

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Appeal Board



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

APPLICANT'S BRIEF IN OPPOSITION TO THE APPEALS OF
LIMERICK ECOLOGY ACTION, INC., AIR & WATER POLLUTION
PATROL, ROBERT L. ANTHONY AND FRIENDS OF THE EARTH
IN THE DELAWARE VALLEY RELATING TO THE
ATOMIC SAFETY AND LICENSING BOARD'S PARTIAL
INITIAL DECISION OF AUGUST 29, 1984

Troy B. Conner, Jr.
Mark J. Wetterhahn
Robert M. Rader
Conner & Wetterhahn, P.C.
Suite 1050
1747 Pennsylvania Avenue, N.W.
Washington, D.C. 20006

Counsel for the Applicant
Philadelphia Electric Company

Of Counsel:

Edward G. Bauer, Jr.
Eugene J. Bradley
Philadelphia Electric
Company
2301 Market Street
Philadelphia, PA 19101

December 28, 1984

8501020069 841228
PDR ADOCK 05000352
G PDR

DS03

TABLE OF CONTENTS

	<u>Page</u>
Preliminary Statement	1
Argument	2
I. LEA Appeal	2
A. The Board Did Not Err In Excluding Consideration Of Mitigative Alternatives	2
B. The Board Correctly Excluded The Contention Alleging That The Risk From Sabotage Must Be Discussed In The FES	19
C. The Board Properly Rejected LEA's Contentions Relating To Socio-Economic Impacts Of Compensation And Total Industrial Impacts	23
D. The FES And Record Of Decision Fully Disclose The Risk Of Human Health Impacts From Severe Accidents	25
E. The Record Of Decision Fully Complied With 10 C.F.R. §51.103	32
F. The Licensing Board Correctly Rejected LEA's Challenges To Applicant's Emergency Plan	34
1. The Evidence Established That Applicant's Emergency Facilities Will Meet All Regulatory Requirements	34
2. The Licensing Board Properly Found Applicant's Plans Adequate For Medical Care For Onsite Contaminated Injured Victims	39

II.	AWPP Appeal	48
A.	The Licensing Board's Challenged Evidentiary Findings Relating To Carburetor Icing Are Correct And Based Upon The Evidence Of Record	48
B.	The Board's Ruling With Regard To Welding Quality Assurance Contentions Are Correct	61
III.	FOE Appeal	69
A.	The Licensing Board's Challenged Evidentiary Findings Relating To The Effect Of Pipeline Ruptures On The Limerick Station Are Correct And Should Be Upheld	71
	Conclusion	83

TABLE OF CITATIONS

Cases

<u>Baltimore Gas and Electric Co. v. Natural Resources Defense Council, Inc.</u> , 462 U.S. 87 (1983)	27
<u>Carolina Environmental Study Group v. United States</u> , 510 F.2d 796 (D.C. Cir. 1975)	7
<u>Carstens v. NRC</u> , 742 F.2d 1546 (D.C. Cir. 1984)	15-16
<u>Citizens for Safe Power, Inc. v. NRC</u> , 524 F.2d 1291 (D.C. Cir. 1975)	14-15, 29
<u>Conservation Council of North Carolina v. Froehlke</u> , 435 F. Supp. 775 (M.D.N.C. 1977)	6
<u>Ecology Action v. AEC</u> , 492 F.2d 998 (2d Cir. 1974)	29
<u>Grazing Fields Farm v. Goldschmidt</u> , 626 F.2d 1068 (1st Cir. 1980)	31-32
<u>Kentucky ex rel. Beshear v. Alexander</u> , 655 F.2d 714 (6th Cir. 1981)	6
<u>Lake Erie Alliance for the Protection of the Coastal Corridor v. U.S. Army Corps of Engineers</u> , 526 F. Supp. 1063 (W.D. Pa. 1981), <u>aff'd without opinion</u> , 707 F.2d 1392 (3d Cir. 1983), <u>cert. denied</u> , ___ U.S. ___, 104 S. Ct. 277 (1983)	6

<u>Monarch Chemical Works v. Exon</u> , 466 F. Supp. 639 (D. Neb. 1979)	6-7
<u>Nader v. Nuclear Regulatory Commission</u> , 513 F.2d 1045 (D.C. Cir. 1975)	15
<u>National Indian Youth Council v. Watt</u> , 664 F.2d 220 (10th Cir. 1981)	6
<u>National Resources Defense Council v. Morton</u> , 458 F.2d 827 (D.C. Cir. 1972)	7
<u>North Anna Environmental Coalition v. Nuclear Regulatory Commission</u> , 533 F.2d 655 (D.C. Cir. 1976)	15, 72
<u>People Against Nuclear Energy v. Nuclear Regulatory Commission</u> , 678 F.2d 222 (D.C. Cir. 1982), <u>rev'd on other grounds</u> , <u>Metropolitan Edison C. v. People Against Nuclear Energy</u> , 460 U.S. 766 (1983)	22
<u>Power Reactor Development Co. v. Industrial Union</u> , 367 U.S. 396, 81 S. Ct. 1533, 6 L.Ed.2d 924 (1961)	15
<u>Power Reactor Development Co. v. International Union of Electrical, Radio & Machine Workers</u> , 367 U.S. 396 (1961)	15
<u>Sierra Club v. Morton</u> , 510 F.2d 813 (5th Cir. 1975)	18
<u>Sierra Club v. Sigler</u> , 695 F.2d 957 (5th Cir. 1983)	22-23
<u>Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark</u> , 720 F.2d 1475 (9th Cir. 1983), <u>cert. denied</u> , ___ U.S. ___, 83 L.Ed.2d 372 (1984)	22
<u>Trout Unlimited v. Morton</u> , 509 F.2d 1276 (9th Cir. 1974)	8
<u>Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.</u> , 435 U.S. 519 (1978)	6, 7

Nuclear Regulatory Commission Issuances

<u>Allied-General Nuclear Services</u> , ALAB-296, 2 NRC 671 (1975)	29
<u>Carolina Power & Light Company</u> (Shearon Harris Nuclear Power Plant, Units 1, 2, 3 and 4), CLI-80-12, 11 NRC 514 (1980)	35

<u>Commonwealth Edison Company (Dresden Nuclear Power Station, Unit No. 1), LBP-82-52, 16 NRC 183 (1982)</u>	17
<u>Commonwealth Edison Company (Zion Station, Units 1 and 2), ALAB-616, 12 NRC 419 (1980)</u>	61, 72
<u>Consolidated Edison Company of New York (Indian Point Station, Unit No. 3), CLI-75-14, 2 NRC 835 (1975)</u>	61
<u>Consolidated Edison Company of New York (Indian Point, Unit No. 2), LBP-83-68, 18 NRC 811 (1983)</u>	19-20
<u>Consumers Power Company (Midland Plant, Units 1 and 2), Docket Nos. 50-329 and 50-330, Memorandum and Order (Denying Motion to Require Caseload Forecast Panel to Evaluate Construction Completion Date) (May 25, 1984) (unpublished)</u>	35
<u>Duke Power Company (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397 (1976)</u>	51
<u>Duke Power Company (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 NRC 1041 (1983)</u>	66
<u>Florida Power & Light Company (Turkey Point Nuclear Generating Station, Nos. 3 and 4), ALAB-660, 14 NRC 987 (1981)</u>	31
<u>Long Island Lighting Company (Shoreham Nuclear Power Station), ALAB-156, 6 AEC 831 (1973)</u>	71
<u>Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), LBP-81-18, 14 NRC 71 (1981)</u>	17
<u>Maine Yankee Atomic Power Company (Maine Yankee Atomic Power Station), ALAB-161, 6 AEC 1003 (1973)</u>	16
<u>Maine Yankee Atomic Power Company (Maine Yankee Atomic Power Station), ALAB-175, 7 AEC 62 (1974)</u>	16
<u>Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), ALAB-698, 16 NRC 1290 (1982)</u>	34
<u>Niagara Mohawk Power Corporation (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347 (1975)</u>	29
<u>Offshore Power Systems (Manufacturing License for Floating Nuclear Power Plants), LBP-77-48, 6 NRC 249 (1977)</u>	17

<u>Pacific Gas and Electric Company</u> (Diablo Canyon Nuclear Power Plant, Units Nos. 1 and 2), ALAB-334, 3 NRC 809 (1976)	74
<u>Pacific Gas and Electric Company</u> (Diablo Canyon Nuclear Power, Units 1 and 2), CLI-84-12, 20 NRC 249 (1984)	46-47
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), ALAB-262, 1 NRC 163 (1975)	28
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), DD-79-16, 10 NRC 609 (1979)	65
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), LBP-82-43A, 15 NRC 1423 (1982)	3, 62
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), LBP-83-39, 18 NRC 67 (1983)	4, 63-64
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), LBP-84-31, 20 NRC 446 (1984)	1, 17, 27, 28, 29-31, 32-33, 36, 38, 40, 41, 42, 45, 46, 48-50, 52, 56, 68-71, 78, 80, 81
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), Memorandum and Order (October 29, 1984) (unpublished)	2
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), Order (Concerning Proposed FOE Contentions on Hazards from Industrial Activities) (November 22, 1982) (unpublished)	68
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), Order Confirming Rulings and Schedules Made at Special Prehearing Conference on NEPA Severe Accident Contentions (April 20, 1984) (unpublished)	4, 23
<u>Philadelphia Electric Company</u> (Limerick Generating Station, Units 1 and 2), Order (September 28, 1984) (unpublished)	1
<u>Portland General Electric Company</u> (Trojan Nuclear Plant), ALAB-531, 9 NRC 263 (1979)	18
<u>Public Service Co. of New Hampshire, et al.</u> (Seabrook Station, Units 1 and 2), CLI-78-1, 7 NRC 1 (1978)	29

<u>Public Service Co. of Oklahoma</u> (Black Fox Station, Units 1 and 2), ALAB-573, 10 NRC 775 (1979)	31
<u>Public Service Electric and Gas Company</u> (Hope Creek Generating Station, Units 1 and 2), ALAB-518, 9 NRC 14 (1979)	8, 9, 18, 28
<u>Public Service Electric & Gas Company</u> (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 NRC 43 (1981)	53
<u>Public Service of Indiana</u> (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-459, 7 NRC 179 (1978)	53
<u>Southern California Edison Company</u> (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-83-10, 17 NRC 528 (1983)	42, 43-44
<u>Tennessee Valley Authority</u> (Hartsville Nuclear Plant, Units 1A, 2A, 1B and 2B), ALAB-554, 10 NRC 15 (1979)	54
<u>Toledo Edison Company</u> (Davis-Besse Nuclear Power Station, Units 1, 2 and 3), ALAB-560, 10 NRC 265 (1979)	51
<u>Union Electric Company</u> (Calloway Plant, Unit 1), ALAB-740, 18 NRC 343 (1983)	65
<u>Vermont Yankee Nuclear Power Corporation</u> (Vermont Yankee Nuclear Power Station), ALAB-194, 7 AEC 431 (1974)	17
<u>Wisconsin Electric Power Company</u> (Point Beach Nuclear Plant, Unit 2), ALAB-78, 5 AEC 319 (1972)	54

Statutes

National Environmental Policy Act of 1969, 42 U.S.C. §4321, <u>et seq.</u>	3
---	---

Nuclear Regulatory Commission Regulations

10 C.F.R. §2.714	61
10 C.F.R. §2.718	66
10 C.F.R. §2.743(g)	38

10 C.F.R. §2.754(a)	66
10 C.F.R. §2.760a	33
10 C.F.R. §2.760(c)	38
10 C.F.R. Part 50, Appendix A, General Design Criterion 19	34
10 C.F.R. Part 50, Appendix E, Article IV.E.8	34
10 C.F.R. Part 50, Appendix E, Article E	49-40
10 C.F.R. §50.47(a)(1)	43
10 C.F.R. §50.47(a)(2)	43
10 C.F.R. §50.47(b)(12)	39
10 C.F.R. §50.57(a)	35
10 C.F.R. §51.41(b)(1)	27
10 C.F.R. §51.92(a)(2)	31
10 C.F.R. §51.93	30
10 C.F.R. §51.102	33
10 C.F.R. §51.102(c)	30, 32
10 C.F.R. §51.103	32
10 C.F.R. §51.104	38
10 C.F.R. §51.118	30
10 C.F.R. §52(b)(3)	29-30
40 C.F.R. §1502.22	19, 21
40 C.F.R. §1502.22(b)	22

Miscellaneous

Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG-0654 (November 1980)	39-40, 42-43
Functional Criteria for Emergency Response Facilities, NUREG-0696 (February 1981)	34, 36, 37

Requirements for Emergency Response Capability, Supp. 1, (Generic Letter No. 82-33), NUREG-0737 (December 17, 1982)	37
Methodology for Evaluation of Emergency Response Facilities, NUREG-0814 (Draft August 1981)	34-35, 36, 37
Final Environmental Statement Related to the Operation of Limerick Generating Station, Units 1 and 2, NUREG-0974 (April 1984)	5, 19, 24, 25
Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969, 45 Fed. Reg. 40101 (June 13, 1980)	3, 5, 23-24
Proposed Commission Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulation, 48 Fed. Reg. 16014 (April 13, 1983)	10-11
Safety Goal Development Program Policy Statement on Safety Goals for the Operation of Nuclear Power Plants, 48 Fed. Reg. 10772 (March 14, 1983)	11-13, 20-21
Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions and Related Conforming Amendments, 49 Fed. Reg. 9352 (March 12, 1984)	8, 21, 22
49 Fed. Reg. 24512 (June 14, 1984)	21

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



Before the Atomic Safety and Licensing Appeal Board

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

APPLICANT'S BRIEF IN OPPOSITION TO THE APPEALS
OF LIMERICK ECOLOGY ACTION, INC., AIR & WATER POLLUTION
PATROL, ROBERT L. ANTHONY AND FRIENDS OF THE EARTH
IN THE DELAWARE VALLEY RELATING TO THE
ATOMIC SAFETY AND LICENSING BOARD'S PARTIAL
INITIAL DECISION OF AUGUST 29, 1984

Preliminary Statement

On August 29, 1984, the Atomic Safety and Licensing Board ("Licensing Board" or "Board") issued its Second Partial Initial Decision ("PID"), Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), LBP-84-31, 20 NRC 446 (1984), in the captioned matter. On September 3, 1984, September 10, 1984 and October 23, 1984, intervenors Limerick Ecology Action ("LEA"), Air and Water Pollution Patrol ("AWPP"), and Robert L. Anthony and Friends of the Earth in the Delaware Valley, collectively "FOE",^{1/} respectively, appealed the Licensing

^{1/} By Order dated September 28, 1984, the Atomic Safety and Licensing Appeal Board dismissed FOE's notice of appeal, dated September 24, 1984, and extended the time for FOE to appeal the Licensing Board's decision until 15 days from the service date of the Licensing Board's order disposing of FOE motion pending before it.

Board's decision.^{2/} Applicant, Philadelphia Electric Company, hereby opposes the intervenors' appeals.^{3/}

Argument

I. LEA Appeal

LEA's appeal concerns the exclusion of certain of its proposed contentions from the proceeding relating to the risk from severe accidents at the Limerick Generating Station ("Limerick"), including mitigative design alternatives, sabotage, socioeconomic impacts of compensation of victims and total industrial impacts. It also contends that neither the FES nor the record of decision constitutes an adequate disclosure and consideration vehicle for NEPA purposes of the risk of human health impacts from severe accidents. With respect to emergency planning issues, LEA appeals certain findings of the Licensing Board regarding the adequacy of the Applicant's onsite emergency plan.

A. The Board Did Not Err In Excluding
Consideration of Mitigative
Alternatives.

LEA contends that the Licensing Board improperly excluded from the proceeding its contention that "preventative and/or mitigative alternatives to the design, mode of operation, procedures, and/or number of

^{2/} LEA filed its brief on October 4, 1984; AWPP filed its brief on October 10, 1984; and FOE filed its brief on November 23, 1984.

^{3/} By Memorandum and Order dated October 29, 1984, the Atomic Safety and Licensing Appeal Board clarified that Applicant and Staif would each file a single brief responding to all three appeals and that that brief was to be filed 30 days after service of FOE's brief. On December 14, 1984, the Appeal Board permitted Applicant to enlarge its brief to 90 pages.

reactors presently proposed [for Limerick] must be considered."^{4/} The basis for LEA's appeal is its assertion that the National Environmental Policy Act ("NEPA"), 42 U.S.C. §4321, et seq., and the Commission's regulations implementing that statute, require the Commission to consider alternatives to mitigate adverse environmental impact no matter how small or remote that impact may be.

The Licensing Board's consideration of probabilistic risk assessment ("PRA") techniques on the licensing of the Limerick Generating Station was extensive.^{5/} In its June 1, 1982 Special Prehearing Conference Order,^{6/} the Board admitted a general PRA contention subject to later specification:

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 levels, is inadequate and deficient.^{7/}

^{4/} Brief in Support of Appeal of Limerick Ecology Action, Inc. ("LEA Brief") at 4.

