UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	Docket No. 50-382
LOUISIANA POWER & LIGHT CO.	)	
	)	January 26, 1983
(Waterford Steam Electric Station Unit 3)	)	

AFFIDAVIT OF EARL L. DUNCAN
CONCERNING THE EMERGENCY INFORMATION BROCHURE

1. Please describe your educational and professional background.

Answer. My educational and professional background was described in my affidavit previously furnished to the Board.

2. Have you examined the preliminary draft of LP&L's emergency evacuation plan?

Answer. Yes, I have.

3. Would you please give your professional opinion of this brochure?

Answer. This is an apparently fragmented Emergency Evacuation Plan published by LP&L. Final comment must await the completed product. It consists of a "safety information" sheet and a piece of paper labelled "color sketch", which displays a map which does not correspond to the map on the "safety information". It is not clear which map will be printed on the final brochure. The brochure cannot be definitively evaluated until LP&L presents a final product showing which map will be used and what the special needs card will say. Both maps are deficient as presented. The special needs card must be evaluted together with the brochure.

Criticism from Joint Intervenors has resulted in some improvement on the original brochure, but major deficiencies remain.

Personnel in the Army involved in Plans, Operations, and Training are given a small card with the acronym KISS printed on it. KISS is "Keep It Simple Stupid." This brochure violates this principle. After studying the material listed above, I am confused.

The evacuation plan should be pocket sized and be hand-delivered to residents and new arrivals in the area by personnel who are able to explain the hazards of radiation and evacuation procedures. When mailed, the plan will probably end up in the garbage can. Delivery by an individual will give the recipient an opportunity to ask questions and to feel that he is a part of the evacuation plan.

The brochure takes a "Pollyanna Approach" as to who would be affected by a nuclear accident. The ten mile radius is questionable. This failure to "level" with the public concerning the danger of a nuclear accident not only undermines public confidence in the

evacuation plan, but also indicates that LP&L does not regard a nuclear accident as serious business.

The only section of the brochure which educates the public as to why they must evacuate is contained in a small portion of one of the 16 panels of the evacuation plan brochure. The material contained in this panel which would warn the public that a nuclear accident at Waterford 3 will be a danger to them is printed in small single spaced type, the least conspicuous type in the entire brochure. LP&L's Pollyanna approach is shown in the statements that "sometimes you must be careful how much of this radiation enters your body." This statement is misleading to the public and will be recognized as LP&L propaganda by some people. It encourages less knowledgable residents not to take a nuclear accident and evacuation seriously.

The statement that "your house or other buildings can often be a good shelter" from too much radiation leads people to believe that they will probably not need to evacuate. The statement that in an emergency you "may" have to do certain things is not accurate. In an emergency residents "will" have to do something.

These types of statements show that LP&L is more interested in its public relations image than an effective evacuation plan. The public should be informed of the dangers of exposure to radiation by a simple direct statement in conspicuous type - Excessive exposure to radiation can cause injury, cancer, or death. This statement informs the public why they should evacuate.

The inclusion of all four categories of nuclear power plant emergencies is questionable. As the public will not be requires to do anything in an "unusual event", this material does not belong in an evacuation brochure - Remember the KISS principle. It would be preferable to describe emergencies in simpler terms such as red alert - requiring evacuation and yellow alert - stand-by, take precautions, but don't evacuate yet.

The description of the plant and the bold print discussing radiation are irrelevant to the brochure as is the statement that the NRC and the EPA have determined that "you will most likely not have to do anything."

People have a natural reluctance to leave their homes even in an emergency. The brochure's Pollyanna approach to radiation and nuclear power plant accidents will encourage people to belive that they do not need to evacuate. The logistics of evacuation are difficult enough when everyone is cooperative; evacuating a population forcibly is far more difficult and is a different matter.

The "Protective Action Sectors" is limited to the extent that people can follow written instructions; illiterates and persons with limited education will not be able to follow these instructions. Only individualized instructions can determine whether these persons understand the instructions well enough to follow them correctly in any emergency.

The chart for the 16 sections around Waterford 3 is too complicated for the general public, especially those with less than an 8th grade education. These residents and other people who have poor reading ability will not be able to understand where they are supposed to go in an evacuation. Each individual in the evacuation area should be personally furnished a map showing instruction for

to go in an evacuation. Each individual in the evacuation area should be personally furnished a map showing instruction for his zone alone.

It would be preferable to use line route maps for each area with the information in graphics and colors. Persons in the evacuation area should be issued a checklist of what supplies they will need if evacuated from the danger area. A state or parish agency would keep a current and updated list of persons neeeding transportation. Some may not have telephones, requiring individual attention to their evacuation. It is confusing that the brochure suggests that hones not be used, while the evacuation plan requires certain persons to fend for themselves in obtaining transportation out of the danger area.

It is important that persons from the same geographhical areas be evacuated to the same location. The brochure's plan, which apparently calls for school children to be evacuated to a different locations than their parents is not practical. This will cause mass confusion. The brochure fails to state where medical facilities, doctors and nurses, and first aid stations will be located. It makes no reference to the provisions for obtaining prescription drugs. These deficiencies undermine confidence in the evacuation plan and cause people to disregard other information and instructions in the brochure.

In my experience an evacuation plan must speak directly - remember KISS - and to the educational level of all persons executing it. The LP&L brochure ignores these fundamental principles.

