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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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Before the Atomic Safety and Licensing Board

In the Matter of)
Philadelphia Electric Company) Docket Nos. 50-352 OL
(Limerick Generating Station,) 50-353 6L
Units 1 and 2))

APPLICANT'S REPLY FINDINGS OF FACT AND CONCLUSIONS
OF LAW RELATING TO CONTENTIONS V-3a and V-3b

Philadelphia Electric Company, Applicant in the captioned proceeding, in accordance with 10 C.F.R. §2.754, hereby submits reply findings on Contentions V-3a and V-3b in response to "Findings and Conclusions from Records of Evidentiary Hearings on R.L. Anthony/FOE Contentions V-3a and V-3b," ("FOE's Proposed Findings") dated May 2, 1984. The reply findings are in the form of insertions to "Applicant's Proposed Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision," dated April 20, 1984 ("Applicant's Proposed Findings").

*/ After reviewing the NRC Staff's Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision, the Applicant has concluded that no reply is necessary. The Commonwealth of Pennsylvania's Proposed Findings of Fact are not addressed either inasmuch as the Board ordered the parties at hearing to start with the presumption of a breach. Tr. 5656-57.

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Many of FOE's Proposed Findings were anticipated in the Applicant's Proposed Findings and, as to those findings, no further reply is necessary. It is also noted that many of FOE's Proposed Findings are immaterial to the issues before this Board and many others are unsupported by the record. Thus, the Board should adopt the Applicant's Proposed Findings, as amended herein, and reject those of FOE as unsupported by the record evidence or as immaterial to its decision.

The following changes and additions should be made to the Applicant's Proposed Findings:

1. On page 5 of the Applicant's Proposed Findings, add Paragraph 8A following Paragraph 8:

8A. Contrary to FOE's assertion, the fact that Mr. Benkert "inherited" certain Limerick design drawings from his predecessor and did not specifically review the 57 drawings provided FOE during discovery does not render his testimony deficient. Mr. Benkert has considerable experience with nuclear power plants and with the Limerick Station in particular. Moreover, his testimony indicated that the calculations accompanying these drawings, which are the items important to this contention, were reviewed by Bechtel personnel under Mr. Benkert's supervision. Tr. 8395-97 (Benkert).

2. On page 6 of the Applicant's Proposed Findings, add Paragraphs 9A and 9B following paragraph 9:

9A. FOE's assertion that the testimony given by Dr. Campe, Dr. Kuo and Mr. Romney on behalf of the Staff is deficient because they have not viewed the Limerick Station is irrelevant. Dr. Campe was proffered to determine the amount of gasoline or natural gas vapor that would be available to detonate or deflagrate in the event of a postulated pipeline rupture. Inasmuch as the evaporation rate of gasoline or the amount of natural gas vapor that would be within explosive limits is dependent on factors other than those associated with the surrounding terrain, a view of the Station by Dr. Campe was not necessary. Even if information concerning the surrounding terrain were relevant, such features could be easily determined from maps detailing this area, which the witnesses had available to them. See, e.g., Applicant's Exh. 7.

9B. Dr. Kuo and Mr. Romney were proffered to testify as to the margins of structural capability of Category 1 structures to resist blast overpressures and the postulated mode of failure of the Station's cooling towers. A view of the Station is obviously not necessary to this determination. The relevant information concerning the ability of safety-related structures to withstand the effects of postulated overpressures and the margins of safety inherent in such designs can only be determined from drawings detailing the design of these facilities, to which the witnesses had access.

3. On page 7 of the Applicant's Proposed Findings, add Paragraph 11A following Paragraph 11:

11A. FOE's unsupported allegation that the ARCO and Columbia Gas pipelines were not considered during the Limerick construction license proceeding ("CP stage") is irrelevant. Preliminarily, there was simply no evidence adduced at hearing on this point. Moreover, even if the effects of a pipeline detonation or deflagration were not considered during the CP stage, this point is of no consequence. This issue was fully litigated during the instant hearing and it was shown that a worst-case explosion or deflagration would have no effect on the Station. It is solely upon this evidence that the Board must render its decision.

4. On page 9 of the Applicant's Proposed Findings, add the following sentences to Paragraph 17 before the sentence beginning "Even if this sensor failed . . .":

FOE's assertion that Mr. Christman's testimony proved that the automatic shut-off equipment could not be relied upon to shut down the line in the event of an ARCO pipeline rupture is totally without basis. The transcript pages cited by FOE, i.e., Tr. 5085, 5175, do not support this statement.