^{5/} This facility was one of the first to be governed by the provisions of the Statement of Interim Policy, Nuclear Power Plant Accident Considerations under the National Environmental Policy Act of 1969 which require an applicant's environmental report to discuss the risk of severe accidents. 45 Fed. Reg. 40101, 40103 (June 13, 1980).

^{6/} Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), LBP-82-43A, 15 NRC 1423 (1982).

^{7/} Id. at 1489.

The Board did not rule on the 32 specific contentions proposed at that time by LEA on this subject. The Board allowed informal discovery with regard to this matter, which was extensive, and then further considered the admissibility of specific contentions in two phases.^{8/}

In its Second Special Prehearing Conference Order, 18 NRC 67 (1983), the Licensing Board considered in detail the uses to which the PRA would be put in the licensing process.^{9/} It then ruled on LEA's resubmitted contentions, admitting two. These involved whether leakage past the main steam line isolation valves posed a problem for Limerick and the adequacy of plant design to withstand loss of offsite power events.^{10/} At that time, the Board reserved decision on the admissibility of probabilistic risk assessment contentions as they related to the Commission's responsibility under NEPA.^{11/}

In its Order Confirming Rulings and Schedules Made at Special Prehearing Conference on NEPA Severe Accident Contentions (April 20, 1984), slip op. at 3 (unpublished) the Board noted its oral ruling denying the contention which LEA now appeals. With regard to this contention, the Board had found that there had been several opportunities in the proceeding to allow particularization of contentions.^{12/}

^{8/} Id. at 1520-21.

^{9/} Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), LBP-83-39, 18 NRC 67, 70-83 (1983).

^{10/} Id. at 76, 78. LEA later decided not to pursue these two admitted contentions.

^{11/} Id. at 74.

^{12/} Tr. 9472.

The Board then discussed how the proffered contention was extremely general and defective in that LEA had not proffered a particular sequence for which it alleges that changes in the facility would be required.^{13/} The Board reiterated its inclination not to take an unnecessarily restrictive view of the applicability of regulatory provisions under the Atomic Energy Act or NEPA or any combination of the two, but found that LEA had not alleged anything specific.^{14/} The Board recognized that the NRC was looking at possible mitigations in a generic sense and was likely to continue that process in the future. The Board specifically noted that at that time it was not basing its denial of a contention on the fact that the Staff believed at that time that the present residual risk of the operation of the Limerick station is low.^{15/}

While it is beyond question that the environmental impact statement prepared by the NRC Staff^{16/} must include a reasoned consideration of the environmental risks attributable to postulated accidents at the Limerick facility,^{17/} it is likewise clear that the particular type of alternatives proposed by LEA need not be considered in the instant

^{13/} Id.

^{14/} Tr. 9472-73.

^{15/} Tr. 9473.

^{16/} Final Environmental Statement Related to the Operation of Limerick Generating Station, Units 1 and 2, NUREG-0974 (April 1984) ("FES").

^{17/} Nuclear Power Plant Accident Considerations under the National Environmental Policy Act of 1969, 45 Fed. Reg. 40101 (June 13, 1980).

proceeding. Both court precedents and Commission decisions clearly hold that alternatives which are remote and speculative need not be considered in fulfilling NEPA requirements.

The discussion of alternatives in an EIS was explained by the Supreme Court in Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519, 551 (1978), as follows:

To make an impact statement something more than an exercise in frivolous boilerplate the concept of alternatives must be bounded by some notion of feasibility.

Under this rationale, "NEPA does not contemplate detailed discussion of remote and speculative alternatives [T]he discussion of alternatives need not be 'exhaustive' but must contain sufficient information to permit a 'rule of reason' determination." National Indian Youth Council v. Watt, 664 F.2d 220, 226 (10th Cir. 1981). As the court stated in Kentucky ex rel. Beshear v. Alexander, 655 F.2d 714, 718 (6th Cir. 1981), "NEPA does not require a federal agency to discuss every conceivable alternative to a proposed action"

With regard to the particular assertion by LEA that certain measures should be taken to redesign the Limerick reactors, an important corollary of the rule that remote and speculative alternatives need not be considered states that "there is no need for an EIS to consider an alternative whose effect cannot reasonably be ascertained and whose implementation is deemed remote and speculative." Lake Erie Alliance for the Protection of the Coastal Corridor v. U.S. Army Corps of Engineers, 526 F. Supp. 1063, 1071-72 (W.D. Pa. 1981), aff'd without opinion, 707 F.2d 1392 (3d Cir. 1983), cert. denied, ___ U.S. ___, 104 S. Ct. 277 (1983). See also Monarch Chemical Works v. Exxon, 466 F. Supp.

639, 650 (D. Neb. 1979); Conservation Council of North Carolina v. Froehlke, 435 F. Supp. 775, 782 (M.D.N.C. 1977).

These principles were applied by the court in Carolina Environmental Study Group v. United States, 510 F.2d 796 (D.C. Cir. 1975), in rejecting propositions of the type posited here by LEA. The Court of Appeals for the District of Columbia held that the Atomic Energy Commission was not compelled to explore "every extreme possibility which might be conjectured" to reduce potential environmental harm. Instead, the Court found that the requirement for consideration of alternatives under NEPA is limited to "alternatives as they exist and are likely to exist." Id. at 801.

The Appeal Board rejected a similar contention in the Hope Creek proceeding, where the intervenors claimed that NEPA required the Staff to amend the FES to discuss alternative methods of protecting the facility from liquified natural gas accidents that might occur near the site. Finding that the probability that such an accident could affect the plant was highly remote, the Appeal Board dismissed the argument as unfounded, stating:

The Supreme Court has embraced the doctrine, first enunciated in Natural Resources Defense Council v. Morton, 458 F.2d 827, 837-38 (D.C. Cir. 1972), that environmental impact statements need not discuss the environmental effects of alternatives which are "deemed only remote and speculative possibilities." Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519, 551 (1978) and the same has been held with respect to remote and

speculative environmental impacts of the proposed project itself.^{18/}

The Appeal Board cited with approval Trout Unlimited v. Morton, 509 F.2d 1276 at 1283 (9th Cir. 1974) which held that "[a]n EIS need not discuss remote and highly speculative consequences. . . . A reasonably thorough discussion of the significant aspects of the probable environmental consequences is all that is required by an EIS."^{19/}

In the Statement of Consideration supporting its recent amendment to Part 51, the NRC defined the types of alternatives which must be considered in the environmental impact statements for facilities such as this one.^{20/} In addition to examining alternate energy sources and systems, alternative sites and transmission systems, an examination of alternative plant systems is required. The matters which must be examined under this category include "alternate heat dissipation systems, alternative circulating water systems, and alternative non-radioactive waste-treatment systems."^{21/} There is no indication whatsoever that the Commission intended to have its Staff and adjudicatory panels examine, on an ad hoc basis in adjudicatory proceedings, detailed alternatives to safety systems which meet all safety regulations and standards. This course is fully consistent with the Appeal

^{18/} Public Service Electric and Gas Company (Hope Creek Generating Station, Units 1 and 2), ALAB-518, 9 NRC 14, 38 (1979).

^{19/} Id. at 38-39.

^{20/} Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions and Related Conforming Amendments, 49 Fed. Reg. 9352 (March 12, 1984).

^{21/} Id. at 9354-55.

Board's decision in Hope Creek which concluded that there was "no logical reason why NEPA should require so much more than do the safety provisions of the Atomic Energy Act and this Commission's safety regulations."^{22/}

As proof that the alternatives it suggests for implementation at Limerick are neither "remote" nor "speculative," in its Brief at 5, LEA relies on a statement in the Commission's "Proposed Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulation" which provides that:

In future CP applications for both pressurized water reactors (PWRs) and boiling water reactors (BWRs), filtered vented containment systems or a variation of such systems, should be provided if these yield a cost-effective reduction in risk.

. . .

The Staff is studying the need for more reliable subsystems for containment heat removal... as possible alternatives to filtered venting for prevention of gradual overpressurization failure of the containment building. The cost-effectiveness of this alternative should be considered in the design of plants for new CP application.^{23/}

On its face, this passage clearly indicates that filtered vented containment systems, the alternative that LEA emphasizes, should only be considered in future applications for construction permits. It in no way applies to current applications for an operating license; in fact,

^{22/} Hope Creek, supra, ALAB-518, 9 NRC 14, 39 (1979).

^{23/} Proposed Commission Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulation. 48 Fed. Reg. 16014, 16019-020 (April 13, 1983) (emphasis added).

as discussed below, the Commission has specifically rejected any such interpretation.

The Commission specifically considered in the Proposed Policy Statement on Severe Accidents what treatment should be accorded severe accidents in ongoing licensing proceedings in terms of alternatives such as those proposed by LEA. Noting the proposed nature of the policy statement, it stated that:

The Commission has considered the question of whether additional regulations should be issued at this time to require more capability to mitigate the consequences of severe accidents in operating plants and plants under construction. Although, as noted above there are large programs presently ongoing that will provide information related to this question, they have not yet produced significant new insights into consequence mitigation features sufficient to support further regulatory changes, nor have they yet shown a clear need to add such features.

. . .
Accordingly, individual licensing proceedings are not appropriate forums for a broad examination of the Commission's regulatory requirements relating to control and mitigation of accidents more severe than the design basis. Similarly, notwithstanding the Class 9 accidents review requirements for environmental hearings of the Commission's Statement of Interim Policy on "Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969" (45 FR 40101, June 13, 1980), the capability of current designs or procedures (for alternatives thereto) to control or mitigate severe accidents should not be addressed in case-related safety hearings.^{24/}

In the Policy Statement, the Commission reaffirmed its confidence in its existing safety regulations:

^{24/} Id. at 16018.

Rather, the NRC will continue to use conformance to regulatory requirements as the exclusive licensing basis for plants. Use of the policy statement during the evaluation period will be limited to uses such as examining proposed and existing regulatory requirements, establishing research priorities . . . and defining the relative importance of issues as they arise. At the conclusion of the evaluation period, the Commission will consider if any revisions are necessary before the issuance of a final policy statement and a plan for its implementation.^{25/}

The reasons for maintaining conformance to current regulatory requirements as the exclusive licensing basis for nuclear power plants are set forth in the Commission's separate statement of its Safety Goal Development Program.^{26/} Therein, the Commission, discussing the role of probabilistic risk assessments in deciding whether potentially mitigative features should be required, stated that:

Since the completion of the Reactor Safety Study, further progress in developing probabilistic risk assessment and in accumulating relevant data has led to recognition that it is feasible to begin to use quantitative reactor safety design objectives for limited purposes. However, because of the sizable uncertainties still present in the methods and the gaps in the data base - essential elements needed to gauge whether the objectives have been achieved - the design objectives should be viewed as aiming points or numerical benchmarks which are subject to revision. In particular, because of the present limitations in the state of the art of quantitatively estimating risks, the design objectives are not substitutes for existing regulations.^{27/}

^{25/} Id. at 16015.

^{26/} Safety Goal Development Program Policy Statement on Safety Goals for the Operation of Nuclear Power Plants, 48 Fed. Reg. 10772 (March 14, 1983).

^{27/} Id. at 10774.

The Commission indicated that current regulatory practices are sufficient "to ensure that the basic statutory requirement, adequate protection of the public, is met."^{28/} It explained its reasons for setting new preliminary safety goals and numerical design objectives as follows:

Nevertheless, current practices could be improved to provide a better means for testing the adequacy of and need for current and proposed regulatory requirements. The Commission believes that such improvement could lead to a more coherent and consistent regulation of nuclear power plants, a more predictable regulatory process, a public understanding of the regulatory criteria that the NRC applies, and public confidence in the safety of operating plants. ^{29/}

The Commission has recognized that risk assessment techniques are still in their infancy. Information developed as a result of utilizing PRA techniques, when couched in the proper terms and with the necessary qualifications on its use, may serve to disclose risks. By their very nature, however, such assessments are not sufficiently reliable to serve as a basis for decisionmaking with regard to alternative safety considerations. The Commission explicitly recognized this in its Safety Goal Policy Statement when it stated that at least two years of evaluation were necessary before the Commission could even consider utilizing the probabilistic risk approach in its licensing process.^{30/} The "sizable uncertainties still present in the methods" and "gaps in the data

^{28/} Id. at 10773.

^{29/} Id.

^{30/} Id. at 10775.

base,"^{31/} which introduce uncertainties into predictions made utilizing probabilistic risk assessment techniques, make it impossible to determine that any alternative is necessary or that a selected alternative is preferable. The Commission found "a serious question whether, for a specific nuclear power plant, the achievement of a regulatory-imposed quantitative risk goal can be verified with a . . . sufficient degree of confidence."^{32/} Therefore, mitigative actions such as those proposed by LEA are entirely speculative and their consideration is not required.

The risk posed by operation of Limerick is already extremely small. However, no matter how small the residual risk of an accident, there will always be further theoretical measures which might be taken to further reduce its probability or consequences. Even if that additional step were taken, there would always be yet some further incremental risk remaining and yet another step which could be taken to reduce that risk, however small. If LEA is arguing that alternatives need be implemented if it is cost beneficial, this is contrary to NRC policy. The determination of what the design objectives should be and what is cost beneficial is an integral part of the Safety Goal Development Program.^{33/}

There is no precedent involving NRC licensing that LEA points to which requires that these small risks be further explored or where mitigation measures were required. To the contrary, courts have held

^{31/} Id. at 10774.

^{32/} Id. at 10775.

^{33/} Id. at 10774-75.

that weighing the residual risks against the benefits of the action is sufficient to fulfill the Atomic Energy Act and NEPA requirements. In Citizens for Safe Power, Inc. v. NRC, 524 F.2d 1291 (D.C. Cir. 1975) the court discussed the interrelationship of the Atomic Energy Act and the National Environmental Policy Act. It found that Atomic Energy Act requirements cannot be viewed separate and apart from NEPA considerations:

Especially in view of NEPA, it also is unreasonable to suppose that risks are automatically acceptable, and may be imposed upon the public by virtue of AEA, merely because operation of a facility will conform to the Commission's basic health and safety standards. The weighing of risks against benefits in view of the circumstances of particular projects is required by NEPA in view of AEA. The two statutes and the regulations promulgated under each must be viewed in pari materia.^{34/}

The court recognized the special significance of the Atomic Energy Act and compliance with health and safety regulations:

Under these circumstances, compliance with the mass of health and safety regulations with which the reactor conforms has a significance of its own. As the Supreme Court noted, the Atomic Energy Act "clearly contemplates that the Commission shall by regulation set forth what the public safety requires as a prerequisite to the issuance of any license or permit under the Act." Power Reactor Development Co. v. Industrial Union, 367 U.S. 396, 404, 81 S.Ct. 1533, 6 L.Ed. 2d 924 (1961).

The court cited with approval the Atomic Safety and Licensing Appeal Board's analysis of the requirements under both the Act and NEPA regarding residual risks. As the court stated, "the Appeal Board,

^{34/} Id. at 1299.

citing NEPA regulations, recognized that in 'a weighing of the residual risks against the benefits' of the reactor is appropriate under NEPA" and that factoring the residual risks into the environmental analysis and concluding that they would not tip the balance against the operation of the plant was sufficient to assure compliance with NEPA.^{35/}

Recently, the Court of Appeals for the District of Columbia rejected an argument similar to the one advanced here by LEA, stating that the Commission's statutory mandate is to provide adequate protection to health and safety of the public and does not require a risk free environment:

In addition, the courts have long accepted the Commission's definition of its statutory mandate to "provide adequate protection to the health and safety of the public" as requiring not a risk-free environment, but a "reasonable assurance . . . that the reactor could be safely operated at the proposed location." Power Reactor Development Co. v. International Union of Electrical, Radio & Machine Workers, 367 U.S. 396, 414 (1961). See also North Anna Environmental Coalition v. Nuclear Regulatory Commission, 533 F.2d 655, 665-67 (D.C. Cir. 1976) [Nuclear Regulation Reports, §20,023]; Nader v. Nuclear Regulatory Commission, 513 F.2d 1045, 1052 (D.C. Cir. 1975). These cases are fundamentally at odds with petitioners' argument that uncertainty, coupled with the mandate of "conservatism," requires the NRC to adopt wholesale

^{35/} Id. at 1299-1300. The court also rejected a claim that the NRC was required to deal with the risks explicitly by way of identification, assessment of significance and explanation of why it was issuing the license in the face of such risks. The court found that the disclosure of the actual balance and weighing of risk and benefits principally in findings directed to the environmental issues "did reasonably well in satisfaction of procedural as well as substantive requirements of both Acts." Id. at 1301.

the worst case scenario that a party may gloomily frame.^{36/}

In Maine Yankee Atomic Power Company (Maine Yankee Atomic Power Plant), ALAB-175, 7 AEC 62, 64 (1974), the Appeal Board found that the possibility of the existence of remote risks does not preclude the issuance of an operating license:

In short, we did not look upon the radiological stipulation as bringing to light any significant residual risks beyond those already addressed in the FES. As we stressed, what the stipulation did was to make explicit what may well have been implicit in the FES itself: "that the present state of our knowledge precludes an absolute finding that no somatic or genetic effects will flow from the operation of the reactor" ([Maine Yankee Atomic Power Company (Maine Yankee Atomic Power Station), ALAB-161, 6 AEC 1003, 1013 (1973)]; emphasis supplied). The Licensing Board having clearly factored at least the FES revelations and conclusions into its cost-benefit balance, we thus saw the question as coming down to this: might the denial of an operating license to the Maine Yankee facility be warranted by the fact that, even though remote, the possibility of meaningful environmental impact from radiation exposure cannot be entirely dismissed? (footnotes omitted)

As the Licensing Board properly ruled, the contention proffered by LEA was inadmissible because, as proposed, it is lacking in specificity. The references to generic studies cited by LEA do not provide specificity as to the particular sequences and systems which should be added at Limerick because the environmental costs of low probability accidents exceed the calculated benefits. LEA has never argued that the risks of low probability accidents are sufficiently significant to affect the

^{36/} Carstens v. NRC, 742 F.2d 1546, 1557 (D.C. Cir. 1984).

cost benefit balance for the facility. Before the Board, it had contended only that "mitigative alternatives" should be considered. Under the Commission's regulations and decisions, contentions lacking specificity are clearly inadmissible. See, e.g., Commonwealth Edison Company (Dresden Nuclear Power Station, Unit No. 1), LBP-82-52, 16 NRC 183, 192-93 (1982); Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), LBP-81-18, 14 NRC 71, 75 (1981); Offshore Power Systems (Manufacturing License for Floating Nuclear Power Plants), LBP-77-48, 6 NRC 249, 250-251 (1977). Had LEA obtained information which would have added basis and specificity to its contention, it should have brought it before the Board.