In summary, the method of distributing the brochure is faulty and will result in most persons within the evacuation area being unfamiliar with the contents of the brochure and the procedures they, their children, and relatives are expected to follow during an emergency evacuation. A large percentage of those persons who do not immediately discard or misplace the brochure will not be able to understand the brochure or what they are expected to do because the information and instructions contained in the brochure are presented in a confusing manner. Illiterates, non-English speaking people and those with low reading skills will not be able to read the brochure at all. These are serious flaws in any educational materials and instructions. They are inexcusable when they are contained in evacuation instructions. There is no margin for error when the lives and health of so many people depends upon effective communication of information. Any evacuation plan which depends to any substantial degree upon the mailing of this brochure to residents in the evacuation area will result in large numbers of persons not evacuating the area or being injured by exposure to radiation or other means because of the inadequacy of this brochure.

I recommend strongly that a small-scale unannounced trial or practice evacuation be undertaken in an area of the parish where the educational level is lower than average. Following this trial run, the brochure should be amended and rewritten, incorporating lessons learned in the trial evacuation. It is not acceptable procedure to publish an evacuation plan and then not conduct at least a small scale unannounced practice evacuation to determine whether the plan in the evacuation pamphlet will work.

Furthermore, it is not acceptable educational procedure to present an unfinished product as the LP&L pamphlet I have reviewed.

AFFIDAVIT

AIKEN COUNTY
SOUTH CAROLINA

Came and appeared before me, Notary Public, Earl L. Duncan, who, upon being duly sworn, did depose and say:

That the foregoing statements are true and correct to the best of his knowledge.

Earl L Duncan
EARL L. DUNCAN

Sworn to and subscribed
before me, Notary Public,
this 24 day of
January, 1983.

Billie L Hamilt
NOTARY PUBLIC 11-10-86

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EXPLANATION OF EXCEPTIONS ON SYNERGISTIC AND/OR CUMMULATIVE EFFECTS - CONTENTION 8/9

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Appeal Board

In the Matter of	)	
	)	Docket No. 50-382
LOUISIANA POWER & LIGHT CO.	)	
	)	January 26, 1983
(Waterford Steam Electric Station Unit 3)	)	

Dr. G. Kohl
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Enclosed please find the brief in the defense of the Joint Intervenor's exceptions pertaining to Contention 8/9.

Sincerely,

Gary Groesch

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
LOUISIANA POWER AND LIGHT COMPANY
(Waterford Steam Electric Station,
Unit 3)

Docket No. 50-382 OL

Explanation of Exceptions on Synergistic and/or Cumulative Effects

For purposes of discussion of exceptions, this brief is divided into 6 general categories:

(1) Unsupported and false testimony which the Board relied upon.

(2) Failure to consider credible, relevant, and unrefuted expert testimony and/or evidence concerning synergistic and/or cumulative effects of low-level radiation from Waterford 3 and the large amount of carcinogens presently causing Louisiana's high cancer rate.

(3) Improper allocation of the burden of proof and total failure to understand the basic methodology and state of the art of cancer research.

(4) Making Findings of Fact which are false and unsupported by any evidence.

(5) Application of a double standard in evidentiary rulings in favor of LP&L and the NRC.

(6) Failure to address concerns or questions raised by limited appearers concerning the fairness and competence of the ASLB, the NRC, and state and local government.

These categories are delineated by Joint Intervenors in order to facilitate discussion of exceptions. The categories are to some extent overlapping, and many exceptions could be grouped under several categories. Discussion of an exception in the context of one group does not limit the scope of any exception.

(1) UNSUPPORTED AND FALSE TESTIMONY WHICH THE BOARD RELIED UPON

The Board erred in relying upon the testimony of the NRC and LP&L witnesses who have a pecuniary interest in nuclear power and radiation. (E 40, 60, 64, and 65) The Board's findings heavily relied upon professional witnesses whose livlihood is dependent upon the nuclear industry - Branagan, Mauro, Kenning, Hamilton, and Goldman. Mauro is employed by EBASCO, a contractor at Waterford 3 and has worked at 10 different nuclear plants. (E 60, Tr 488, 503) The methodology used by Mauro in determining emissions is inherently suspect because it is an in-house industry code of an industry which is notorious for cover-ups. (E 61, Tr. 491, FF 99-102) Mauro's calculations are substantially incorrect because he conducted no studies of radiation in the Mississippi River. As the most dangerous pathway for radioactive effluents is ingestion via food or drinking water, this ommission is extremely serious. (Tr. 1836, Q. 13, 19) Mauro is not qualified to determine what emissions should be measured, the adequacy of the Gale Code, and the health effects of emissions from Waterford 3. (E 60-63) Mauro never previously testified at an operating license hearing and more importantly has never confirmed emissions at any operating plant. (Tr 511, E 62) Mauro is incapable of testifying on the effects of estimated emissions from Waterford 3 because he has never taken a biology course, did not include chemical exposures in estimates of health effects, took no account of Louisiana's existing high cancer rate (Tr. 530), and his calculations for radiation intake for maximally exposed infants do not include eating radioactive vegetables from vegetable gardens near Waterford 3. (Tr. 521) Thus, the Board's findings concerning emissions and health effects therefrom rest upon the shakey foundation of a nuclear contractor's employee who has never taken

a biology course, and has no expertise in infant nutritional habits in St. Charles Parish or vegetable gardens in St. Charles Parish.

