) above, did P.E. quantitate the grams of moisture per cubic meter of air on days when dew point was within 1,3,5, degrees F of air temperature and on days when air is stagnant and saturated, how much moisture is added per liter in a volume of air 1,000feet high and 1 mile square with tower water vapor releases accumulating 1,2,3,4,5, and 6 days.
- (u) I repeat this question since Applicant did not answer when submitted in September 3, 1982 interrogatory. Did P.E. study the "chimney" effect caused by rising hot moist air from the cooling towers to cause descending air currents to create wind shear in the Pottstown-



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Limerick area to augment carburetor ice danger?

- (v) Did P.E. purchase the Pottstown-Limerick airport in order to control movement of aircraft in the immediate airspace, for hazzard considerations, or otherwise?
- (w) Does P.E. intend to change or limit access to the Pottstown-Limerick airport by pilots and aircraft as compared to previous owners?

Very truly yours,

Frank R. Romano, Chairman

Air & Water Pollution Patrol  
61 Forest Ave.  
Ambler, Pa. 19002

FRR/jch

I hereby certify that copies have been served by First Class Mail to: Lawrence Brenner; Richard F. Cole; Peter a. Morris; Atomic Safety and Licensing Appeal Panel; Docketing and Service Section; Ann P. Hodgdon, Elaine I Chan; Atomic Safety and Licensing Board Panel; Philadelphia Electric Company, Edw. G. Bauer; Mark J. Wett-  
erhahn & Troy B. Conner; Robert L. Anthony; Marvin I Lewis; Office of Inspection and Enforcement; Judith A. Dorsey; Jackie Ruttenburg, Keystone Alliance\*; Thomas U. Au\*; Thomas Gerusky\*; Walter W. Cohen\*; Managing Director City of Phila.\*; Steven P. Hershey\*; Donald S. Bronstein\*; Joseph White\*; Dr. Judith Johnsrud\*; Robert J. Sugarman\*; James M. Neill\*; Director PEMA\*.

\* without enclosure