Even had LEA been correct that a contention should have been admitted that alternatives to safety systems should have been examined, based upon the circumstances that existed at the pleading stage, no remand is necessary. The Licensing Board has found the risk of environmental effects, including health effects, resulting from low probability, high consequence accidents to be "clearly small" compared to the risks to which the environment and the population are otherwise exposed.^{37/} LEA has not appealed this finding by the Board. LEA does not allege noncompliance with any of the Commission's safety regulations which the Commission has found to be adequate to protect the health and safety of the public.^{38/} In these circumstances there would be no point

^{37/} LBP-84-31, supra, 20 NRC at 573.

^{38/} See, e.g., Vermont Yankee Nuclear Power Corporation (Vermont Yankee Nuclear Power Station), ALAB-194, 7 AEC 431, 443-44 (1974).

in further consideration of alternative mitigation systems. Alternatives which result in similar or greater harm need not be considered.^{39/} The Appeal Board has endorsed this position in the Trojan proceeding:

As we read it, the NEPA mandate that alternatives to the proposed licensing action be explored and evaluated does not come into play in such circumstances - in short, there is no obligation to search out possible alternatives to a course which itself will not either harm the environment or bring into serious question the manner in which this country's resources are being expended.^{40/}

The Appeal Board followed a similar course in Hope Creek where it found that the record below had established that the "event is so unlikely that its environmental impact need not be considered."^{41/}

The Board's rejection of this contention was correct and should be upheld.

^{39/} Sierra Club v. Morton, 510 F.2d 813, 825 (5th Cir. 1975).

^{40/} Portland General Electric Company (Trojan Nuclear Plant), ALAB-531, 9 NRC 263, 266 (1979).

^{41/} Hope Creek, supra, ALAB-518, 9 NRC 14, 39 (1979) (citations omitted).

B. The Board Correctly Excluded The
Contention Alleging That The Risk
From Sabotage Must Be Discussed
In The FES.

LEA asserts that the Board improperly excluded consideration of the risk from sabotage from the FES. Specifically, it contends that "scientific uncertainties alone concerning the magnitude of risk [of sabotage] cannot justify the total exclusion of the risk from NEPA review."^{42/} In support of this argument, it relies primarily upon 40 C.F.R. §1502.22 of the Council on Environmental Quality ("CEQ") regulations which it asserts mandates the preparation of a "worst case" analysis in such cases.^{43/}

LEA's statement of basis in support of its proposed contention, an assertion by Steven Sholly of the Union of Concerned Scientists that a sabotage risk analysis could be performed, does not support the admission of this contention. As presented to the Board, LEA made no showing to the Board that Mr. Sholly had any expertise in the field of probabilistic risk assessment.^{44/} Moreover, the submitted excerpt from the

^{42/} LEA Brief at 15.

^{43/} Id. at 16. Section 1502.22 of the CEQ regulations provides in pertinent part that "[i]f the information relevant to adverse impacts is essential to a reasoned choice among alternatives and is not known and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement." Here, information on the potential effects of sabotage was not included in the Applicant's or Staff's analysis because, as noted in the FES, such an analysis is "beyond the state of the art of probabilistic risk assessment." FES at 5-74.

^{44/} LEA states on appeal for the first time that Mr. Sholly had previously testified on probabilistic risk assessment in the context of reactor sabotage and incident consequence analysis in
(Footnote Continued)

document prepared by Mr. Sholly in support of LEA's proposed contention admits that "[s]uch a study would obviously have large uncertainties."^{45/} The report is largely generic in nature with no specificity concerning the feasibility or results of any specific study of sabotage or sabotage-related risk regarding the Limerick Station. Mr. Sholly sets forth no reasons why the Limerick Station would be more vulnerable to sabotage than other nuclear facilities. Clearly, the prediction of the outcome of such a study is at best highly speculative and there is no showing whatsoever that sabotage adds substantially to the risk of operation of Limerick.

This conclusion is supported by the Commission's explicit finding that sabotage cannot be reasonably considered in probabilistic risk terms. The Commission did not include the possible effects of sabotage or diversion of nuclear material in its Safety Goal Development Program because it found that:

[A]t present there is no basis on which to provide a measure of risk on these matters. It is the Commission's intention that everything that is needed shall be done to keep such risks at their present, very low, level; and it is our

(Footnote Continued)

Consolidated Edison Company of New York (Indian Point, Unit No. 2), LBP-83-68, 18 NRC 811, 889-90 (1983). Furthermore, LEA attempts to bolster its position by raising matters not raised before the Licensing Board in ruling on the Board's exclusion of a contention. This is impermissible. For example, LEA attempts to cite Mr. Sholly's testimony and licensing board findings from the Indian Point proceeding (LEA Brief at 13).

^{45/} LEA Brief at 12.

expectation that efforts on this point will continue to be successful.^{46/}

LEA brings forward nothing which would cast doubt on this finding. Applicant submits that the Commission's finding regarding the low level of risk and the present lack of bases to provide a measure of inability to quantify the risk of sabotage is binding upon the Appeal Board.^{47/}

It is therefore clear that the risk of sabotage could not be included in the FES pursuant to 40 C.F.R. §1502.22 because there is no realistic way of "knowing" such information. Even if this were not so, 40 C.F.R. §1502.22 is not applicable to environmental reviews conducted by the Staff in any event. On March 12, 1984, the NRC published a final rule revising Part 51 of its regulations relating to environmental protection requirements for domestic licensing.^{48/} In the Statement of Consideration supporting this rule, the Commission stated that:

As a matter of law, the NRC as an independent regulatory agency can be bound by CEQ's NEPA regulations only insofar as those regulations are procedural or ministerial in nature. NRC is not bound by those portions of CEQ's NEPA regulations which have a substantive impact on the way in which the Commission performs its regulatory functions.^{49/}

^{46/} 48 Fed. Reg. at 10773 (emphasis supplied).

^{47/} There is simply no basis for LEA's statement that probabilistic risk assessments have not been done for sabotage because of "reluctance to confront the issue." LEA Brief at 14.

^{48/} 49 Fed. Reg. 9352 (March 12, 1984). The rule became effective on June 7, 1984. 49 Fed. Reg. 24512 (June 14, 1984).

^{49/} Id.

The Commission then specifically considered the applicability to its procedures of 40 C.F.R. §1502.22(b), the worst-case analysis provision cited by LEA. It found that by "specifying what information the agency must consider . . . , §1502.22(b) becomes, in essence, a substantive requirement rather than a procedural requirement" and thus is not binding on the NRC.^{50/} It further stated that its Statement of Interim Policy on Nuclear Power Plant Accident Considerations Under NEPA set forth its guidance "on the treatment to be accorded nuclear power plant accidents in environmental impact statements prepared pursuant to Section 102(2)(C) of NEPA."^{51/} Clearly then, the "worst case" analysis suggested by LEA has been disclaimed by the NRC and was not required in the instant case.^{52/} In any event, LEA never raised this matter below.

^{50/} 49 Fed. Reg. 9356.

^{51/} Id.

^{52/} LEA "disagrees with the Commission's view of the extent to which CEQ regulations are binding on [it]," but provides no substantive authority to support its position. LEA Brief at 16. People Against Nuclear Energy v. Nuclear Regulatory Commission, 678 F.2d 222, 237 (D.C. Cir. 1982), rev'd on other grounds, Metropolitan Edison Co. v. People Against Nuclear Energy, 460 U.S. 766 (1983) certainly does not support this proposition. At most, it recognizes that the procedural requirements set forth in the CEQ regulations are binding on the NRC. It makes no statement whatsoever concerning the applicability to the NRC of their substantive requirements.

Similarly, LEA's assertion (LEA Brief at 16 n.13) that it need not rely on CEQ regulations alone for its argument that a worst-case sabotage analysis must be prepared "because NEPA itself imposes the obligation to prepare a worst case analysis where uncertainties exist," has no validity. The cases cited by LEA in support of this proposition, Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark, 720 F.2d 1475 (9th Cir. 1983), cert. denied, U.S., 83 L.Ed.2d 372 (1984) and Sierra Club v. Sigler, 695 F.2d 957 (5th

(Footnote Continued)

For the foregoing reasons the Board was correct in denying this contention.

C. The Board Properly Rejected LEA's Contentions
Relating To Socio-Economic Impacts Of
Compensation and Total Industrial Impacts.

LEA contends that the FES improperly failed to disclose or consider (1) the socio-economic cost of compensation required for health effects induced by radiation exposure and (2) industrial impacts beyond the first year following the accident, and quantification of costs beyond the "output loss" mentioned in the DES. ^{53/} The Board rejected these subsections of LEA Contention 4 because that the impacts were "speculative, both in terms of occurrence and in terms of any reasonable quantification, even given that occurrence, and they are remote in terms of our reasonable proximity." ^{54/}

The Board's decision with respect to these subcontentions was correct. The Commission's Statement of Interim Policy Regarding Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969 states only that "[s]ocioeconomic impacts that might be associated with emergency measures during or following an accident

(Footnote Continued)

Cir. 1983) rely upon principles which were determined by courts deferring to CEQ's interpretation of NEPA. See Sigler, 695 F.2d at 972. Thus, the principles referred to by LEA require no more deference than the CEQ regulations which subsequently codified them.

^{53/} LEA Brief at 19.

^{54/} See also Tr. 8773-74. Order Confirming Rulings and Schedules Made at Special Prehearing Conference on NEPA Severe Accident Contentions (April 20, 1984) (as published at 2).

should . . . be discussed."^{55/} Consistent with this policy, the Staff considered the impacts that could reasonably be expected to occur during the first year following an accident.^{56/} It was not necessary to consider longer term consequences because it was determined that they would vary widely depending on the level and nature of efforts to mitigate the accident consequences and to decontaminate the physically affected areas.^{57/} In short, such effects are highly speculative at best. LEA has not shown otherwise.

Other economic impacts and risks were also discussed including the expected employment loss and the output loss risk.^{58/} Ultimately, the Staff derived an overall economic risk from the operation of Limerick for the first year of operation and every subsequent year of operation,^{59/} thus fully complying with its responsibilities under NEPA and the Commission's Statement of Interim Policy.

LEA asserts that "the Staff, with approval of the ASLB, chose to ignore additional significant economic impacts that can be known with reasonable certainty to occur in the aftermath of a severe accident at a nuclear power reactor facility."^{60/} However, LEA provides no basis for

^{55/} 45 Fed. Reg. at 40103.

^{56/} FES at 5-106.

^{57/} Id.

^{58/} Id. at 5-106-107.

^{59/} Id. at 5-107.

^{60/} LEA Brief at 20.

its assertion that these impacts would be significant in terms of impact on the cost benefit balance of the facility.

The point with regard to disclosure of compensation by virtue of the Price Anderson Act is somewhat unclear. The insurance coverage is an offset against economic losses and medical costs described in the FES and at the evidentiary proceeding. In any event, should the Appeal Board find that this cost should be disclosed, the Appeal Board may readily calculate the maximum economic annual risk as the present Price Anderson limit, currently \$610,000,000, multiplied by the probability of an incident as calculated by the Staff $(10^{-4})^{61/}$ to get an annual value of \$61,000, a small amount.^{62/} It would be impossible to speculate as to additional Congressional appropriations following an accident. The Board's treatment of this matter was correct.

D. The FES And Record Of Decision Fully
Disclose The Risk of Human Health
Impacts From Severe Accidents.

LEA contends that the FES failed to adequately disclose, for NEPA purposes, the risk of certain human health impacts from severe accidents. Specifically, LEA contends that the risk of genetic effects, cancers without a fatal outcome, benign thyroid nodules and hypothyroidism, radiation-induced spontaneous abortions, sterility, and development impairment of children, were not explicitly displayed in the

^{61/} FES at 5-107.

^{62/} This assumes that the maximum Price Anderson payment is associated with a severe core damage accident (see FES-5-107). The value of the issuance would climb slightly as the remaining reactors under construction receive operating licenses and the limit on the pool is increased.

FES. LEA also argues that the Licensing Board improperly concluded that the FES was amended by the record of decision on these issues.^{63/}

Preliminarily, it is important to note that LEA does not contend that the information disclosed at the hearing or in the Partial Initial Decision regarding these points was incorrect. Instead, it merely asserts that the failure to explicitly disclose this material in the FES was error. LEA also concomitantly asserts that publication of this information in the decision is insufficient to comply with NEPA. Thus, the issue at hand is whether the information in question was required to have been explicitly disclosed in the FES, as originally published and, if so required, whether its publication in the record of decision was sufficient to cure any omission. A related question is whether, if the publication of such material in the record of decision is sufficient, must that decision then be circulated for comment.

Turning to the first question, with respect to its claim that certain effects should have been listed or displayed in the FES, LEA relies upon a passage in the Commission's Statement of Interim Policy on Nuclear Power Plant Accident Considerations under the National Environmental Policy Act which provides that "Environmental Impact Statements shall include a reasoned consideration of the environmental risks (impacts) attributable to accidents at the particular facility."^{64/} It

^{63/} LEA Brief at 26-31.

^{64/} Id. at 26.

also relies on Baltimore Gas and Electric Co. v. Natural Resources Defense Council, Inc., 462 U.S. 87 (1983). ^{65/}

As the Licensing Board noted in its decision regarding this claim, "the key word is 'significant.'" ^{66/} The evaluation of severe accidents is by its very nature complex and, because of its reliance on computer analysis with a virtually unlimited number of possible input and output variations, could easily become totally unmanageable. In recognition of this fact, the Commission has indicated in its regulations concerning environmental reports that "[i]mpacts shall be discussed in proportion to their significance." ^{67/} In the instant case, the Staff discussed those topics which its experience indicated were most important and would best illustrate the risk from Limerick. ^{68/} The Board then struck a further balance by discussing various additional areas suggested by the intervenors, including LEA, in their contentions. That, of course, does not indicate that the matters which the Staff had originally chosen to evaluate were incorrect or inadequate. To the contrary, considering the stage of development of severe accident review techniques, the Staff's approach was reasonable and, as indicated by the evidence, is supported by a consensus of experts in the field. ^{69/}

^{65/} Id. at 26-27.

^{66/} LBP-84-31, supra, 20 NRC at 573.

^{67/} 10 C.F.R. §51.41(b)(1).

^{68/} See, e.g., Tr. 11272-76, 11329-32.

^{69/} See, e.g., Tr. 11329-37.

Further, as the Board noted with respect to the effects LEA asserts should have been considered:

Where such estimates are clearly small, as they are here, compared to the risks to which the environment and the population are otherwise exposed, second order effects cannot reasonably be considered significant. Further, whatever significance such second order risks may have, they may reasonably be considered as enveloped by the uncertainty in the estimates of the dominant risks.^{70/}

LEA has totally failed to show, despite its protestations, that any of the effects cited by it are truly significant compared to those discussed in the FES. Accordingly, the Board correctly found that the effects proposed by LEA for explicit consideration in the FES need not be considered.^{71/}

Even if LEA's claim that the effects it litigated were significant and should have been explicitly considered in the FES were correct, LEA's further claim that the FES could not be amended by issuance of the record of decision on those issues, is without merit. As noted by the Board:

Even though an FES may be inadequate in certain respects, ultimate NEPA judgments with respect to any facility are to be made on the basis of the entire record before the adjudicatory tribunal. Philadelphia Electric Co. (Limerick Generating Station, Units 1 & 2), ALAB-262, 1 NRC 163, 197 n.54 (1975) (emphasis added). See also Public Service Electric and Gas Company (Hope Creek Generating Station, Units 1 and 2) ALAB-518, 9 NRC 14, 39 (1979). Since findings of the licensing tribunal are deemed to amend the FES, amendment and recirculation of the FES

^{70/} LBP-84-31, supra, 20 NRC at 573.