Kenning is employed by LP&L. (E 40) No predicate was laid for his testimony regarding readings of background radiation or of the qualifications of technicians making such readings, and none of the readings made by unnamed technicians was verified by Kenning. (Tr. 472, E 59)

The Board Findings of Fact 107-111 regarding synergistic and/or cumulative interaction of radioactive emissions from Waterford 3 and carcinogens already present in South Louisiana depended almost entirely on the testimony of Hamilton, Goldman, and Fabrikant, all of whom have a vested interest in nuclear power. (Tr. 461, Q. 13-14, Tr. 735, Q. 10-15, Tr. 942-945, Tr. 987, Tr. 3656-3657) These men are members of the incestuous radiation protection community that Dr. Hutchinson, an LP&L witness, stated has in every instance of radiation health risk studies revised the risks downward. Hamilton's employer received 66% of its fund from the Department of Energy, which has been charged with promoting nuclear power after the AEC was abolished because of its gross abuses, (i.e., conducting atomic bomb tests on helpless veterans and lying to a federal judge in Utah concerning atomic bomb tests). (E 40, 64) Hamilton has appeared as a paid witness at numerous licensing hearing always on behalf of nuclear utilities. (E 64) Hamilton has never been asked to testify by the NRC, any ASLB, or any Congressional Committee. (Tr. 540) Although he claimed to have written a number of articles, the authoritative Index Medicus reveals none by Hamilton and there is no evidence that any of Hamilton's articles have ever passed peer review, which other LP&L witnesses alleged was a non-political process which supposedly conducts scientific review of studies and articles. (E 64) Moreover, Hamilton displayed selective amnesia in attempting to cover up the extent of his involvement with the nuclear industry. (E 64, 65, Tr. 537-544)

Goldman has testified on behalf of utilities and the NRC at various hearings. (See C.A. No. 78-3371, M.O. Tenn. - Oct. 2, 1978)

The Board's reliance on Hamilton's testimony concerning the amount of radiation which will be emitted by Waterford 3 and exposed by residents is entirely misplaced. (E 66, Tr. 715-717) Dr. Hamilton makes repeated references in this Direct Testimony to the estimated amount of additional radiation from Waterford 3 as "smaller even than the existing variations in natural background radiation" (Tr. 461) and as "being a tiny fraction of the doses the population already receives annually from natural background radiation" (Tr. 461) and again as "the tiny incremental addition of low-level doses of radiation." (Tr. 461) He apparently does not know the exact figures to which he refers as "tiny" and nowhere in his testimony offers a specific amount in rems or percentage of background radiation. Nevertheless, his defense of Waterford 3 hinges on the assumptions quoted above which are at serious variance with Dr. Branagan's estimation that certain individuals can be exposed to 23 millirems annually or 27% above the natural background radiation level, hardly a "tiny fraction." The vagueness of Dr. Hamilton's assumptions and the fact that they contradict Dr. Branagan's explicit statements call the validity of his argument and even his familiarity with Waterford 3 into such serious question as to make his testimony unreliable. (E 66)

Moreover, Hamilton used inaccurate LP&L estimates as the basis for his statements concerning the amount and health effects from Waterford 3's radiation. (Tr. 637, 639)

The Board erred in permitting Hamilton to testify concerning the risk to the Louisiana public from drinking water and to critique Dr. Gottlieb's studies concerning carcinogens in Louisiana (Tr. 652-672, E 67, 68) although he knows almost nothing about carcinogens and Louisiana's cancer corridor. (Tr. 648, 672, 673, 676, E 67, 68)

The Board's reliance on Hamilton concerning the upper limits of synergism is fundamentally dishonest. (FF 107-109, E 40, 69) Hamilton is not an epidemiologist (Tr. 703), has never conducted research on synergism (Tr. 687), does not perform research or study animals, people, or cells (Tr. 689-690), and has never collected data on his own or made analyses of at-risk populations regarding low-level radiation. (Tr. 700-703, E 40, 69) In short, Hamilton is a bureaucrat who supplements his salary by testifying for nuclear utilities.

Dr. Hamilton demonstrated his lack of familiarity with synergism and was unable to offer any support for his naked opinion that the B.E.I.R. I report's linear hypothesis for radiation alone establishes limits for synergism between radiation and chemical carcinogens. (E 69)

Dr. Hamilton makes three basic assumptions which are in no way supported and which the Board questions as sufficient scientific support for Applicant's position. The first assumption is that the linear-linear dose-effect curve derived from scientific observation of responses to <u>radiation alone</u> will automatically reflect multiplicative effects in response to radiation-plus-chemicals. There is no evidence for this assumption whatsoever, as pointed out in the exchange between Judge Foremand and Dr. Hamilton (Tr. p. 717 top) It is reasonable to assume that synergistic effects observed at relatively high levels of exposure will continue to occur at lower levels. However, it is <u>not</u> reasonable to assume that effects which are multiplicative in nature and which are dependent upon doses of two or more agents (as well as time intervals between administration of the agents in some experiments cited) will be simply linear over a range of radiation doses. Despite evidence in the medical literature that synergism is optimized at certain doses of radiation and even disappears at higher or lower doses, Dr. Hamilton's