5. On page 15 of the Applicant's Proposed Finding, add Paragraph 28A following Paragraph 28:

28A. FOE's assertion that the flow of gasoline and gasoline vapor out of Possum Hollow Run would be blocked by

a roadway running parallel to the railroad embankment crossing that stream is misplaced. No evidence whatsoever was adduced at hearing concerning the effect such a roadway might have on the flow of gasoline and gasoline vapor out of Possum Hollow Run. The transcript references cited by FOE, i.e., Tr. 7525, 7531, 7553, certainly do not support this proposition. Moreover, the Staff's witnesses testified with respect to a hypothetical blockage occasioned in conjunction with the railroad embankment that given the volume of gasoline that would enter the stream during full pumpage rates (42,000 gallons per hour) and the limited width and steep banks of the ravine, the area available for evaporation would not be significantly increased by a postulated obstruction such as is referred to by FOE. Tr. 7527-45 (Campe).

6. On page 22 of the Applicant's Proposed Findings, add Paragraph 41A following Paragraph 41:

41A. FOE then contended that the Staff calculated that an overpressure of 24 psi would result on the Unit 2 reactor building from an assumed ARCO pipeline rupture. The record indicates that the overpressure figure in question was calculated in response to hypothetical questions posed by FOE utilizing a conversion factor of 10 instead of the proper factor of 2.4 provided in Reg. Guide 1.91. Additionally, this figure was determined using an evaporation area of 75,000 square feet, which is three times larger than the largest evaporation area the Staff's witnesses felt could

possibly result from the worst-case breach of the ARCO pipeline. Tr. 7506-07 (Campe); see Applicant's Proposed Finding 35. Furthermore, the Staff utilized the Applicant's very conservative evaporation rate which is approximately seven times the rate calculated by the Staff. Tr. 7504-A; see Applicant's Proposed Finding 39. There is simply no basis for combining every conservatism used by the Staff and Applicant and it would not contribute to a useful record to do so. Thus, the Board concludes that the postulation of an overpressure of 24 psi at the Station is not justified and that it need not be considered.

7. On page 31 of the Applicant's Proposed Findings, add Paragraph 60A following Paragraph 60:

60A. FOE's assertion that the momentum of the escaping gas would carry it to within 800 feet of the Station is unsupported by the evidence. Nothing in the evidence presented by FOE would compel such a result. While the escaping gas, if any, would possess momentum energy, the uncontroverted testimony indicated that, under idealized conditions, this energy would transport the gas, at most, approximately only 500 feet. Tr. 9017 (Walsh). The Applicant and Staff have used a series of extremely conservative assumptions relating to, e.g., the location of a postulated break, wind direction, dispersion, mixing, and detonability of the mixture, in postulating a scenario in which a natural gas vapor cloud could approach close enough to the Station that it could actually experience any significant blast

overpressures. The Board sees no reason to add more hypothetical assumptions to these and, indeed, the addition of further such assumptions would render the postulated scenarios more incredible than they already are.

8. On page 39 of the Applicant's Proposed Findings, add Paragraph 78A following Paragraph 78:

Construction Quality Assurance

78A. FOE also asserted that it should have been permitted to expand its inquiry to question the quality assurance program related to the construction of the Limerick structures and their "as-built" design. The Board rejected this argument at hearing, ruling that questions pertaining to quality assurance, such as whether structures have in fact been properly built in accordance with their design, is not within the scope of FOE's contentions. Tr. 7758. Moreover, FOE has failed to show any deficiencies in construction at the Station. Finally, the Applicant's witnesses stated that their analyses were based on drawings, although technically not considered "as-built" as that term is narrowly defined, which reflect current "as-built" conditions. Tr. 8239 (Vollmer). Thus, the Board properly limited FOE's inquiries to the degree of margin inherent in the Limerick designs.

9. On page 40 of the Applicant's Proposed Findings, add the following sentences to Paragraph 79 before the sentence beginning "Preliminarily, the Applicant . . .":

FOE's assertion that the Applicant and Staff did not calculate the overpressures resulting from a postulated ARCO pipeline explosion is simply incorrect. In each case, the effect of the rupture of the Columbia Gas pipeline was found to be bounding.

10. On page 44 of the Applicant's Proposed Findings, add Paragraph 85A following Paragraph 85:

85A. FOE asserted that the Applicant's margin calculations are incorrect because certain portions of the safety-related walls would experience pressures higher than those elements used to calculate the degree of margin. Inasmuch as the important inquiry with respect to the calculation of margins relates to the reaction of the critical element of each wall to the blast pressure rather than the highest pressure that any portion of the structure might experience, this assertion is without merit. For instance, in the example cited by FOE, while the corner of the structure might experience a higher blast overpressure than the critical element of that slab, the corner receives much greater support from the adjacent walls and is thus much stronger and can resist a greater overpressure than the critical element. Tr. 8947-51 (Palaniswamy, Vollmer). Therefore, the Applicant correctly limited its analysis to the critical element of each slab even though it might experience lower overpressure than other, sturdier, portions of the slab.