^{71/} Id.

is not ipso facto necessary where findings of a licensing board differ from those of the FES, particularly where the hearing will provide the public ventilation that recirculation of an amended FES would otherwise provide. Philadelphia Electric Co., ALAB-262, supra, at 197 n.54. Thus, modification of the FES by Staff testimony or the licensing board's decision does not normally require recirculation of the FES, Niagara Mohawk Corp. (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 371-72 (1975), unless the modifications are truly substantial. Allied-General Nuclear Services, ALAB-296, 2 NRC 671, 680 (1975). As we find below, the basic conclusions of the FES are unchanged by our findings. The modifications to the FES made by the record and decision in this case create no reason to recirculate the FES for further comments.^{72/}

LEA argues to the contrary, contending that the precedents underlying this holding rest upon a regulation, 10 C.F.R. §52(b)(3) "which no longer exists and . . . is inapplicable to this proceeding."^{73/} LEA correctly states that 10 C.F.R. §52(b)(3), which provided that, to the extent a board made findings and reached conclusions different from those of the FES, the FES was deemed modified and the initial decision would be circulated for review, was not reenacted during the

^{72/} LBP-84-31, supra, 20 NRC at 552-53 (emphasis in original). In this respect, the Licensing Board also noted that:

Two Courts of Appeals have approved the Commission's rule that the FES is deemed modified by subsequent NRC (AEC) administrative adjudications. Citizens for Safe Power, Inc. v. NRC, 524 F.2d 1291, 1294, n.5 (D.C. Cir. 1975); Ecology Action v. AEC, 492 F.2d 998, 1001-02 (2nd Cir. 1974). See also Public Service Co. of New Hampshire, et al. (Seabrook Station, Units 1 & 2), CLI-78-1, 7 NRC 1, 29 n.43 (1978).

Id. at 553.

^{73/} LEA Brief at 31.

recodification of Part 51.^{74/} However, the new Part 51 contains the equivalent requirements. 10 C.F.R. §51.102(c) specifically provides that:

(c) When a hearing is held on the proposed action under the regulations in Subpart G of Part 2 of this chapter . . . the initial decision of the presiding officer or the final decision of the Atomic Safety and Licensing Appeal Board or the final decision of the Commissioners acting as a collegial body will constitute the record of decision. An initial or final decision constituting the record of decision will be distributed as provided in §51.93.

Section 51.93 provides:

(a) A copy of the final environmental impact statement will be distributed to:

- (1) The Environmental Protection Agency.
 - (2) The applicant or petitioner for rule-making and any other party to the proceeding.
- . . .

(d) A supplement to a final environmental impact statement will be distributed in the same manner as the final environmental impact statement to which it relates.

(e) News releases stating the availability and place for obtaining or inspecting a final environmental impact statement or supplement will be provided to local newspapers and other appropriate media.

(f) A notice of availability will be published in the Federal Register in accordance with §51.118.

Thus, the Commission regulations recognize that a licensing board's decision constitutes part of the environmental impact process and is entitled to the same treatment as the original Staff FES. In this case, the Board specifically found that the FES, as amended by the record of

^{74/} LEA Brief at 31.

decision, did not need to be recirculated because "the basic conclusions of the FES [were] unchanged by [its] findings."^{75/} Recirculation of the FES is required only where there has been a fundamental omission or the "proposed project has been so changed by the Board's decision as not to have been fairly exposed to public comment during the initial circulation of the FES." Public Service Co. of Oklahoma (Black Fox Station, Units 1 and 2), ALAB-573, 10 NRC 775, 786 (1979). See also 10 C.F.R. §51.92(a)(2); Florida Power & Light Company (Turkey Point Nuclear Generating Station, Nos. 3 and 4), ALAB-660, 14 NRC 987, 1014 (1981). LEA has pointed to no such omissions which could arguably indicate a discrepancy of that magnitude in the Limerick FES, nor did the evidence adduced before the Licensing Board indicate any such omission. At most, LEA's argument is that the Limerick FES was insufficient with respect to the details of its inquiry into various effects of severe accidents, a fairly limited portion of the FES addressing risks which are "clearly small." LEA certainly does not contend that the Staff totally failed to evaluate such effects. Accordingly, there is no need for recirculation of the FES as modified by the Board's decision.^{76/}

^{75/} LBP-84-31, supra, 20 NRC at 553. The PID has now been forwarded to EPA. See letter from A. Schwencer, Division of Licensing, NRC to Allan Hirsch, Director, Office of Federal Activities, U.S. Environmental Protection Agency dated December 8, 1984.

^{76/} LEA's reliance on Grazing Fields Farm v. Goldschmidt, 626 F.2d 1068 (1st Cir. 1980), for the proposition that "studies and analyses that are contained in the administrative record of an agency, but not incorporated in any way into the environmental impact statement, cannot bring an EIS that by itself is deficient into compliance with NEPA," is misplaced. LEA Brief at 32. In that case, involving alternatives to a proposed highway alignment, the

(Footnote Continued)

In the case at hand, the evidence adduced at hearing fully revealed that the designated information was contained in, or could be derived from the FES, or was irrelevant. Even if this information should have been included in the FES, which the Licensing Board correctly found was unnecessary, it was disclosed by the Board's decision and became a part of the record of decision pursuant to 10 C.F.R. §50.102(c).

E. The Record Of Decision Fully
Complied With 10 C.F.R.
§51.103.

LEA contends that the record of decision in this case did not comply with the requirements of 10 C.F.R. §51.03 relating to the identification of alternatives, a discussion of preferences among alternatives and a statement of whether the Commission has taken all practicable measures with its jurisdiction to avoid or minimize harm from the alternative selected.^{77/} This assertion has no merit.

Preliminarily, LEA appears to misconstrue the nature of a "record of decision." 10 C.F.R. §51.102(c) provides that "[w]hen a hearing is held on [a] proposed action . . . , the initial decision of the presiding officer . . . will constitute the record of decision." Thus, to the extent LEA argues to the contrary, it is clear that the Licensing Board's decision, LBP-84-31, constitutes the record of decision in this case.

(Footnote Continued)

agency in question based its decision rejecting a proposed alternative alignment on studies, and oral and written communications which were apparently "scattered through the files of numerous federal and state agencies" 626 F.2d at 1073.

^{77/} LEA Brief at 47.

As to LEA's claim that the alternatives were not discussed, the Board's decision fully discussed the alternative information LEA asserted should have been contained in the FES, to the extent required under NEPA. There was simply no need for the Board to discuss alternatives on other points, including "mitigative actions," because admissible issues for hearing were not put forth by LEA on those issues. Quite simply, to require a Board to sua sponte examine and discuss in its decisions every possible alternative to every facet of the facility is totally infeasible and contrary to the Commission requirements for Board consideration of issues at the operating license stage. 10 C.F.R. §2.760a. Obviously, at the operating license stage, the record of decision need only concern those matters as raised by the parties and as admitted as issues by the Licensing Board. Thus, the Board's record of decision was entirely appropriate in this case and no further steps are required to implement 10 C.F.R. §51.102.

F. The Licensing Board Correctly Rejected
LEA's Challenges to Applicant's Emergency
Plan.

1. The Evidence Established That
Applicant's Emergency Facilities
Will Meet All Regulatory
Requirements.

LEA appeals the Licensing Board's findings that Applicant's emergency response facilities, when operational, will fully comply with regulatory requirements. The facilities encompassed by LEA Contention VIII-8(b) are the Emergency Operations Facility ("EOF"), Technical Support Center ("TSC"), and the Operations Support Center ("OSC") for Limerick. The contention alleged that Applicant's Emergency Plan was insufficient to assess compliance with the design criteria in the regulations and regulatory guidelines.

LEA's basic argument is that the Licensing Board should have held the record open until each of these facilities had been fully completed and inspected by the NRC Staff for compliance with regulatory guidelines.^{78/} LEA therefore assumes that Staff approval of these facilities

^{78/} On appeal, LEA relies principally upon NUREG-0696, "Functional Criteria For Emergency Response Facilities" (February 1981) and NUREG-0814, "Methodology for Evaluation of Emergency Response Facilities" (Draft August 1981). Neither of these documents provides regulatory requirements. NUREG-0696 itself states in the Abstract that it will be used by the NRC Staff in evaluating compliance with 10 C.F.R. Part 50, Appendix E, Article IV.E.8 and Appendix A, General Design Criterion 19. Specifically, NUREG-0696 "is not a substitute for the regulations, and compliance is not a requirement." See Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), ALAB-698, 16 NRC 1290, 1298-99 (1982) (NUREG-0654 not equal to regulatory requirements). Similarly, NUREG-0814 states in the Abstract that it contains questions which "represent only one approach to meeting the regulations," and further states that "other techniques are equally acceptable but

(Footnote Continued)

was a prerequisite to dispositive Licensing Board findings favorable to the Applicant on this issue. LEA has confused, however, the Staff's role in making the findings required by 10 C.F.R. §50.57(a) and its separate role in providing testimony in a hearing. The findings which must be made by the Staff pursuant to 10 C.F.R. §50.57(a) prior to issuance of an operating license are independent of the hearing process.^{79/} Of principal relevance here is the finding required in subsection (1) that "[c]onstruction of the facility has been substantially completed, in conformity with the construction permit and the application as amended, the provisions of the Act, and the rules and regulations of the Commission." By the express terms of the regulation, this review is performed once the plant has been constructed or substantially constructed. In contrast, hearings on safety issues may be held well before completion of construction if the record and Staff evaluation are sufficiently advanced to demonstrate that, when completed and operational, particular components and systems at issue will adequately

(Footnote Continued)

are not included for the sake of brevity." Both documents, therefore, are intended solely for the purpose of assisting the Staff reviewer in determining whether regulatory requirements have been met.

^{79/} It is well established that licensing boards have no authority to direct the NRC Staff in the performance of its nonadjudicatory administrative functions. Carolina Power & Light Company (Shearon Harris Nuclear Power Plant, Units 1, 2, 3 and 4), CLI-80-12, 11 NRC 514, 516 (1980). There are many cases which enunciate the basic principle that the NRC Staff and licensing boards have independent functions in the licensing process. See, e.g., Consumers Power Company (Midland Plant, Units 1 and 2), Docket Nos. 50-329 and 50-330, "Memorandum and Order (Denying Motion to Require Caseload Forecast Panel to Evaluate Construction Completion Date)" (May 25, 1984) (slip op. at 2) (collecting cases).

perform their intended safety function and thereby provide reasonable assurance of the public health and safety.

In this regard, LEA's argument on appeal is fundamentally inconsistent with the wording of its contention. Nothing in Contention VIII-8 as admitted suggests that the "as built" facilities would be the subject of litigation. Rather, the contention alleges that the plan's descriptions of these facilities "are all insufficient to meaningfully assess compliance with [the regulations] and to evaluate the facilities with respect to the [NUREG] criteria." In short, LEA contended that "the applicant has not demonstrated that the facilities proposed are adequate" (emphasis added). Put differently, this was not a contention involving consideration of the "as built" components of the plant. Thus, litigation of this contention involved an evaluation of design criteria rather than the physical plant as constructed. As the board noted, "litigation on emergency planning is first and foremost concerned with the plans."^{80/}

Accordingly, the Licensing Board properly rendered its decision based upon the existing record. Applicant's witnesses testified that the physical layout as well as equipment, documents and supplies necessary for the efficient and reliable operation of its emergency facilities were described in Sections 7.1.2, 7.1.3 and 7.1.4 of its Emergency Plan and that, when fully functional, those facilities will meet the

^{80/} LBP-84-31, supra, 20 NRC at 528 (emphasis added). The Board also noted that "the criteria for judging the facilities - NUREG-0696 and NUREG-0814[0818] - are well-known and not particularly controversial - and not at all controversial in this proceeding." Id. at 527-28.

requirements of NUREG-0737, Supp. 1 (Boyer, et al., ff. Tr. 9772, at 6-7).^{81/} Similarly, the Staff witness testified that the "Applicant's Emergency Response Facilities (ERFs) are addressed in the April 15, 1983 letter, Boyer, PECO, to Eisenhut, NRC, which commits that the Applicant's ERFs will meet all the requirements of Section 8 of Supplement 1 to NUREG-0737 which describes the NRC basic requirements for ERFs" (Sears, ff. Tr. 9776, at 10). At the hearing, Applicant's panel of expert witnesses was available for cross-examination regarding the adequacy of these facilities. Nonetheless, LEA chose to focus solely on the fact that the Staff had not yet completed its review of those facilities.

In short, LEA put nothing in the record to rebut the Staff's and Applicant's testimony and the evidence in Applicant's plans that the facilities will fully meet all applicable design criteria.^{82/} LEA was simply unable to elicit any testimony in its cross-examination of Applicant's witnesses supportive of its case and apparently wished to

^{81/} NUREG-0737, Supp. 1, "Requirements for Emergency Response Capability (Generic Letter No. 82-33)" (December 17, 1982), incorporates the guidance provided in NUREG-0696 and NUREG-0814. Each of these documents is discussed in Section 8 of NUREG-0737, Supp. 1, and each is listed at page 25 as a reference document. Accordingly, if an applicant meets the guidelines of NUREG-0737, Supp. 1, it has also met the guidelines under NUREG-0696 and NUREG-0814. NUREG-0737, Supp. 1 lists in Section 8.1 each of the regulations for which compliance is necessary with regard to an applicant's emergency response facilities.

^{82/} Practically all of LEA's examination of witnesses on this issue related to the reliability of the equipment, instrumentation and data systems located in the TSC. Applicant's witnesses demonstrated a high degree of knowledge and competence in responding to these questions. Their testimony established the reliability of the equipment (Applicant's panel, Tr. 10074-81).

keep the record open in the hope that something would turn up later. As the Licensing Board succinctly stated, LEA "raised no issue based on any of [the] information" in the plans and "no specific concern that any of these facilities will not meet a particular requirement."^{83/}

LEA's remaining points regarding its right to a hearing are therefore inapposite. The Licensing Board did not hold that its disposition of this contention favorably to Applicant depended upon the outcome of the Staff's review. Rather, it merely declined to hold open the record as requested by LEA until the Staff's review had been completed.^{84/} Because there were no issues left unresolved from the hearing, no hearing right was violated. The Board found that LEA failed to establish any specific deficiency in the plans, and also failed to impeach or refute the Staff's and Applicant's testimony which proved that the plans for these facilities meet all applicable design criteria in NUREG-0737, Supp. 1. Hence, no issue was "removed" from the hearing or improperly delegated to the Staff.^{85/}

^{83/} LBP-84-31, supra, 20 NRC at 528 (emphasis added).

^{84/} Under 10 C.F.R. §2.743(g), any safety evaluation prepared by the Staff must be offered in evidence. There is no requirement, however, that a hearing on any safety issue be delayed until completion of the Staff's safety evaluation of the matter at issue. Compare 10 C.F.R. §51.104. The testimony by both the Applicant and Staff, as well as the plan itself, provided sufficiently "reliable, probative, and substantial evidence" to support the Licensing Board's decision. See 10 C.F.R. §2.760(c).

^{85/} Insofar as LEA asserts that the subsequent appraisal of Applicant's emergency response facilities showed deficiencies (LEA Brief at 35 n.27), it could have sought, but did not seek, a timely reopening of the record. As discussed above, the Staff's independent review is not automatically or necessarily incorporated into the hearing process.

2. The Licensing Board Properly Found
Applicant's Plans Adequate for
Medical Care for Onsite Contaminated
Injured Victims.

LEA asserts that Applicant's Emergency Plan is inadequate because it does not provide a second alternative hospital, in addition to the primary and secondary hospitals designated in the plan, for the treatment of contaminated injured victims. LEA's claim is without legal authority under the NRC's regulations, Commission precedents, or even the guidance provided in NUREG-0654.^{86/} Moreover, there is no basis in the record for LEA's assertion that the primary and secondary hospitals designated in the plan cannot adequately provide the medical services required under these regulations and precedents. Specifically, there has been no showing why the "prudent" planning for medical services required by the Commission necessitates the addition of yet another hospital to provide further backup support.

As the Licensing Board found, the planning standard under 10 C.F.R. §50.47(b)(12) requires that "[a]rrangements are made for medical services for contaminated injured individuals."^{87/} Under NUREG-0654,

^{86/} NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (November 1980).

^{87/} The more particularized requirements under 10 C.F.R. Part 50, Appendix E, Article E, are:

3. Facilities and supplies at the site for decontamination of onsite individuals;

4. Facilities and medical supplies at the site for appropriate emergency first aid treatment;

5. Arrangements for the services of

(Footnote Continued)

Criterion L.1, an applicant is required to "arrange for local and backup hospital and medical services having the capability for evaluation of radiation exposure and uptake, including assurance that persons providing these services are adequately prepared to handle contaminated individuals."

On the record, Applicant demonstrated its compliance with the terms of this standard by reason of its agreements with the Pottstown Memorial Medical Center ("Pottstown Memorial") and the Hospital of the University of Pennsylvania ("HUP").^{88/} LEA argues, however, that HUP does not constitute an adequate "backup" under NUREG-0654, Criterion L.1.