second unsupported assumption is that " I would expect the results of addition to be directly proportional to the additional dose of radiation." (Tr. p. 717, lines 18,19) And further bases on his assertion "the dose we're talking about is zero, less than 0.01 millirem a year" (p. 716) Dr. Hamilton concludes that the synergistic effects "proportional" (calculated presumably using some constant factor, as yet unknown) to such a small additional dose above background radiation will be negligibly small. However, if the Board applies Dr. Hamilton's assumption to Dr. Branagan's calculated total annual radiation dose to the maximally exposed individual of 23 millirems, or 27% of the background radiation dose (Tr. p. 880, lines 15-20), the resulting anticipated health effect of 27% more cancer deaths is absolutely unacceptable, and, it is hoped, unreliable and inaccurate. The third unsupported basic assumption upon which Applicant's presumed compliance with Contention 8/9 hinges is that "the ability to place an upper bound on the effect" (Applicant's Opinion, p. 24) is bestowed by the linear-linear dose-effect curve developed in the B.E.I.R. I Report for radiation doses alone. However, even the B.E.I.R. Committee makes no assertion that the linear curve represents an upper limit of risk, but frankly states that "because there is greater killing of susceptible cells at high doses and high dose rates, extrapolation based on effects observed under these exposure conditions may be postulated to <u>underestimate</u> the risks of irradiation at low doses and dose rates." (B.E.I.R. I, Chap. VIII, Sec. IV) The B.E.I.R. 1 Report goes on to define the linear hypothesis as "the only workable approach to numerical risk estimation ... since there is no means at present of determining the value of the dose-effect slope in the low-dose region" (same as above, Sec. VI) and to emphasize the "it is clear that these

estimates are subject to great uncertainty." (B.E.I.R. I, Chap. V, Sec. I) These statements clearly contradict Dr. Hamilton's declaration, "But as we use only the linear-linear relationship - and as I know that exaggerates or gives an upper limit to risk, I feel confident..." (Tr., p. 719, lines 14-16) Nowhere in his testimony does Dr. Hamilton, or Dr. Hutchinson, who was a member of the B.E.I.R. Committee, offer evidence or support for this upper limit definition within the linear hypothesis, or even make reference to it. Furthermore, it is not common practice, nor is it logical to draw a straight line through mean points defined by two axes, where the actual points occur both above and below the line, and then to conclude that the line represents an upper limit in areas where there are no points. Dr. Hamilton's basic assumptions simply assume too much to provide meaningful evidence that synergistic and/or cumulative effects are properly evaluated by Applicant.

Dr. Goldman, whom the Board also relied upon heavily in FF 107-111, showed that he was unable to correctly interpret scientific reports and attempted to minimize the effects of synergism which he himself admitted (Tr. 735, References 7-12, See Joint Intervenor FF 45-46) misrepresenting under oath the results of a crucial scientific study. (Tr. 735, p. 10, E 39, 41)

Dr. Goldman's credibility and his ability to interpret scientific reports are severely compromised by his gross misrepresentation of the A.R. Kennedy, et. al., (Tr. 735) studies. At Tr. 735, p. 10, Dr. Goldman attempts to minimize the magnitude of the observed enhancement: "However, under the most ideal of conditions, using relatively high radiation doses (20 mrem or more) the maximum enhancement was a factor of about eight or nine. (Tr. 735, p. 10) Nowhere in the Kennedy report are the factors "eight or nine" mentioned. The report actually states (on p. 440): "X-irradiation

(100 rads) with subsequent TPA treatment resulted in a transformation frequency of about 1.4 ± 0.1 (S.E.) X 10^{-3} (average of Groups 3 to 5 in Table L), a 19-fold enhancement in transformation over 100 rads alone ... TPA worked most effectively in enhancing X-ray transformation at doses of radiation that yielded very low levels of transformation by themselves." When confronted with this serious descrepancy under cross-examination, Dr. Goldman was unable to explain his interpretation of the Kennedy data, nor did he indicate that an error was made in his original testimony offered under oath. (Tr., p. 946, line 19 through 99, line 18) Further evidence of Dr. Goldman's incompetence in interpreting and drawing conclusions from the scientific literature - even those he relies on in his testimony - lie in his discussion of the DiPaolo studies, one of which he cites as Reference 8 (as "DiPaolo, J.A."). He mistakenly focuses on the quantity of enhancement or the size of the enhancement factor as the significant point in DiPaolo's work. The real relevance of these experiments to low-level radiation-mediated synergism is that a non-transforming dose level of radiation enhances "transformation ordinarily associated with the chemical" and that "the lack of transformation with irradiation alone argues against the selection of a special radiation-sensitive cell." (Tr. 735, Goldman's Reference 8, Abstract) Despite this and the introductory statement in this paper, "Under the conditions of these experiments, no transformation was identified as a result of the X-irradiation only," Dr. Goldman insists under cross-examination that "little in the way of transformation" occurred with radiation alone. (Tr., p. 970) Any astute expert cannot miss the consistent feature of DiPaolo's often described experimental model: the radiation dose level when used alone, thus presenting a valid model for low dose or other

sub-effective dose situations. Dr. Goldman's inexplicable misrepresentation of the Kennedy studies and his failure to note the conspicuous feature of the DiPaolo model - both being references with which he claims familiarity - makes it impossible for the Board to accept his interpretations of and conclusions from his reading of the literature on the topic of synergism. (E 39, 41, 84)