11. On page 49 of the Applicant's Proposed Findings, add Paragraph 93A following Paragraph 93:

93A. FOE also asserted that the Unit 1 reactor in operation filled with water would weigh 800-1,000 tons more than the Unit 2 reactor not yet in operation and that this weight differential would cause unaccounted for stresses that would adversely impact the foundations of the reactor building. The uncontroverted testimony indicated, however, that the containment structure supporting the reactor vessel, although located within the reactor building, is totally isolated from it by a seismic gap. Tr. 8401 (Vollmer). Therefore, the load presented by this weight would not be transmitted to the reactor building's foundations or walls and thus would not affect that structure. Tr. 8461 (Boyer, Vollmer, Benkert). With respect to FOE's assertion that the weight of the reactor would be transferred to the bedrock, the 800 additional tons constituting the loaded weight of the vessel is obviously so insignificant compared to the weight of the entire facility that it could not conceivably affect the stability of the bedrock. There is absolutely no probative evidence to the contrary.

12. On page 49 of the Applicant's Proposed Findings, add Paragraph 94A following Paragraph 94:

94A. FOE's allegation that the witnesses testifying to the transfer of forces from the suppression pool to the foundation, floor, walls, and roof of the reactor building were evasive is entirely unsupported by the record evidence.

A review of the transcript reveals that this subject was discussed at hearing solely in response to FOE's questions and that it was therefore presumably fully addressed to the extent FOE found it to be relevant. Tr. 8398-8402. Specifically, the evidence revealed that chugging, to which FOE specifically refers, is a phenomenon which could only occur following a loss of coolant accident ("LOCA"). The evidence further indicated that the pressure waves generated by chugging terminate at the walls of the suppression pool and are not transmitted to the reactor building inasmuch as the suppression pool is part of the containment and is therefore isolated from the reactor building by a seismic gap. Tr. 8400-02 (Vollmer, Ashley). Even if this were not so, there is no basis for postulating a simultaneous pipeline accident and LOCA such that this hypothetical load combination would have to be considered.

13. On page 60 of the Applicant's Proposed Findings, add Paragraphs 113A, 113B and 113C following Paragraph 113:

Relief Requested by FOE

113A. Although FOE filed no Proposed Findings supporting its prayer for relief, it requested that the Board order that the buildings containing the chlorine and sulfuric acid tanks, respectively, be converted to Seismic Class 1 construction. The only evidence adduced at hearing on this subject indicated that the chlorine could not possibly be released even if the building in which it is contained were damaged. The evidence indicated that if the sulfuric acid

were released, it would not reach the ground water. Even if it reached the ground water or the Schuylkill River, it would be so diluted that it could not possibly have a deleterious safety effect. Tr. 8916-17 (Boyer).

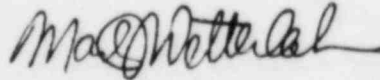
113B. FOE requested similar relief with respect to the nonsafety-related circulating water pumphouse containing two fire pumps. As to the fire pumps, the evidence indicated that although the ability of the circulating water pumphouse to resist an explosion had not been analyzed, it was designed to Seismic Class 2 and could therefore retain its operability following the occurrence of natural phenomena with severities having a recurrence of once in ten years, such as tornados, hurricanes, floods, ice storms, or small-intensity earthquakes. Tr. 8941-42 (Boyer). Moreover, the fire pumps are located in separate portions of the west end of that building and are separated by a three-hour fire barrier wall which would provide some protection. Tr. 8941-42 (Boyer). Most importantly, the evidence indicated that these pumps are backed by a number of other fire protection services and safety features incorporated into the design of the Station such that a fire occurring in any area of the plant could not affect the performance of a safety-related system or prevent safe shutdown of the Station. Tr. 8942-44 (Boyer).

113C. Also as part of its Conclusions of Law, FOE requested the Board to mitigate the alleged hazard from a railroad explosion by constructing an explosion-proof

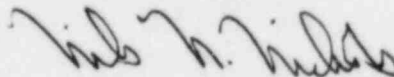
barrier between the railroad and the Station. The requested relief is improper inasmuch as questions related to the overpressures produced by the postulated railroad explosion and their effect on the Station are beyond the scope of FOE's contentions. The only matter for which evidence concerning the railroad explosion was admitted at hearing was to indicate to what overpressures the safety-related structures had previously been designed and evaluated. Tr. 8488-90. The use of this information in this manner in no way constituted reevaluation of what those pressures would be or their effect on the Station.

Respectfully submitted,

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May 18, 1984