LEA's argument necessarily fails because it has not identified any reason why HUP cannot perform its intended backup function. Its claim is based solely on the fact that HUP is located in Philadelphia, approximately a 45 minute drive from the Limerick facility. The Licensing Board unanimously agreed that "prudence requires that the hospital assigned the treatment of traumatic injury be reasonably close to the

(Footnote Continued)

physicians and other medical personnel qualified to handle radiation emergencies on-site;

6. Arrangements for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary;

7. Arrangements for treatment of individuals injured in support of licensed activities on the site at treatment facilities outside the site boundary; . . .

^{88/} LEA notes that Applicant's agreement with HUP exists under an umbrella agreement between HUP and Radiation Management Corporation ("RMC") for RMC's client referrals. LEA does not, however, challenge the validity or effectiveness of arrangements for HUP, which the Board found adequate. See LBP-84-31, supra, 20 NRC at 531-32.

plant."^{89/} Yet, there was no finding by the Board, nor any basis in the record for a contrary finding, that HUP was too distant from the plant to perform its intended backup function for the treatment of traumatic injuries. Accordingly, there is no basis in the record to require a third hospital.

Rather, LEA assumed, as did the dissent, that a third hospital would be advisable in case the EPZ is evacuated. Both the majority and the dissenting member of the Board agreed that there was only a remote likelihood that the EPZ might be evacuated, but their discussion of probability obscured the central point that a postulated evacuation would render use of any hospital in the EPZ problematical at best. Neither LEA nor the dissent puts forth a particular contingency for which a third hospital would provide greater protection than HUP. It is the Commonwealth of Pennsylvania's position in emergency planning that evacuation, if recommended, would encompass the entire 10-mile EPZ in a 360-degree radius (Tr. 10236). Thus, even if Pottstown Memorial were unavailable because of a total evacuation of the EPZ, there is no basis for finding that any other hospital within the EPZ is any more likely to be available.

Conversely, as demonstrated above, there is no basis in the record upon which to find that any hospital outside the EPZ would be able to provide more efficient or effective backup medical capability than

^{89/} LBP-84-31, supra, 20 NRC at 534.

HUP.^{90/} Indeed, the NRC has never required an applicant in any other instance to make even preliminary arrangements for further backup support by additional hospitals (Tr. 9929-31).^{91/}

LEA's claim of error proceeds upon an erroneous reading of the Commission's decision in San Onofre.^{92/} In that case, the Commission stated that the underlying assumption of the NRC's emergency planning regulations is that a serious accident may occur, which presumes that members of the public may become contaminated or exposed to excessive radiation. In other words, the need to adopt prudent measures for medical emergencies cannot be ignored simply because of the remote likelihood that a serious accident will ever occur. From this, LEA asserts that "any analysis of the adequacy of applicant's medical arrangements must assume the unavailability" of Pottstown Memorial.^{93/}

This is a non sequitur. The underlying assumption of a serious accident in the regulations and NUREG-0654 does not require further assumptions that particular planning components will fail or that

^{90/} The dissent was especially vague on this point. The dissent posited that "the third hospital should be less vulnerable to evacuation, and significantly more accessible than HUP," but admitted that those considerations were insufficient to provide a "simple rule for choosing this third hospital." LBP-84-31, supra, 20 NRC at 537. The dissent stated that it would not even require "that the third hospital be outside the plume EPZ." Id.

^{91/} The Staff witness was particularly knowledgeable on this point because, as stated in note 102, infra, he is responsible for review of emergency planning for operating reactors in the United States.

^{92/} Southern California Edison Company (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-83-10, 17 NRC 528, 533 (1983).

^{93/} LEA Brief at 43 (emphasis in original).

planned support services will be unavailable. If such were the case, the planner could never rest. Rather, the standard enunciated in the regulations is that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency."^{94/}

In analyzing planning measures to determine whether the requisite "reasonable assurance" exists, a board must necessarily evaluate each measure in the context of circumstances as they may be expected to develop in an actual emergency. Obviously, a "worst-case scenario" must be assessed, but the Commission has held that even this necessitates only "prudent" planning. In San Onofre, the Commission discussed this principle with regard to medical services and expressly authorized arrangements to expand existing facilities and capabilities on an ad hoc basis.^{95/} It stated:

It was never the intent of the regulation to require directly or indirectly that state and local governments adopt extraordinary measures, such as construction of additional hospitals or recruitment of substantial additional medical personnel, just to deal with nuclear plant accidents. The emphasis is on prudent risk reduction measures. The regulation does not require dedication of resources to handle every possible accident that can be imagined. The concept of the regulation is that there should be core planning with sufficient planning

^{94/} 10 C.F.R. §50.47(a)(1). As to onsite planning, the NRC's finding is based upon "whether the applicant's onsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented." See 10 C.F.R. §50.47(a)(2).

^{95/} As the Commission noted, victims of contamination can receive adequate treatment on a long-range, ad hoc basis. It is only the victim suffering trauma who requires immediate attention. San Onofre, supra, CLI-83-10, 17 NRC at 535-36.

flexibility to develop a reasonable ad hoc response to those very serious low probability accidents which could affect the general public.

.

While some immediate action may be required, the number of individuals both onsite and offsite who may become contaminated and injured is expected to be very few. The Commission believes it is prudent to identify local or regional medical service facilities considered capable of providing support for contaminated injured individuals. Additionally, emergency service organizations within the EPZ should be provided with information concerning the capability of medical facilities to handle individuals who are contaminated and injured. This information, in conjunction with the core services to deal with onsite personnel and emergency workers, should be sufficient to accommodate members of the general public and could be expanded as necessary on an ad hoc basis.^{96/}

Thus, even when considering the total number of onsite and offsite contaminated injured victims, the Commission has determined that it is sufficient to provide "core services" as supplemented by identification of local or regional facilities considered capable of providing support. Applicant's arrangements for medical services with HUP, which commits rather than merely identifies its medical capabilities for contaminated injured victims, satisfy this requirement. Also, Applicant has

^{96/} San Onofre, supra, CLI-83-10, 17 NRC at 533, 535 (emphasis in original) (footnotes omitted). The Commission referred to an estimate by the Appeal Board of "from one to perhaps 25 or so" contaminated, injured victims who could be expected to require immediate treatment. Id. at 535 n.10.

identified a number of other hospitals in the Limerick vicinity (Tr. 9906, 9911) which could be called upon for additional support.^{97/}

It was unnecessary for the Licensing Board to possess "detailed knowledge of the specific abilities and training of the emergency medical service personnel at these potential alternative receiving hospitals"^{98/} because, as the Board found, no hospital in the area would refuse to accept a contaminated injured patient. All such hospitals are accredited by the principal national accrediting organization, the Joint Committee on Hospital Accreditation ("JCHA"), which requires that each accredited hospital have some plans for treating contaminated injured patients.^{99/} Given the basic accreditation process and the Commission's recognition that backup facilities can supplement

^{97/} The Board noted that the offsite emergency plans for Limerick identify 20 hospitals in the three risk counties with radiation exposure/contamination treatment capability. LBP-84-31, supra, 20 NRC at 535. Despite its objection (LEA Brief at 45 n.42), LEA had previously been served with those plans and does not on appeal challenge the accuracy of the statements cited by the Board majority. The Board merely took official notice of those hospitals to identify them as possible supplements to the "core services." Such official notice is permitted under 10 C.F.R. §2.743(i). Again, LEA has not controverted this finding by any showing, or sought to reopen the record to repudiate it.

^{98/} LBP-84-31, 20 NRC at 535.

^{99/} Id. at 534. The Board relied principally upon the testimony of Dr. Linnemann, an expert in the area of treatment of contaminated injured victims. Dr. Linnemann testified that, in its accreditation process, JCHA reviews each hospital's plans to determine the adequacy of its capability for treatment of contaminated injured patients (Tr. 9912-14, 9950-51).

core services on an ad hoc basis if required, it was unnecessary for the Board to reach more detailed conclusions.^{100/}

Finally, although it was unnecessary to discuss probabilities in order to determine the adequacy of existing medical capabilities, the Licensing Board evidently agreed with the Staff's planning expert and Applicant's medical expert^{101/} that the probability of a hospital evacuation during a radiological emergency is "vanishingly small."^{102/}

^{100/} As Dr. Linnemann testified, hospitals maintain contingency plans for any kind of contingency or emergency which would require it to be shut down and/or to shuttle patients to a nearby hospital, depending on their condition (Tr. 9906, 9911). Thus, the situation as regards a possible radiological emergency is indistinguishable from any other kind of circumstance (e.g., an earthquake) in which a severe trauma victim would be transported from one hospital to another (Tr. 9841-42, 9906, 9911).

The dissent argued that if JCHA accreditation were sufficient to guarantee adequate care for contaminated injured victims, "there would be no need to provide Pottstown Memorial with special training and equipment." LBP-84-31, supra, 20 NRC at 537. The dissent, however, overlooked the fact that Pottstown Memorial could rapidly make its trained personnel and equipment available to a nearby hospital at which a contaminated injured patient would be received. The dissent and majority agreed that there is no obstacle to the timely completion of the training and equipping of Pottstown Memorial personnel, and that, as to equipment, "nothing is required which is especially difficult to acquire." Id. at 533.

^{101/} The Staff's witness was John R. Sears, a Senior Reactor Engineer with the Emergency Preparedness Branch, Division of Emergency Preparedness and Engineering Response, Office of Inspection and Enforcement. Since 1976, Mr. Sears has served as the reviewer responsible for review of emergency planning for operating reactors in the United States. See ff. Tr. 9776, Professional Qualifications of John R. Sears at 2. Applicant's principal witness on medical services was Dr. Roger E. Linnemann, who specializes in the areas of radiobiology, radiology and nuclear medicine. See ff. Tr. 9772, Professional Qualifications, Roger E. Linnemann, M.D.

^{102/} LBP-84-31, 20 NRC at 534. As Dr. Linnemann stated, only a
(Footnote Continued)

In Diablo Canyon,^{103/} the Commission expressly authorized licensing boards to consider such probabilities in determining whether emergency planning measures are prudent and adequate. In determining that a board need not consider the contemporaneous occurrence of an earthquake and a radiological release from the plant, the Commission held "that earthquakes of sufficient size to disrupt emergency response at Diablo Canyon would be so infrequent that their specific consideration is not warranted."^{104/} As the Commission noted, "emergency plans do have considerable flexibility" to handle such unforeseen events if they should occur.^{105/}

Accordingly, the record supports the Board's conclusion that contaminated injured victims could be adequately treated at Pottstown Memorial and HUP. In the extremely remote likelihood that other medical support would be required, further ad hoc arrangements could be made by coordinating activities among Pottstown Memorial, HUP and nearby hospitals, just as they would be in the event of a serious non-radiological emergency.

(Footnote Continued)

life-threatening situation could justify hospital evacuation, and radioactive releases from a nuclear power plant are not immediately life-threatening (Tr. 9941). Under those circumstances, Dr. Linnemann found it difficult to postulate any radiological emergency in which a hospital would be totally closed and unable to receive patients who require life-saving measures (Tr. 9906). Dr. Linnemann further testified that, in any event, all hospitals evacuate for a number of reasons (chlorine gas, earthquakes, fires) under contingency plans which include the handling of contaminated patients (Tr. 9941, 9944).

^{103/} Pacific Gas and Electric Company (Diablo Canyon Nuclear Power, Units 1 and 2), CLI-84-12, 20 NRC 249 (1984).

^{104/} Id. at 252 (emphasis added).

^{105/} Id. at 253.

II. AWPP Appeal

AWPP's appeal questions generally the Licensing Board's finding that emissions from the Limerick cooling towers will not cause or exacerbate carburetor icing in aircraft. It also appeals various actions taken with respect to the Licensing Board's treatment of its contention relating to quality assurance.

A. The Licensing Board's Challenged Evidentiary Findings Relating To Carburetor Icing Are Correct And Based Upon The Evidence Of Record.

While the basis of its appeal is decidedly unclear, AWPP apparently is arguing that the Licensing Board's findings regarding Contention V-4 are unsupported by the record evidence. Contention V-4 states:

Neither the Applicant nor the Staff have adequately considered the potential for and the impact of carburetor icing on aircraft flying into the airspace that may be affected by emissions from the Limerick cooling towers. 106/

Applicant fully supports the reasoning and findings of the Licensing Board in disposing of this contention.^{107/} Therefore it will summarize the Board's findings and address only the matters raised by AWPP in its brief.

The Board analyzed this contention from a number of perspectives in its PID and determined that it had no merit. Initially, the Board examined whether cooling tower plumes from Limerick could cause conditions significantly different from those otherwise present in the

106/ LBP-84-31, supra, 20 NRC at 454.

107/ Id. at 454-64.

atmosphere such that carburetor icing potential could be attributable to cooling tower emissions and, if so, whether pilots are sufficiently trained and equipped to deal with such incidents.^{108/} The Board examined the conditions within cooling tower plumes and found that while plumes contain large variations in temperature and humidity relative to the surrounding ambient air immediately after leaving the tower orifice, such variations subside quickly and do not persist beyond one-quarter mile. Thus, the Board was able to conclude that the carburetor icing potential of the airspace affected by the Limerick cooling tower plume emissions was not significantly different than the surrounding airspace.^{109/}

The Board also examined the height to which plumes can be expected to rise and found that if they are visible at all, they will not level off below 1,000 feet and are unlikely to do so before reaching 1,200 feet, and therefore will not affect local airport traffic patterns.^{110/}

While finding that conditions within and surrounding plumes do not differ significantly from the ambient air in terms of carburetor icing potential, the Board additionally examined the effect of flying through and across plumes up to ten miles in length. It was satisfied that such plumes would not allow enough time to form carburetor icing sufficient to significantly affect the performance of aircraft, even assuming that pilots did not utilize carburetor heat and that plumes present

^{108/} Id. at 456-59, 462-64.

^{109/} Id. at 456.

^{110/} Id. at 457-58.

carburetor icing potential different from the surrounding airspace in the first place.^{111/}

The Board also found that aircraft are equipped and pilots trained to accommodate carburetor icing. Thus, even if there were an increased potential for carburetor icing as a result of cooling tower operation, pilots are sufficiently trained to deal with it and there is sufficient time for reasonably attentive pilots to detect and take the prescribed corrective actions necessary to safely eliminate the problem.^{112/} Pilots must and do contend on a regular basis with much larger variations in atmospheric conditions, i.e., temperature and humidity, than will be presented by the cooling tower plumes.^{113/}

The Board's decision is based upon the overwhelming weight of the evidence and supported by the testimony of well qualified witnesses with education, training and experience in meteorology and the study of cooling tower plumes and with extensive flight experience. In contrast, AWPP presented a single witness with regard to the meteorology and plume behavior whom the Board determined to have insufficient knowledge and expertise to be relied upon.^{114/} Where the demeanor and credibility of witnesses are at issue, the determination by the Licensing Board of the relative weight to be accorded their testimony deserves great

^{111/} Id. at 461-62.

^{112/} Id. at 462-63.

^{113/} Id. at 464.

^{114/} Id. at 455-56.

weight.^{115/} AWPP has shown absolutely nothing to disturb the Board's findings or the weight to be accorded the witnesses' testimony.

The most obvious error in AWPP's argument is its repeated mis-citation to the testimony of Staff witness Geier whom AWPP asserts to have testified that "carburetor ice can form instantaneously."^{116/} In actuality, Mr. Geier stated in his testimony:

A5. The accumulation of carburetor ice, i.e. the rate and/or amount, is dictated by many factors: the temperature of the ambient air, the amount of moisture in the air, the rate of movement of the air through the carburetor inlet, the volatility of the fuel. The effect of the ice is also dictated by certain factors

. . . .

Although ice can form instantaneously under the proper conditions, it does not accumulate at such a rate that the pilot who pays attention to the signs cannot prevent engine stoppage due to

^{115/} Toledo Edison Company (Davis-Besse Nuclear Power Station, Units 1, 2 and 3), ALAB-560, 10 NRC 265, 334 (1979); Duke Power Company (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397, 404 (1976). The heart of AWPP's misconceptions appear to be the fact that a layman cannot look at a cooling tower plume and draw conclusions concerning its physical makeup and the processes which are taking place as it interacts with the surrounding atmosphere. An expert's knowledge of meteorology and cooling tower plumes is necessary to draw valid conclusions. Merely because a visible plume extends for a number of miles does not, ipso facto, prove that the conditions inside are significantly different from the surrounding airspace.