(2) FAILURE TO CONSIDER CREDIBLE, RELEVANT, AND UNREFUTED EXPERT TESTIMONY AND/OR EVIDENCE CONCERNING SYNERGISTIC AND/OR CUMULATIVE EFFECTS OF LOW-LEVEL RADIATION FROM WATERFORD 3 AND THE LARGE AMOUNT OF CARCINOGENS PRESENTLY CAUSING LOUISIANA'S HIGH CANCER RATE (E 70-85)

The Board's treatment of testimony and evidence concerning the burden of carcinogens in Louisiana and its relationship to Louisiana's high cancer rate in FF 103-105 is a radical distortion of the unrefuted and expert testimony presented to the Board concerning Louisiana's high cancer burden. (E 40, 70, 73) The Board failed to consider the unrebutted expert testimony of Dr. Velma Campbell, a practicing Louisiana physician, who related Louisiana's high cancer rate to the large number and amount of carcinogens in the Lousisana environment. Dr. Campbell's expert opinion regarding the inadvisability of adding yet another carcinogen - radiation, to Louisiana's burdened environment is supported by the Sworn Statement of Dr. Samuel Epstein, admitted as Limited Appearance Testimony and admissable under 10 C. F.R. Part 2, App. A, V, (d) (1).

The Board's attempt in FF 103-105 to dismiss the huge volume of evidentiary material presented to it concerning Louisiana's tragic cancer burden and its causes, by discussing only 3 articles in FF 103-105, indicates

the public distrust of the ASLB and the NRC expressed by numerous limited appearers is well-founded.

The Harris report (see Appendix II), submitted to New Orleans councilmen in November 1974, clearly stated that persistent carcinogens (cancer-causing substances) are discharged into the Mississippi River, from the industries that border the river, and also from municipal discharges, accidental spills, and run-off from agricultural and urban areas.

From a 1972 study (see Appendix III), forty-eight (48) organic compounds were identified in raw or treated water supplies at Carville, New Orleans (Carrollton Water Treatment Plant), and Marrero, Louisiana. Included were chloroform, hexachlorobenzene, zylene, ethyl benzene, dimethylsulfoxide, benzene, carbon tetrachloride, and chloromethyl ether. Although some of these chemicals are relatively low levels of exposure, preliminary epidemiologic studies of aggregate populations in Louisiana, Ohio, and New Jersey support the hypothesis that carcinogens in drinking water are related to human cancer. (See also Sworn Statement of Dr. S.S. Epstein, Ques. 13 and 14, submitted as limited appearance)

Dr. Velma Campbell, in sworn testimony, (Tr. 1055, Ques. 9) cited data taken from the SEER Program (National Cancer Institute), that is, "Cancer Incidence and Mortality in the United States, 1973-77," show high mortality rates for the New Orleans area, compared to the rest of the nation:

(a) Incidence rates (i.e., new cases of a disease in a population over a period of time), show that the average annual age-adjusted incidence rates in the New Orleans area for the respiratory system (including lung) is 71.1/100,000, while nation-wide it is 52.6/100,000 - the highest in the nation. Females had an incidence rate for respiratory

cancer of 30.0/100,000 compared to 24.4/100,000 for the United States. For bladder cancer the incidence rate for males is 27.7/100,000 compared to 25.8/100,000 for the United States. Incidence rates for blacks showed the highest rates in New Orleans for buccal cavity and pharynx (16.3/100,000), the digestive system (95.6/100,000), and the respiratory system (30.1/100,000) than other areas in the study. Black males had the highest rates for stomach cancer (29.0/100,000), and also black females for stomach cancer 13.3/100,000).

(b) Cancer mortality rates (i.e., the number of persons in a given population who die of given cause) also are very high in the New Orleans area compared to the rest of the nation; the SEER Report shows these results for average annual age-adjusted mortality rates:
For all races, both sexes, New Orleans had the highest rate for all cancer sites combined (201.1/100,000), compared to the United States (166.5/100,000). Also, New Orleans had the highest rate for the respiratory system (50.8/100,000) compared to 39.7/100,000 nationwide; the highest for breast cancer (16.7/100,000) compared to 15.1/100,000 in the United States, and the highest in the urinary system (8.6/100,000) compared to 7.5/100,000 for the United States. New Orleans tied for highest with Connecticut for rectal cancer (5.4/100,000). Males are highest in the New Orleans area for respiratory cancer at 94.0/100,000 and second only to Connecticut for colon cancer at 23.3/100,000. Males are also highest in the U.S. for liver cancer at 4.5/100,000. Average annual age-adjusted mortality rates for females, all races, also show the highest rates for all sites combined (152.3/100,000), compared to the other United States areas in the report. Females are second highest

(to San Francisco) in pancreatic cancer, second highest (to San Francisco) in lung cancer, and second highest in rectal cancer, next to Connecticut. For Whites overall, both sexes, the New Orleans area is the highest in bladder cancer (5.3/100,000) and in lung cancer (46.1/100,000), and second highest in colon (19.5/100,000) and in rectal cancer (4.9.100,000). Blacks, overall, both sexes, are highest in the New Orleans area in all sites combined (243.9.100,000), in stomach cancer (15.4/100,000), in rectal cancer (6.9/100,000), and in respiratory cancer (58.5.100,000) than the rest of the United States.

Several cancer studies have been published with regard to the southeastern Louisiana area, including the New Orleans metropolitan area, and also parishes bordering the Mississippi River. A study done on lung cancer in Louisiana through death certificate analysis (Gottlieb, Pickle, et.al., JNCI, November 1979) revealed approximately a two-fold excess risk of lung cancer associated with certain types of industries. Lung cancer risk was also found among older men who had been employed in the petroleum industry and among male and female residents of towns where the petroleum industry was a major employer. In a study on pancreatic cancer mortality in Louisiana (Pickle, Gottlieb, AJPH, March 1980), high pancreatic cancer mortality among white males in a cluster of Louisiana parishes was investigated. Excess risk was seen for workers in the oil refining and paper manufacturing industries, and for residents living near refineries. The latest Louisiana study, "Cancer and Drinking Water in Louisiana: Colon and Rectum" was published this year (Gottlieb, Carr, Morris, IJ of E, 1981). This study found a significant risk for rectal cancer associated with drinking water derived from the Mississippi River. A multi-dimensional contingency table

analysis found the association between rectal cancer and surface water (Mississippi River water used for drinking water) significant at the 0.0001 level and not dependent on age, race, sex, and diet. Chlorination also associated significantly with rectal cancer. Among those who used river water, the risk increased inversely as the distance from the mouth, with greater risk downstream from the many industries which line the river.

Dr. Velma Campbell in sworn testimony before the Atomic Safety and Licensing Board, did state, (Tr. 1055, Q. 9), that along the Mississippi River corridor between Baton Rouge and New Orleans, Louisiana, there is a larger burden of chemical exposures through air, drinking water, and occupation than in many other areas of the country. She also stated that rates of cancer for people who live along the lower Mississippi River in Southeast Louisiana are significantly higher than the national average, especially for respiratory, urinary tract, and pancreatic cancers, and that epidemiologic studies have linked these high cancer rates to such exposures as use of the Mississippi River for drinking water, employment in shipbuilding and chemical industries, and residence near petroleum refineries Dr. Campbell stated (in the same answer) that the people of this area (i.e., along the Mississippi River "corridor") face a potentially serious public health problem; that they are exposed to a vast array of chemicals from a variety of sources and that they also suffer a burden of cancer incidence greater than the national average, which is demonstrably related to those environmental exposures.

Dr. Campbell, in her sworn testimony, Q. 8, defined synergism as "the capacity of two (or more) substances when combined to cause more effect than either would cause acting alone." Dr. Samuel S. Epstein, who has published several papers dealing with synergism, gives a similar definition

in his Sworn Statement (Q.8,12) submitted as a limited appearance. The Board may consider the statement of Dr. Epstein persuant to 10 C.F.R. Part 2, App. A, V, (b)(4).

Dr. Campbell stated in (Tr. 1055, Q. 9) that chemicals, radiation, and other agents, when found together in the general environment, may behave in ways not predictable by laboratory experiments in which these agents are isolated from each other. She stated that certain chemicals, particularly halogenated hydrocarbons, accumulate in animal and human tissues over time, prolonging and increasing the exposure of body tissues to the offending chemicals, thus increasing the possibility of ill effects, including cancer. Then Dr. Campbell stated (Q. 9) that it is now proposed to add another increment of risk to the already higher than average burden (of cancer incidence). She cited references from the medical literature that include significant research which supports the premise that small doses of radiation increase the development of cancer from exposure to some chemicals. She stated that the logical conclusion is that, to knowingly add radiation, even at low levels, to the chemical exposures confronting the presumably limited capacity of the human immune system is to greatly increase the risk of cancer for each individual who lives in the area, and (Q. 12) that small children (less than seven years old) and older people (sixty years and older) are particularly vulnerable to this type of risk. This statement is supported by that of Dr. S.S. Epstein (Q. 9, 19-21) submitted as limited appearance testimony.

In short, the Board, in its FF 103-105, arbitrarily ignored the best available state of the art unrefuted evidence concerning Louisiana's high cancer burden and its causes. (E 40, 70, 73)

Similarly, the Board has failed to consider the expert unrebutted testimony of Dr. Carl Johnson concerning the untrustworthiness of the NRC staff and applicant and staff's methodology in determining emissions from Waterford 3 and the health burden created thereby. (E 40, 70, 75, 85) Dr. Johnson's testimony demonstrates that the Board's finding of a "very small" impact in FF 102 is erroneous. Dr. Johnson's testimony demonstrates that the greatest health hazard will come from the ingestion of radioactive materials which will be released from Waterford 3.

In (Tr. 1836, Q. 13) Dr. Johnson said that exposure to external radiation will be the least important consideration. He stated that inhalation and ingestion of radioactive gases, vapors, and particulates in the air, in the water, or built up in the food chain, i.e., milk, meat, other produce, and grains, will be the most important source of exposure to the plant, and these sources of exposure have been very poorly evaluated.