^{116/} AWPP Brief at 2. See also AWPP Brief at 3, 7, 8. Mr. Geier is Manager, General Aviation and Commercial Division Office of Flight Operations, FAA. He has been a pilot for 41 years and has significant experience in aircraft operation and maintenance. Testimony of Bernard Geier Concerning the Impact of Cooling Tower Plumes on Induction (Carburetor) Icing of Aircraft, ff. Tr. 6883 at 1 and Professional Qualifications of Bernard Geier, attached thereto.

blocking by ice of the carburetor throat.
(emphasis supplied) 117/

This statement is fully consistent with the testimony of Applicant's witnesses and other Staff witnesses that there is sufficient time for an attentive pilot to apply carburetor heat after indications of the onset of carburetor icing, but before it causes irreversible problems. While Staff witnesses were unwilling to state that there was a particular minimum time in which to remedy the buildup of carburetor ice because of the types of aircraft, engines and environmental conditions involved, they did testify unequivocally that there was sufficient time for an attentive pilot to take action.^{118/} This unproven thesis that carburetor ice can build up and disable an aircraft instantly pervades AWPP's brief. Inasmuch as this basic tenet is fallacious, the resulting conclusions in the brief are unsupportable and incorrect. AWPP would reference extra-record material in an attempt to demonstrate its hypothesis that disabling levels of carburetor icing can form instantaneously.

117/ Geier, ff. Tr. 6883, at 2. He also made this distinction during cross examination by AWPP (Tr. 7002-06). See also Tr. 6367, 6384.

118/ LBP-84-31, supra, 20 NRC at 461-62. AWPP argues, on one hand, that 99% of the planes flying in the Limerick area do not have special instruments to detect carburetor icing and, on the other, states that such special instruments are not considered reliable. AWPP Brief at 2, 13. The Board's findings and the testimony of Applicant and Staff do not rely on such special instrumentation for detection of carburetor ice, but instead rely on instruments found in essentially all small airplanes. Seymour and Smith, ff. Tr. 6234, at 12. The reference in the Board's decision to gauges in Paragraph A-4, LBP-84-31, supra, 20 NRC at 455, is clearly to those measuring engine rpm or manifold pressure and not to any special carburetor icing instrument.

Reliance on such documents in existence at the time of the hearing is clearly prohibited.^{119/}

AWPP also erroneously postulates that stagnant meteorological conditions near the surface would be significantly increased because of the cooling tower plumes. AWPP presented no rational basis to support this thesis at the hearing. Tr. 6838-41. Initially, completely "stagnant" conditions are an extreme rarity. Second, even if the air near the ground were completely stagnant, the plumes would rise above and be dispersed by winds aloft. Tr. 6299-303, 6408-10. Third, the addition of the maximum amount of moisture from the towers to that already in the atmosphere will not constitute a significant addition. Smith and Seymour ff. Tr. 6234 at 5, 14; Tr. 6249, 6407, 6713, 7050-51. The evidence is overwhelming that the postulated increase in localized moisture due to cooling tower plumes will not occur.

AWPP objects to the use of experimental evidence relating to cooling tower tests performed by Pennsylvania State University as

^{119/} See Public Service Electric & Gas Company (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 NRC 43, 49; Public Service of Indiana (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-459, 7 NRC 179, 191 (1978). Even if considered on their face, the two articles cited by AWPP would not affect the reasoned decision based upon the expert testimony of the witnesses. The statement in Safety Corner at p. 110 that ice can form in less than a half minute under the right circumstances is neither documented nor are the "circumstances" explained. In any event, the passage appears to relate to a discussion of the performance of an optical probe to give timely indication of carburetor icing. Neither does the November 1980 Aero Magazine excerpt support AWPP's argument. The author never defines "very rapidly" when speaking of ice formation in a carburetor and the page provided by AWPP with its brief seems to focus upon the difficulty of post-accident identification of carburetor ice, rather than on initial detection by a pilot.

applied to the Limerick towers.^{120/} AWPP had a full opportunity to explore the witnesses' knowledge of the Penn State study, the conduct of such tests, the conclusions and their applicability to the Limerick towers.^{121/} Contrary to the AWPP assertion,^{122/} an expert need not personally conduct all experiments upon which he relies, but may rely upon the work of other experts.^{123/}

AWPP asserts that the Limerick towers are different than the ones studied in the Penn State experiments thus making any use of such results impermissible.^{124/} However, these differences were considered by the Applicant's and Staff's experts, both as to physical size, surrounding terrain, meteorology, and location, and were found not to be significant.^{125/} AWPP has not pointed to any contrary evidence which was overlooked by the Licensing Board.^{126/}

^{120/} AWPP Brief at 3-5.

^{121/} AWPP had ample opportunity to present the testimony of experts on this matter who might have supported its thesis, but did not do so.

^{122/} AWPP Brief at 1, 5.

^{123/} Wisconsin Electric Power Company (Point Beach Nuclear Plant, Unit 2), ALAB-78, 5 AEC 319, 332-33 (1972); Tennessee Valley Authority (Hartsville Nuclear Plant, Units 1A, 2A, 1B and 2B), ALAB-554, 10 NRC 15, 27 (1979).

^{124/} AWPP Brief at 3-4.

^{125/} See, e.g., Smith and Seymour, ff. Tr. 6234 at 6; Tr. 6423-35, 6444-45, 7033-35, 7087.

^{126/} AWPP asserts that "carburetor ice at certain distances from the tower" was not even mentioned in the Penn State Study. AWPP Brief at 4. The purpose of this study was to measure ambient temperature and humidity both inside and outside of plumes which are essential physical parameters for the study of carburetor icing.

Applicant's witnesses were able to describe in detail the methodology of the Penn State Study, including the basis for the statement that readings were taken both inside and outside the invisible plume.^{127/} AWPP then states that this study did not conclude that conditions regarding carburetor icing did not exist more than approximately one-quarter mile from the tower.^{128/} The study was used by Applicant's witnesses who themselves drew this conclusion based upon, *inter alia*, the published results of the study. Smith and Seymour, ff. Tr. 6234, at 5-6.^{129/} The Staff concurred in this assessment.^{130/} AWPP also alleges that since the moisture and warm air emitting from the towers only condense to form a visible plume 50-80% of the time, there may be a substantial period during which the plume would be invisible. On this basis, it concludes that a pilot flying through the plume would not take corrective actions.^{131/} Initially, whether the plume is

^{127/} See, e.g., Tr. 6259-60, 6262, 6279, 6405, 6418-20.

^{128/} AWPP Brief at 1. AWPP states that since visible plumes travel more than one-quarter mile, Applicant's entire case is incorrect. AWPP Brief at 5. AWPP misapprehends the evidence which indicates that with regard to carburetor icing, there is no significant difference between a plume and the surrounding atmosphere in terms of temperature and moisture content beyond one-quarter mile, not that a visible or invisible cooling tower plume cannot extend beyond that distance.

^{129/} Applicant's witnesses used a very conservative definition of temperature and humidity differences in assessing whether an increased potential for carburetor icing existed in a cooling tower plume. Tr. 6249, 6267; Smith and Seymour ff. Tr. 6234, Figures 1 and 2.

^{130/} See Tr. 7106-07.

^{131/} AWPP Brief at 4.

invisible or not, the evidence demonstrates that beyond one-quarter mile, the conditions are not substantially different than that of the surrounding air. Second, this situation is no different than a pilot encountering icing conditions in ordinary flight to which he would have to respond. Tr. 6356-57, 6367, 6646-47. Even AWPP's witness, Mr. Romano, recognized this. Tr. 6772-75.

AWPP had an adequate opportunity to cross-examine the Applicant's and Staff's witnesses as to the basis of their conclusions. On appeal, AWPP has failed to show that the Board's conclusions regarding the Penn State Study were not properly based upon the record. AWPP also alleges an inconsistency between testimony of Mr. Smith regarding assurances that Penn State researchers had intersected the plume and the difficulty in instrumentation detecting the plume beyond approximately one-quarter mile.^{132/} The fact that the differences between the inside and outside of the plume were small and difficult to experimentally measure does not mean that the method used to intersect the plume was inadequate.^{133/} AWPP has failed to show any inconsistency in the Board's decision at Paragraph A-16.^{134/}

AWPP complains that its representative, Mr. Romano, "was not given [his] legal right to cross examine as [his] own witness" ^{135/} Mr. Romano was provided an opportunity to cross-examine Applicant's and

^{132/} AWPP Brief at 5.

^{133/} Tr. 6258-60, 6262, 6279, 6419-20, 6458-59.

^{134/} LBP-84-31, supra, 20 NRC at 458.

^{135/} AWPP Brief at 5.

Staff's witnesses, advised of the advantages of having counsel present to assist in the examination, and permitted to make a statement in lieu of redirect because of his lack of counsel.^{136/} The legal deficiency alleged is unclear. AWPP was afforded all procedural rights to which it was entitled.

AWPP alleges that Applicant's witness Mr. Smith contradicted himself when he testified that a plume will blend into the cloud deck.^{137/} There is no inconsistency. Witness Smith repeatedly stated that the rise of a plume is determined by a number of factors, i.e., temperature, humidity, the wind and turbulence.^{138/} If the height at which a visible plume ceases to have sufficient upward momentum to continue to rise is occupied by a cloud deck, the plume will mix with that deck. A cloud formation will not prevent a plume from rising and the elevation at which a plume levels off will not necessarily have a cloud deck. See Figures 8 and 9 of PECO Ex. 8. See also Figure 7 which shows plumes rising above ground fog. AWPP also states that if the plume blended into and became part of the ambient cloud deck, which it postulated to be at the pattern altitude of the Limerick airport, "[s]uch low cloud deck in calm saturated air could move slowly over the

^{136/} Tr. 6852-53. Mr. Romano conducted cross-examinations of the Applicant's and Staff's witnesses on behalf of AWPP. Mr. Romano also took the stand as AWPP's only witness and was cross-examined by both Applicant and the Staff.

^{137/} AWPP Brief at 6.

^{138/} See, e.g., Tr. 6295-6297, 6300-01, 6337, 6407.

airport traffic pattern"139/ The point is not clear. If a cloud deck already existed, the effect of the Limerick plume is probabilistic. In any event, as previously discussed, beyond one-quarter of the Limerick plume will not differ substantially from the surrounding air with regard to the potential for carburetor icing.

AWPP asserts that the Board's decision is somehow flawed inasmuch as Applicant's witnesses relied on an experiment involving the length of time necessary to produce detectable carburetor icing which utilized an aircraft carburetor mounted on an automobile engine.^{140/} The uncontradicted testimony indicated, however, that the type of engine was not important to that study inasmuch as it was merely used to induce flow through the carburetor.^{141/} Laboratory conditions were important to assure constant controlled conditions which could not be duplicated in an aircraft in flight.^{142/} AWPP has failed to show that this evidence is not competent and reliable.

AWPP argues that if the carburetor heat were used for a problem having similar symptoms, it could "result in power loss sufficient to cause engine damage, a stall and a probable crash."^{143/} However, the

^{139/} AWPP Brief at 4.

^{140/} AWPP Brief at 7.

^{141/} Tr. 6392, 6507-09.

^{142/} The conditions studied were some of the most severe with regard to the potential for carburetor icing. Tr. 6509.

^{143/} AWPP Brief at 9. See also AWPP Brief at 2 for a similar argument. AWPP cites extra-record material in support of this proposition which it seriously takes out of context. AWPP Brief at 9. The
(Footnote Continued)

testimony of the expert witnesses was that the other problems commonly encountered by a pilot had sufficiently different symptoms so as not to be confused with carburetor icing. Geier, ff. Tr. 6883, at 5. AWPP has not shown why the Board could not reasonably rely upon such testimony.

AWPP complains that Mr. Geier was permitted to correct his testimony before its submission.^{144/} This procedure is not unusual, is proper and was accorded to AWPP's witness Mr. Romano.^{145/} In any event, he had the opportunity to cross-examine Mr. Geier as to the reason for and effect of the changes. No error has been demonstrated.^{146/}

(Footnote Continued)

complete paragraph from the article "Preventing Induction Icing," attached to AWPP's Brief, states:

In aircraft with smaller engines, with no carburetor air or mixture temperature instrumentation, full carburetor heat should be applied as necessary. Carb heat should be shut off for full power operations such as takeoffs and emergency go-arounds. Leaving the heat on could seriously reduce the amount of power available and could damage the engine.

The context is related to full power operations and not to emergency actions necessary to counter icing problems. This paragraph is fully consistent with the testimony of Applicant's and Staff's witnesses. See, e.g., Tr. 6673-76, 7042 which discuss use of carburetor heating during takeoffs.

^{144/} AWPP Brief at 11.

^{145/} For example, Mr. Romano originally did not have the correct name for the aircraft he routinely flies in the testimony. Tr. 6724.

^{146/} AWPP also complains that Mr. Geier's testimony that a pilot could radio the Limerick field for information was incorrect inasmuch as there was no obligation to respond to the call. AWPP Brief at 3. AWPP has failed to state the significance of this fact, even if true, with regard to carburetor icing.

AWPP attacks the Board's findings that variations in the ambient air are significantly greater than those that would be caused by cooling tower plumes as not based upon weather records.^{147/} This information was based upon the testimony of an expert meteorologist, with an example derived from documented experiments in which he participated.^{148/} An adequate opportunity for examination on this subject was given. No error has been shown by AWPP.

AWPP alleges that an item taken from Staff testimony refutes the fact that pilots know that performance degradation means carburetor ice.^{149/} This item which is Attachment B to the Testimony of Harry E.P. Krug Concerning the Impact of Cooling Tower Plumes on Induction (Carburetor) Icing of Aircraft, ff. Tr. 6883 is taken out of context. The introductory paragraph to the language quoted by AWPP appearing on page 19 states that "[e]xisting standard cockpit instrumentation is adequate to alert the pilot of a possible onset of carburetor ice formation." While performance degradation may be caused by other factors, their symptoms are normally sufficiently different that they will not be confused.^{150/} No error has been shown.

Lastly, AWPP asks that the Appeal Board apply a "beyond-a-reasonable-doubt" standard as the burden of proof which the

^{147/} AWPP Brief at 13.

^{148/} Tr. 6356-57, 6367, 6644-47.

^{149/} AWPP Brief at 15.

^{150/} Geiger, ff. Tr. 6883 at 5.

Applicant must meet.^{151/} It is clear that in proceedings before the NRC an applicant must prevail by the preponderance of the evidence.^{152/} Applicant has demonstrated that the Limerick cooling tower plumes will not significantly add to the potential for carburetor icing of aircraft flying into the airspace that may be affected by such plumes. Thus, AWPP's appeal has no merit.

B. The Board's Ruling With Regard To
Welding Quality Assurance Contentions
Are Correct.

With regard to quality assurance matters,^{153/} AWPP is apparently appealing the partial denial of its general contention relating to quality assurance, the order of filing of proposed findings with regard to the admitted portion of the contention set by the Licensing Board, and the denial of the admission of late-filed testimony from a proposed AWPP witness. AWPP also requests that the Appeal Board review a deposition of certain Applicant's witnesses taken during discovery. Applicant submits that the treatment of these matters by the Licensing Board was correct and that the appeal should be denied.

Under the Commission's regulations, it is fundamental that a contention must have specificity and bases to be admissible for litigation. 10 C.F.R. §2.714. In its Special Prehearing Conference

^{151/} AWPP Brief at 15.

^{152/} Commonwealth Edison Company (Zion Station, Units 1 and 2), ALAB-616, 12 NRC 419, 421 (1980) citing Consolidated Edison Company of New York (Indian Point Station, Unit No. 3), CLI-75-14, 2 NRC 835, 839 n. 8 (1975).

^{153/} AWPP Brief at 16.

Order,^{154/} the Board summarized AWPP's contention relating to quality assurance:^{155/}

The proposed contention asserts that the Applicant has failed to establish and carry out an adequate quality assurance program as required by Appendix B of 10 CFR Part 50. Further, Intervenor's assert that 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.

The Licensing Board conditionally admitted the proposed contention:

Although the proposed contention could be made more specific with better articulated bases, nevertheless, the importance of the subject leads us to admit this proposed contention at this early stage of the proceeding, subject to the development of specific contentions and their bases regarding Applicant's alleged construction QA deficiencies and the import of this for the proper construction of the plant and for the ability of Applicant to implement a proper operational QA program.^{156/}

In accordance with the Special Prehearing Conference Order, the Board permitted informal discovery to take place regarding, inter alia, Contention VI-1. There were a number of requests for information and documents relating to his contention responses which were provided to AWPP.^{157/}

^{154/} Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), LBP-82-43A, 15 NRC 1423, 1517 (1982).

^{155/} Another intervenor, Mr. Lewis, initially participated in this general contention, but later decided not to pursue the matter.

^{156/} Id. at 1518.

^{157/} See, e.g., September 3, 1982 letter from Frank R. Romano to Troy B.
(Footnote Continued)

In its Second Special Prehearing Conference Order, the Board noted that it "could perceive no particular pattern from the allegations or summaries of the reports in the contention."^{158/} It recited that it spent considerable time at the prehearing conference "in an attempt to elicit from AWPP just what the alleged pattern is and what specific bases exist to support the allegation of a pattern."^{159/} The Board concluded:

Based on this discussion, we conclude there is no particular pattern being alleged by AWPP. Rather, AWPP is merely relying on the fact that there are many deviations and non-compliances in NRC Staff and Applicant inspection reports over the many years of construction, and that this shows inability of the Applicant to carry out a proper QA program. (AWPP is not alleging that any particular defect still exists. Indeed, the contention asserts that later correction of the items found is irrelevant to the fact that a pattern exists.)