Dr. Johnson, (Tr. 1836, Q. 19) when asked about the special risks associated with ground water radionucleide contamination, given the special geographic circumstances of Louisiana, stated that there are special risks associated in ground water contamination with radionucleides, because of the high water table in Louisiana. He also states (Q. 20) that we could expect to see a synergistic effect in Louisiana, where people may be exposed to high levels of chemical contamination in the water, along with normal exposure to radionucleides from nuclear plants in the air, water, or food. Dr. Johnson stated (Tr. 1836, Q. 22) that he thinks that the introduction of additional radiation in South Louisiana resulting from plant operations is unacceptable. Further, he doubts very much that actual exposures will be as small as this, especially considering the biological effects of the 240 radionucleides of importance released by nuclear power

plants such as that proposed (see also pp. 1868, 1943 of Docket No. 50-382). Dr. Johnson stated that many of these radionucleides are isotopes of trace elements and other elements important in nutrition; that they will be concentrated and stored in the body in places where they can do much harm. He said that no one has really done an adequate study of the molecular, cellular, and developmental effects of these 240 radionucleides; that no one really knows what the long-term effects of these radionucleides on the reproduction of man, animals, and plants will be.

The Board failed to consider in FF 99, 102 the danger to high risk segments of the population presented by radiation from Waterford 3 pointed out by Dr. Johnson (E 40, 70, 75)

In (Tr. 1836, Q. 15) Dr. Johnson said that, in regard to special segments of the population more likely to demonstrate health effects from living in proximity to a nuclear installation, the fetus is considered about twenty times more sensitive to radiation than the adult, a child about ten times more sensitive to radiation than the adult, and in addition, people with defects in their immune systems are considered to be much more prone to injuries from radiation.

The Board erred in ignoring Dr. Johnson's unrefuted testimony that emissions levels from Waterford 3 are unreliable because of the NRC's notorious industry bias (Tr. 1836, p. 10) and previous experience has shown that emissions levels from other nuclear power plants are higher than estimated emissions from Waterford 3. (E 40, 70, 75)

Dr. Johnson stated (Cross-Examination, pp. 1902, 1903, 1907, April 1, 1982) that he has seen records of very large releases of radioactive gases and radionucleides in exhaust plumes and liquid emissions

from operating nuclear power plants, that releases of five reactors were reported in papers sent to him by the NRC, and in EPA reports. These published releases are considerably higher than the proposed releases of the Waterford 3 plant.

Dr. Johnson testified that he believed that the effects of radiation are cumulative, that he believed that the combined effects of low levels of radiation from a nuclear power plant and chemical carcinogens would be synergistic, and that it was his expert opinion that synergism between high levels of radiation and chemicals could fairly be extrapolated down. (Tr. 1836, Q. 11, 13, Tr. 2025)

The technical expert testimony of Dr. Bross is entirely unrebutted by any other testimony or materials introduced into evidence. Yet the Board's findings on cummulative and/or synergistic health effects make no mention whatsoever of the uncontroverted Bross evidence. (FF 102,107). In fact,all of the Board's findings on "The Multiplicative Hazard" (with the exception of a definition of synergism) are based entirely on evidence proffered by Applicant and Staff, completely ignoring Joint Intervenors' exhibits and witnesses. (E76-85). This exclusion of expert testimony for no reason and the arbitrary decision to exclude as evidence pertinent medical reports simply because the authors themselves were not present seems to confirm Dr. Bross' and Dr. Johnson's observations concerning the NRC's pro-utility bias. (E85). Their views are shared by those interviewed in the May 7,1982, issue of Science article, Appendix VI and VII to Joint Intervenors' proposed finding 49.

The Board is mistaken in finding that the health "impact would be very small" (FF102) because the "commonly accepted methodology and risk function" (FF102) on which the Board relies do not take into account the effects of genetic degradation in a population over successive generations. (E76). The mechanism by which certain chemicals and radiation independently create break-points in the genetic material is described by Dr. Bross (TR 1342 Ques. 20,43-46; Joint Intervenors' Exhibits 22,26) and in the medical literature (Hearing Brief, Appendix IV). Two serious effects

of low level radiation acting upon a population through this mechanism are (1) random genetic damage resulting in a broad range of deviations from normal and (2) the burden of genetic damage increasing with each generation's inheritance of accumulated break-points. (E79). The Board's error consists of assessing risks in the isolated circumstance of annual dose effects only (which are assumed to be 100% erased annually) and by limiting the definition of "effects" to cancer and leukemia. The methodology and risk functions on which the Board relies are too narrow to meaningfully evaluate long-term health effects from low level radiation acting alone or acting synergistically with certain chemical which also alter genetic material. So the effects are cummulative over generations as well as among mutagenic agents. (E76,79). (TR 1342 Ques. 35-37). Furthermore, the Board overlooks the known increased sensitivity of fetuses, infants and children to synergistic and/or cumulative effects from radiation and chemicals (FF102) when it fails to weigh Applicant's findings against those of Bross, Wilson, Upton, Stannard and others who estimate fetal vulnerability to be 5 to 10 times greater than adult risk. (E78,83). These observations are discussed more fully in Joint Intervenors' proposed finding 23.

The Board dismisses many research reports because radiation doses cited are much higher than NRC design objectives. (FF 102,107,108) (E77). But this is an error because it is well known to the Board that Allen Brodsky in the NRC's own Office of Standards

Development as early as 1978 had presented a "stochastic two-sequential stage model that could account for the sometimes greater carcinogenic respones observed for the same dose given at lower dose rates (within a certain range) - both for radiation as well as chemical carcinogens. Lower dose-rates and extended durations of irradiation, would particularly be more effective in situations where radiation was acting primarily as a promoter in the presence of active chemical initiators in the environment." See Joint Intervenors' Proposed findings, Appendix V. (E77,85)(10CFR2.743 (h),(i)).