We agree in general with the Applicant and Staff that the mere recitation of unrelated adverse findings in reports of inspections and audits performed by the Staff and Applicant does not supply information on what specifically would be litigated. It suggests a broad, unfocused, item by item cross-examination of the very Staff and Applicant inspectors who reported the problems and approved their resolution. This is to be contrasted with proceedings where particular allegations of specific patterns of QA/QC problems, often based on inspection reports, have been litigated. It is also in

(Footnote Continued)

Conner, Jr. and January 11, 1983 response from Mark J. Wetterhahn to Frank Romano.

^{158/} Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), LBP-83-39, 18 NRC 67, 89 (1983).

^{159/} Id.

sharp contrast with supported allegations of particular existing construction defects. 160/

The Board therefore dismissed the contention.

Subsequently, as a result of Applicant informing the Board that, with regard to the example of alleged welding deficiencies advanced by AWPP, certain welds had not been reinspected as had previously been believed, the Board reconsidered its ruling and admitted a contention relating to welding inspection and quality assurance after allowing AWPP a further opportunity to specify its concerns. See Tr. 4882-95. However, with regard to the remainder of the generalized contentions, the Board found that given the number of inspection reports and follow-ups by the Staff, "AWPP has failed to specifically point us to any particular reason to disbelieve the fact that the work was corrected as stated by the Applicant and the Staff, other than AWPP's general distrust for the Applicant."161/ Certainly general distrust does not present a specific litigable issue. In its appeal, AWPP has pointed to

160/ LBP-83-39, supra, 18 NRC at 89. It should be noted that the Board later permitted such examination with regard to alleged welding deficiencies. The Board also denied an AWPP request for further discovery:

AWPP seeks to conduct further discovery to better specify the contention. We have already permitted AWPP about a year to examine QA/QC documents and it has been unable to frame an admissible contention. Further discovery is unwarranted given AWPP's failure to specify with any reasonable particularity what it would seek to litigate within the broad area of QA/QC.

Id. at 90.

161/ Tr. 4912.

no pattern of quality assurance violations nor any other reason to reexamine the Board's ruling on this contention. As the Appeal Board has recently stated in the Calloway proceeding, error free construction is not a requirement for licensing.^{162/} The Board was correct in denying the contention.

In its brief, AWPP alleges that a pattern of carelessness exists on the basis of "hundreds of official Nuclear Regulatory Commission Inspection and Engineering (sic) (IE) reports on inspections,"^{163/} but fails to relate how these inspection matters were inadequately resolved by Applicant or Staff or the nature of the "pattern." AWPP again notes that it raised a concern relating to concrete placement, but other than a general dissatisfaction with the resolution already considered and rejected by the Licensing Board, points to no present deficiency or pattern.^{164/} The other matters raised by AWPP, e.g., reinforcing roof bolts, use of drills, show no obvious pattern of deficiencies and AWPP has pointed to none.^{165/}

AWPP had more than an adequate opportunity to obtain information supporting its contention. AWPP had the benefit of extensive discovery which gave it a distinct advantage not required by the NRC's Rules of

^{162/} Union Electric Company (Calloway Plant, Unit 1), ALAB-740, 18 NRC 343, 346 (1983).

^{163/} AWPP Brief at 16.

^{164/} See also Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), DD-79-16, 10 NRC 609 (1979).

^{165/} AWPP has merely noted these items without reference to any particular inspection report or other document.

Practice. As interpreted by the Commission, the NRC rules do not contemplate discovery prior to admission of the contention.^{166/} AWPP's representative had access to the Applicant's records which would presumably support his case.^{167/} In summary, AWPP has failed to show that the Board abused its discretion in denying the generalized contention relating to quality assurance.

AWPP alleges that the Board was biased in requiring it to submit its proposed findings on the admitted welding contention prior to those of Applicant or Staff.^{168/} Initially, 10 C.F.R. §2.754(a), in combination with 10 C.F.R. §2.718, permits the presiding officer to vary the order of filing proposed findings. AWPP had the comprehensive written testimony of the parties before it when it submitted findings. It had an opportunity to examine the Applicant's and Staff's responsive findings and was given an opportunity to reply to these on the record.^{169/} No error has been demonstrated.

AWPP asks that the Appeal Board read the entire deposition of two of Applicant's witnesses, Messrs. Boyer and Clohacy which, it is

^{166/} Duke Power Company (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 NRC 1041, 1048 (1983).

^{167/} When the Board did allow litigation of the portion of the QA contention as it related to welding, AWPP was still unable to make any showing of a pattern of welding deficiencies.

^{168/} AWPP also alleges bias because the Board stated that the incompleteness of the weld reinspection was discovered and corrected by Applicant. AWPP Brief at 19. Certainly this observation by the Board, even if incorrect, does not constitute reversible error.

^{169/} Tr. 11915-16.

asserted, "gives a picture different than the hearing testimony."^{170/} Initially, the deposition is not part of the hearing record of this proceeding. Second, AWPP fully cross-examined the two deponents, as well as Mr. Corcoran, and could have used the deposition to attempt to discredit the panel. In any event, the points urged by AWPP for reversal of the Licensing Board decision are unclear. AWPP fails to allege how this deposition, even if it could be used for the purpose which it proposes at this time, demonstrates that particular findings of the Board essential to its decision were incorrect.

The last error alleged by AWPP is the Licensing Board's refusal to hear the testimony of Professor Iversen. The reasons advanced by the Board for its decision are set forth in the transcript and present several independent reasons for rejecting the testimony with which Applicant concurs.^{171/} AWPP cannot continue to hide behind the mantle of "a citizen group without any attorney" to excuse its failure to conform to NRC requirements.^{172/} The requirements for submission of testimony were clear and not legalistic in nature. AWPP had submitted testimony regarding its previously litigated carburetor icing contention and was thus familiar with the Board's minimal requirements. Moreover, the proffered witness had been identified by AWPP in its April 16, 1984 testimony. Dr. Iversen's testimony was only given to the Board and parties the afternoon prior to the commencement of the hearing on

^{170/} AWPP Brief at 20.

^{171/} Tr. 10428-35.

^{172/} AWPP Brief at 21.

Contention VI-1. The lateness was therefore inexcusable. Additionally, the testimony submitted was unrelated to the specific instances of welding deficiencies previously submitted by AWPP. The testimony was entirely conclusory and on its face had no evidentiary weight. AWPP fails to show how specific findings of the Board would have been affected as to the admitted contention even if Dr. Iversen's testimony had been accepted. AWPP has failed to show any alleged error was harmful.

In summary, none of the errors alleged by AWPP with regard to Contention VI-1 have merit and its appeal should be denied.

III. FOE Appeal

Robert L. Anthony and Friends of the Earth in the Delaware Valley (collectively "FOE") question numerous findings of the Licensing Board with regard to Contentions V-3a and V-3b. The Board had found that all of FOE's allegations and speculations of sequence of events omitted from the Applicant's and Staff's analyses to be without merit.^{173/} The Board further found that Applicant had demonstrated reasonable assurance that the safety-related structures at Limerick will withstand the postulated pipeline accidents and thus found FOE's Contentions V-3a and V-3b to be without merit.^{174/}

In its Order (Concerning Proposed FOE Contentions on Hazards from Industrial Activities) of November 22, 1982, the Licensing Board admitted two contentions related to the effect of postulated pipeline accidents in the vicinity of the plant on the operation of the Limerick

^{173/} LBP-84-31, supra, 20 NRC at 493.

^{174/} Id.

Generating Station. As rewritten by the Board, these contentions are as follows:

V-3a. In developing its analysis of the worst case rupture of the ARCO pipeline, the Applicant provided no basis for excluding consideration of siphoning. Thus, the consequences from the worst case pipeline accident are understated.

V-3b. In discussing deflagration of gas and petroleum due to pipeline rupture, no specific consideration has been given to the effect of radiant heat upon the diesel generators and associated diesel fuel storage facilities.^{175/}

The Board's consideration of pipeline effects on the Station went well beyond the wording of these contentions. For example, it considered the effect of the postulated explosions of the contents of the Columbia Gas Transmission Corporation ("Columbia") natural gas pipelines on all safety-related structures of the facility, a matter which is beyond the scope of either contention as stated. As discussed in its decision, the effects of explosions of the Columbia gas pipeline are more limiting than those resulting from a postulated explosion resulting from a break of the ARCO Pipe Line Company ("ARCO") petroleum products pipeline.^{176/}

In summary, the Licensing Board evaluated the potential effects on the Limerick Station of postulated ruptures of the the ARCO and Columbia pipelines of which pass closest to the facility without considering the low probability of such ruptures.^{177/} The Board considered extremely

^{175/} Id. at 465.

^{176/} Id. at 483.

^{177/} The Second Partial Initial Decision contains a complete description of the location, design and operation of the Columbia and ARCO
(Footnote Continued)

conservative accident scenarios that could lead to radiant heat and over-pressure impacts on the Station. In its Partial Initial Decision, the Board discussed extensively the conservatisms contained in the analyses of the Applicant and Staff upon which it relied. These included the amount and distribution of material released from the pipelines, meteorological conditions which were assumed to prevail at the time of the rupture, the mechanisms for transportation and dispersion of the flammable and explosive mixtures in the direction of the Limerick Station and the assumption that unconfined mixtures of natural gas could be detonated. The Board found in its well-documented decision that even assuming burning or detonation of such flammable or explosive mixtures, conservative calculations of radiant heat loads and over-pressures on the safety related structures and the effects of non-safety related structures on safety related structures, demonstrate the adequacy of these structures to withstand the effects of postulated pipeline accidents involving the ARCO and Columbia pipelines. The Board found the Applicant's and Staff's witnesses to be qualified and competent in their respective disciplines and their testimony to be credible and persuasive.^{178/} On the other hand, the Board excluded the proposed testimony of Mr. Anthony and discounted completely the qualifications and testimony of FOE's sole remaining witness as limited in education, training and experience applicable to the issues raised in the two

(Footnote Continued)

pipelines. LBP-84-31, supra, 20 NRC at 467-70, 474-76. Inasmuch as these findings are unchallenged, no detailed description of these subjects is provided.

178/ Id. at 446-47.

contentions.^{179/} The Board thus assigned no weight to the testimony of FOE's witness.^{180/}

A. The Licensing Board's Challenged
Evidentiary Findings Relating to
The Effect Of Pipeline Ruptures
on the Limerick Station Are Correct
and Should Be Upheld.

In its brief, after a general introduction, FOE addresses a number of the findings of the Licensing Board. A large number of such points consist of only a single sentence or two and fail to give any citation to the record or develop the argument as to how the findings of the Board were incorrect or contributed to error in the ultimate conclusions as contained in the Partial Initial Decision.

Attached to FOE's brief is a June 6, 1984 pleading which purports to be a rebuttal of Applicant's reply findings before the Licensing Board. Initially, a party may not generally incorporate by reference a prior pleading in a brief before the Appeal Board.^{181/} In any event, FOE fails to show how these impermissible reply findings, which are themselves conclusory and undeveloped, were not adequately considered and properly rejected by the Licensing Board.

Pervading FOE's entire argument is the incorrect proposition that if there is any risk whatsoever, no matter how minute, from the operation of nearby pipelines on the Station, "it was the duty of [the

^{179/} Id.

^{180/} Id.

^{181/} Long Island Lighting Company (Shoreham Nuclear Power Station), ALAB-156, 6 AEC 831, 832-33 (1973).

Licensing Board] to eliminate this risk."^{182/} In effect, FOE argues that if anyone can conceive of a combination of postulated events which is calculated to result in an impact on the Station, this is unacceptable under the Atomic Energy Act and the Commission's Rules and Regulations. The proper standard to measure the Board's determination is one of reasonable assurance of the health and safety of the public and not the absolute assurance claimed by FOE.^{183/} Moreover, an applicant must show by the preponderance of the evidence that a contention is not meritorious, and need not show that there is no contrary evidence whatsoever. In response to an assertion that the burden to prove the safety of a component conclusively was not met, the Appeal Board defined an applicant's burden:

The State misconceives the nature of the applicant's evidentiary burden. It was not obliged to meet an absolute standard but to provide "reasonable assurance" that public health, safety and environmental concerns were protected and to demonstrate that assurance "by a preponderance of the evidence." This standard is set by the Administrative Procedure Act which governs Commission adjudicatory hearings (footnotes omitted).^{184/}

^{182/} R.L. Anthony/FOE Brief in Support of Appeal to Appeal Board of 10/23/84 from Second Partial Initial Decision, LBP-84-31, on Contentions V 3a and V 3b (hereinafter "FOE Brief") at 1.

^{183/} See generally, pp. 14-16, supra.

^{184/} Commonwealth Edison Company (Zion Station, Units 1 and 2), ALAB-616, 12 NRC 419, 421 (1980). See also North Anna Environmental Coalition v. NRC, 533 F.2d 655, 667 (1976).

Perhaps it is this misunderstanding which caused FOE in its appeal to attack the integrity and impartiality of the Licensing Board.^{185/}

FOE claims that one of Applicant's witnesses, John Walsh, had "no credentials and training to qualify him to advise PECO on pipelines."^{186/} However, reference to the professional qualifications of John D. Walsh, Science Specialist, Bechtel Group Inc., ff. Tr. 5411, indicates that Mr. Walsh is certainly qualified to present the testimony that he did. He is a professional meteorologist and has pursued graduate studies in matters related to the contentions. Mr. Walsh has had extensive employment as a meteorologist and in the area of atmospheric dispersion, matters which are of specific importance in the consideration of the contentions. He has performed numerous accident analyses for over one dozen nuclear power plants, including the effects of the operation on these stations of nearby industrial, military and transportation facilities. Mr. Walsh's testimony was well-reasoned and well documented. See Testimony of John D. Walsh Relating to Contentions V-3a and V-3b, ff. Tr. 5411, particularly at Attachments 1-3 thereto.

In spite of this, FOE simply concludes that "[b]efore the hearings and during them, a part of Mr. Walsh's testimony was discredited."^{187/} While FOE lists nine items regarding which it states Mr. Walsh was proven wrong, it fails to include a single citation to the record to support its assertion. Thus, this conclusion is essentially worthless.

^{185/} FOE Brief at 1-2.

^{186/} Id. at 2.

^{187/} FOE Brief at 2.

Assuming, arguendo, the correctness of this list, FOE further fails to state how these alleged errors by Mr. Walsh were relied upon and necessary to the decision of the Licensing Board. In any event, even if no reliance were placed upon Mr. Walsh's testimony, the testimony of all the other witnesses of Applicant and Staff more than amply support the Licensing Board's findings.

In any event, several items listed by FOE, as well as a number of the other arguments presented by it in its brief, represent a misapprehension of the responses of Applicant's and Staff's witnesses to questions postulated by it. On numerous occasions, these witnesses responded to hypothetical questions regarding the calculation of resulting blast pressures if a certain set of assumptions postulated by FOE were utilized. While the numerical calculations were made on the record, these calculations do not represent probative evidence, per se. The assumptions must be validated by facts in the record in order to give the calculations evidentiary weight.^{188/} Moreover, certain of the calculations which were performed by Applicant's and Staff's witnesses, including Mr. Walsh, were presented to show the results of bounding assumptions involving scenarios that they did not believe to be credible and must be considered in that context.^{189/} Thus, much of the argument advanced by FOE is fatally flawed.

^{188/} Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units Nos. 1 and 2), ALAB-334, 3 NRC 809, 828-29 (1976).

^{189/} For example, the witnesses were of one mind that the detonation of an unconfirmed natural gas cloud was impossible. Tr. 5294-95, 5336-37, 5350-51; Tr. 5592; Supplemental Testimony of Charles M. (Footnote Continued)

FOE complains in its brief at 2 that the testimony of Mr. Robert L. Anthony should have been admitted into evidence.^{190/} The proffered testimony states that the proposed witness, Mr. Anthony, is a retired art therapist and demonstrated no education, training or experience in the evaluation or analysis of pipeline accidents.^{191/} It states that "[m]y testimony is not submitted as an expert witness." Mr. Anthony claims merely to be the "coordinator" of FOE's position.^{192/}

However, Mr. Anthony's testimony purports to analyze various reports of the National Transportation Safety Board ("NTSB") as to their relationship to accidents which could affect the Limerick Generating Station. FOE has failed to show that this testimony was improperly excluded or were it admitted that it would change the outcome of the Board's consideration of the contentions. FOE's witness, Mr. Bernier Hasbrouk, relied on some of the same reports as contained in the rejected testimony of Mr. Anthony.^{193/} Moreover, the specific incidents outlined in Mr. Anthony's testimony could have been the subject of

(Footnote Continued)

Ferrell, Earl H. Markee, Jr. and Kazimieras M. Campe Concerning FOE Contentions V-3a and V-3b, ff. Tr. 7136, at 13-15; Tr. 7166. While FOE postulates a scenario of "an ignition trigger from gas confined at plant level" (FOE Brief at 4), it gives no substantive support for this hypothesis.

^{190/} Testimony of Robert L. Anthony for Himself and Friends of the Earth on Contentions V 3a and V 3b (served November 14, 1983).

^{191/} Id. at 1.

^{192/} Id.

^{193/} Calculation of Overpressures on Reactor Building from Rupture in ARCO Pipeline Spraying Gasolene (sic) onto the Hillside of Possum Hollow Run, ff. Tr. 5749, at 1.

cross-examination of Applicant's and Staff's panels.^{194/} FOE has shown no error in the Board's action in excluding Mr. Anthony's testimony.

FOE next complains that it had not been permitted to inquire as to whether safety-related structures had been built according to design.^{195/} Clearly, the question of whether the construction of the safety-related structures is in accordance with their design is beyond the scope of the contentions. While FOE implies that the facilities have not been built in accordance with their design, it presented no basis for this assertion. In fact, Applicant's witnesses stated that their analyses were based on drawings which reflect current "as-built" conditions, although technically not considered "as-built" as that term is narrowly defined.^{196/} Furthermore, Applicant neglected certain conservatisms relating to the as-built condition versus the design of the facility. For example, 28-day concrete strength were used in the structural analysis.^{197/} None of the analyses utilized the additional strength of concrete that resulted from years of additional aging since the concrete was 28 days old. The evidence indicated that this increase

^{194/} FOE Exhibits 2 and 3 were NTSB reports used in this manner.

^{195/} FOE Brief at 3, 5.

^{196/} Tr. 8239.

^{197/} Testimony of Philadelphia Electric Company Regarding the Ability of Safety Related Structures to Withstand the Effects of Postulated Detonation Resulting from the Assumed Ruptures of the ARCO and Columbia Gas Transmission Pipelines, ff. Tr. 8213 at 10-11; Tr. 8417-18, 8819-20.

in strength is at least 20% above the values utilized in the Applicant's evaluation and thus represents a significant conservatism.^{198/}

FOE argues that a higher conversion factor of the hydrocarbon vapor to TNT equivalency as initially used by Walsh as a conservatism, is realistic because "there was no conclusion that one was more right than the other."^{199/} Applicant repeatedly stated that it recognized the conservatism in the conversion factor that it utilized and that it represented a significant conservatism in margin calculations. Applicant specifically had testified that the methodology of Reg. Guide 1.91 was the proper basis and that its calculations were conservative and designed to show margin.^{200/} Thus, there is no reason in the record to question the validity of the Reg. Guide 1.91 methodology with regard to calculation of the equivalent TNT explosive capability of the hydrocarbon vapors.

FOE repeatedly accuses the Licensing Board of ignoring the worst case set of assumptions in concluding the contentions had no merit.^{201/} While the analyses of Applicant and Staff were done independently and differently, each was designed to produce a conservative overall result regarding calculation of overpressure, utilizing appropriately conservative assumptions and methodology. Merely because the Staff and Applicant chose different assumptions and methodologies, does not give any

^{198/} Tr. 8818-21.

^{199/} FOE Brief at 3.

^{200/} Tr. 5430-31, 5554. See also, Tr. 6152-55.

^{201/} FOE Brief at 3-5.

evidentiary basis for combining the most conservative assumptions and methodology of each. The Board was not obligated to mechanically accept such a worst case analysis to produce the highest mathematical overpressure. The Commission's rules give the Licensing Board discretion to consider which scenarios it should examine in determining compliance with the regulations, i.e., in determining whether there is undue risk to the health and safety of the public. It was clear that while the Staff's witnesses were doing the numerical calculation suggested by FOE during cross-examination, they did not agree that their calculations were approaching those of FOE's witness Mr. Hasbrouck.^{202/}

FOE states that the Licensing Board ignored Mr. Hasbrouck's maximum 28 psi value for the overpressure produced by a pipeline rupture. That is not true. Upon consideration of the record, the Licensing Board found that Mr. Hasbrouck lacked the expertise to testify on this matter.^{203/} Mr. Hasbrouck admitted that his calculations lacked scientific basis or empirical verification.^{204/} The transcript pages cited by FOE, some of which refer to the testimony of the discredited witness Hasbrouck, simply add nothing. Intervenor has failed to show that Applicant's and Staff's calculations upon which the Board based its decision are unreasonable and that the standard of no undue risk has not been met.

^{202/} See, e.g., Tr. 7508.

^{203/} LBP-84-31, supra, 20 NRC at 467.

^{204/} Id. at 473-74; see also Tr. 5770-88, 5846-57, Tr. 5995, 6002-04.

FOE argues that there could be a greatly enlarged pooling area in Possum Hollow Run if it were postulated that the damming of a PECO road parallel to the railroad embankment would provide a barrier to the flow of gasoline from Possum Hollow Run to the Schuylkill River.^{205/} Staff witness Camp accepted a blockage of the Possum Hollow Run for purposes of analysis. There is no evidence in the record of any credible event which would cause a blockage of the Possum Hollow Run. FOE points to none. During cross-examination, FOE's representative simply asked Staff witnesses to assume that such damming occurred. In response to such questions, the Staff witnesses stated that even were a complete damming to be assumed, that would not increase appreciably the area for evaporation and thus it would not change significantly the amount of vapor potentially in the flammable range.^{206/} FOE has not shown anything incorrect in the assumptions which were approved by the Board in its Partial Initial Decision.

In discussing the scenario for calculating the closest approach of the methane natural gas cloud to the plant as a result of a rupture of the Columbia Gas pipeline, FOE states that diffusion would be impeded under inversion conditions.^{207/} However, the Board has already noted its approval of the Applicant's conservative assumption of an atmospheric stability of Pasquill "F" which is already an inversion

^{205/} FOE Brief at 4. In actuality, the testimony focused on two railroad bridges which span Possum Hollow Run.

^{206/} Tr. 7536-37. The amount of vapor present is directly proportional to the surface area for evaporation.

^{207/} FOE Brief at 4.

condition.^{208/} In this regard, the Board found that atmospheric conditions are more conducive to dispersion 95% of the time. The Applicant also assumed and the Board approved, a one meter per second wind moving the gas cloud directly toward the Limerick Station during Pasquill "F" conditions, a situation that only occurs 0.004% of the time.^{209/}

FOE argues that some of PECO's calculated "margins" of structural integrity are not really margins, being "as little as 3%."^{210/} What FOE apparently fails to comprehend is that the methods of analysis, including the assumptions of the properties of the materials involved, were themselves quite conservative and that being within the Code allowable was sufficient to provide an adequate degree of margin. The code to which the structures were constructed has margin to failure built into it, i.e., even if the code criteria were just met, there would be no incipient failure of the structure. This was amply discussed by the Board.^{211/} FOE brings forth no evidence which was not correctly considered by the Licensing Board.

FOE takes issue with the loadings utilized by the Board resulting from the postulated pipeline explosion. The Board correctly took into account the applicable loadings and explained why they did not have to be combined with other loads suggested by FOE, i.e., they were either

^{208/} LBP-84-31, supra, 20 NRC at 477.

^{209/} Id.

^{210/} FOE Brief at 4.

^{211/} LBP-84-31, supra, 20 NRC at 485-87.

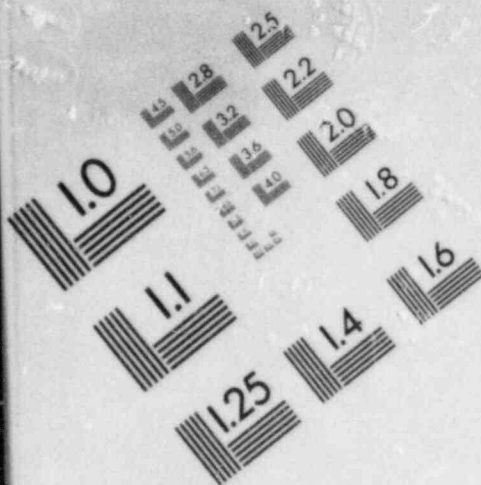
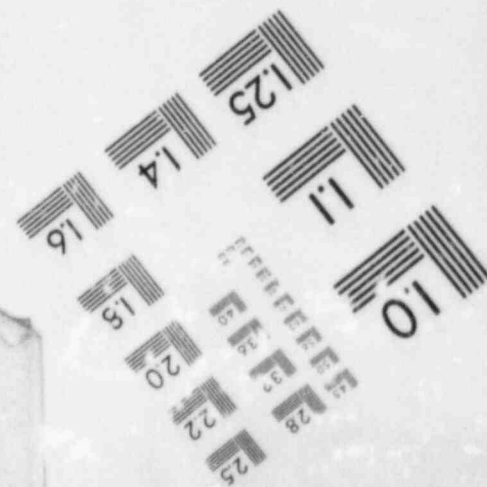
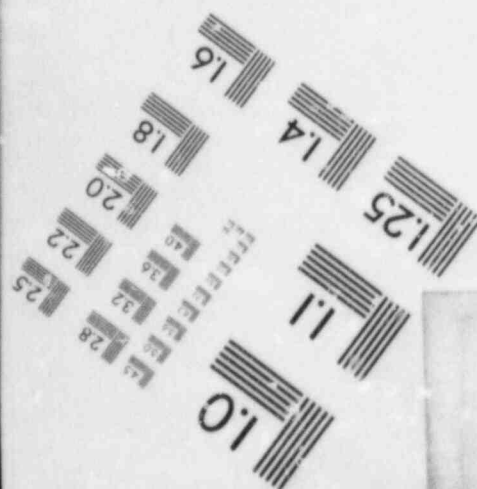
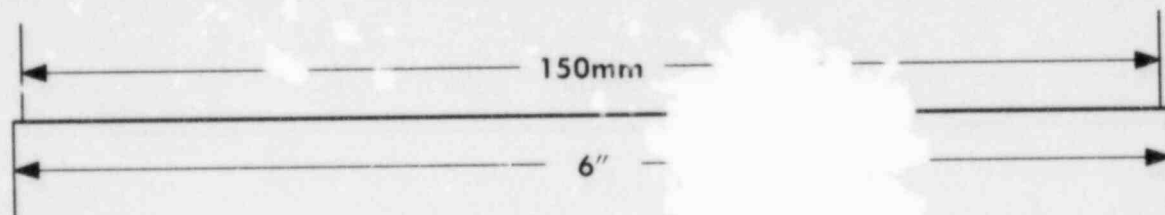
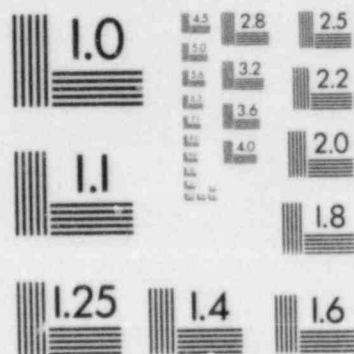
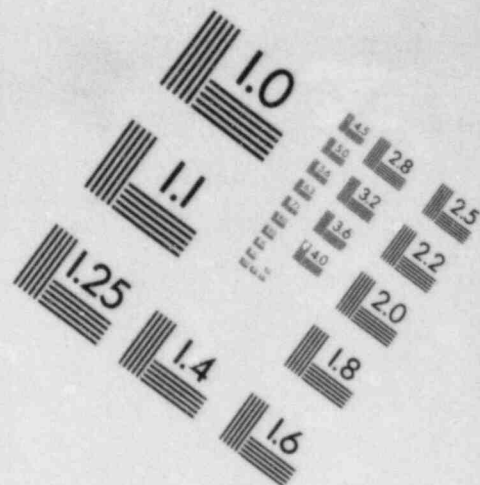


IMAGE EVALUATION
TEST TARGET (MT-3)



negligible or not properly combinable.^{212/} For example, FOE argues that earthquake loadings cannot be compared with those from explosions.^{213/} There is comparability in the fact that resulting stresses in the structure are induced by each of these events and they are comparable if viewed in the same terms. FOE also argues that the Board must consider the failure of louver and roof openings, but fails to state how the Board's extensive consideration of these matters is inadequate.^{214/} The Board did consider the buildup of pressure as a result of a failure of the louvers and found it did not affect the safe shutdown of the facility.^{215/} FOE then takes issue in summary fashion with the remainder of the Board's evaluation but does not state the exact deficiencies it is alleging.^{216/} The Board's disposition of this matter is clearly correct and it should be upheld.

^{212/} LBP-84-31, supra, 20 NRC at 487-89. FOE makes some rather cavalier statements that "[t]here is no evidence that dead weight was calculated as additive to blast pressure on the roofs." (FOE Brief at 5). The Board found that deadloads were properly considered citing the testimony of the witnesses. Id. at 487-88. FOE cites no evidence to the contrary.

^{213/} FOE Brief at 5.

^{214/} Id.

^{215/} LBP-84-31, supra, 20 NRC at 489. FOE has not presented a credible scenario which would result in any significant release of radioactive material resulting from failure of the louvers.

^{216/} For example, it states there "was no conclusive evidence to rule out parts of . . . scenario [involving overturning of cooling towers and transmission towers and breaching of basins], at the least, so they cannot be left out of consideration in worst case conditions." FOE Brief at 5. FOE, however, fails to demonstrate any error in the Board's analysis. Neither does FOE point to any particular fault in the Board's treatment of blast effects on the spray pond. FOE Brief at 5.

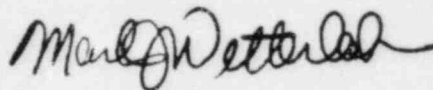
For the foregoing reasons, the Licensing Board's disposition of Contentions V-3a and V-3b, as challenged by FOE, is based upon the record evidence and should be sustained. FOE's appeal should be denied.

Conclusion

For the reasons discussed above, the appeals of LEA, AWPP and FOE are without merit and should be denied.

Respectfully submitted,

CONNER & WETTERHAHN, P.C.

A handwritten signature in dark ink, appearing to read "Mark J. Wetterhahn", with a stylized flourish at the end.

Troy B. Conner, Jr.
Mark J. Wetterhahn
Robert M. Rader

Counsel for the Applicant
Philadelphia Electric Company

December 28, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicant's Brief in Opposition to the Appeals of Limerick Ecology Action, Inc., Air & Water Pollution Patrol, Robert L. Anthony and Friends of the Earth in the Delaware Valley Relating to the Atomic Safety and Licensing Board's Partial Initial Decision of August 29, 1984" dated December 28, 1984 in the captioned matter, have been served upon the following by deposit in the United States mail this 28th day of December, 1984:

Christine N. Kohl, Esq.
Chairman Atomic Safety and
Licensing
Appeal Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Gary J. Edles
Atomic Safety and Licensing
Appeal Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Reginald L. Gotchy
Atomic Safety and Licensing
Appeal Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Helen F. Hoyt, Esq.
Chairperson Atomic Safety
and Licensing
Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Richard F. Cole
Atomic Safety and Licensing
Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Jerry Harbour
Atomic Safety and Licensing
Board U.S. Nuclear
Regulatory
Commission
Washington, D.C. 20555

Atomic Safety and Licensing
Appeal Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Ann P. Hodgdon, Esq.
Counsel for NRC Staff
Office of the Executive
Legal Director
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Philadelphia Electric Company
ATTN: Edward G. Bauer, Jr.
Vice President &
General Counsel
2301 Market Street
Philadelphia, PA 19101

Mr. Frank R. Romano
61 Forest Avenue
Ambler, Pennsylvania 19002

Mr. Robert L. Anthony
Friends of the Earth of
the Delaware Valley
106 Vernon Lane, Box 186
Moylan, Pennsylvania 19065

Miss Phyllis Zitzer
Limerick Ecology Action
P.O. Box 761
762 Queen Street
Pottstown, PA 19464

Charles W. Elliott, Esq.
325 N. 10th Street
Easton, PA 18042

Jay M. Gutierrez, Esq.
U.S. Nuclear Regulatory
Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Angus Love, Esq.
107 East Main Street
Norristown, PA 19401

Robert J. Sugarman, Esq.
Sugarman, Denworth &
Hellegers
16th Floor, Center Plaza
101 N. Broad Street
Philadelphia, PA 19107

Director, Pennsylvania
Emergency Management Agency
Basement, Transportation
and Safety Building
Harrisburg, PA 17120

Martha W. Bush, Esq.
Kathryn S. Lewis, Esq.
City of Philadelphia
Municipal Services Bldg.
15th and JFK Blvd.
Philadelphia, PA 19107

Spence W. Perry, Esq.
Associate General Counsel
Federal Emergency
Management Agency
500 C Street, S.W., Rm. 840
Washington, DC 20472

Thomas Gerusky, Director
Bureau of Radiation
Protection
Department of Environmental
Resources
5th Floor, Fulton Bank Bldg.
Third and Locust Streets
Harrisburg, PA 17120

James Wiggins
Senior Resident Inspector
U.S. Nuclear Regulatory
Commission
P.O. Box 47
Sanatoga, PA 19464

Zori G. Ferkin
Commonwealth of Pennsylvania
Governor's Energy Council
P.O. Box 8010
1625 N. Front Street
Harrisburg, PA 17102

Timothy R.S. Campbell
Director
Department of Emergency
Services
14 East Biddle Street
West Chester, PA 19380

Mr. Ralph Hippert
Pennsylvania Emergency
Management Agency
B151 - Transportation
Safety Building
Harrisburg, PA 17120

Thomas H. Ramsay, Esq.
Law Offices
Elliott D. Goldberg
40 Darby Road
Paoli, PA 19301


Mark S. Wetterhahn