The Board offers no explanation for rejecting epidemiological observations made in the USSR and in the Love Canal populations which are subject to synergistic and/or cummulative health risk due to exposure to low level radiation simultaneously with significant industrial chemical pollution. (E80,81). An explanation would seem to be in order since these epidemiological circumstances exactly parallel those of south Louisiana once Waterfod 3 begins operation and since evidence to this effect was unrebutted and since the Board reportedly sought evidence precisely on point (FF 107,108,109)(TR 1342 Ques. 29-34,37)(Dept. of Commerce 1980 publication "Rising Infant Mortality in the USSR in the 1970's", Davis and Feshbach). Epidemiological observations of increased infant mortality and childhood disease represent the early effects of genetic damage in a population, and indicate exposure to

mutagenic agents. In the Russian and Love Canal populations it was noted by Dr. Bross and Dr. Pandit that though the exposures to chemicals were within tolerable limits and exposures to radiation were also within limits presumed to be safe, infant mortality and other disease rates far exceed risk estimates for either chemical or radiation hazards. Thus, these excessive infant mortality and other disease rates are interpreted as synergistic health effects. No alternate interpretation is presented to the Board and yet the Board fails to apply the best epidemiological evidence available to its decision (E 80,81,82)(FF 107-111).

Unfortunately, this failure of the regulatory agencies to correctly interpret and apply epidemiological evidence of the elevated health risk is not unprecedented in south Louisiana. The Board noted the results of this failure to properly regulate chemical carcinogens in this area without acknowledging that this situation sets the stage for synergistic enhancement by radiation from Waterford 3. (E 82,85)(FF 102-105,110,111). It is not necessary for a competent regulatory body to quantify or even identify all of the mutagens and carcinogens in an environment to be able to declare their presence because epidemiological evidence in the form of excessively high cancer death rates confirms the presence of concentrated carcinogens. (E 82)(FF 103-105). Where there is smoke, there's fire.

The Board's failure to consider Dr. Bross's unrebutted

expert testimony on regulatory policy errors in Russia constitutes a willful repetition of those mistakes in south Louisiana and condemns this population to serve as guinea pigs in an experiment whose outcome can well be anticipated.(TR 1366-68, 1342 Ques.51)

The manner in which averages are calculated insures that some individuals are exposed to more radiation then the average dose and some to less. And it is those who recieve the above-average-dose who are of concern to regulatory agencies. Concentration of radiation in the food chain increases the average exposure. Increased susceptibility to radiation damage in certain members of the population tends to yeild more health effects than expected from an average radiation dose. Children constitute a significant subgroup exhibiting increased susceptibility to radiation and yet this factor is not figured into risk estimates for the average radiation dose (TR 1372-75,1342 Ques. 40)(E83)(FF99).

(3) IMPROPER ALLOCATION OF THE BURDEN OF PROOF AND FAILURE TO COMPREHEND THE BASIC SCIENTIFIC METHODOLOGY USED IN CANCER RESEARCH

The Board erred in consistently placing the burden of proof on Joint Intervenors rather than upon Applicant. This approach results in an "innocent until proven guilty" orientation toward Applicant - a position inconsistant with the principals of conscientious regulation of hazardous materials and with NRC regulations. (E 46, 47, 48, FF, 107, 108)

Joint Intervenors witnesses, taken as a panel present a prima facea case for synergistic and/or cumulative radiation effects; Applicant must then carry the burden of disproving this prima facea case according to NRC regulations 10 CFR Part 2, App. A, V, (d)(1) and 10 CFR 2.732.

The Board errs in demanding mathematical proof from cancer research, when it is self-evident that if so much were positively known about cancer oncology and epidemiology then cancer would not be the unmanageable medical condition it still is. The sole reason "no synergistic effects between radiation at the very low dose levels to be released from Waterford 3 and

chemical carcinogens have never been demonstrated" (FF 107) is that they have never been tested. The long time periods involved in human cancer onset; the detailed case histories which would have to be maintained on thousands of individuals, the variability of exposures in the human environment, and the prohibitive expense (Tr. 2025, 988): these are major obstacles to direct observation of cause and effect at long-term low-dose exposures to radiation and chemicals. And it unlikely that such direct evidence of low-level synergistic and/or cumulative health effects in human populations will be forthcoming in the near future. Nevertheless, Joint Intervenors present cellular and animal research in which higher doses accelerate cell transformation, thus demonstrating synergistic and/or cumulative effects within the relatively brief time periods practicable in laboratories where animal lifespans are a limiting factor. Despite the Board's objection that radiation dosages employed in the studies offered as evidence for exceed dosages anticipated from Waterford 3 (FF 107) these studies remain appropriate and relevant research models because it is the effect of dosage and the synergistic and/or cumulative enhancement of that effect which determines a model's applicability, not the absolute dosage itself. (E 46, 47) (This line of reasoning is more fully explicated in Joint Intervenors FF 22, 25, 39, 45, 46, and 47)

Moreover, Joint Intervenors present the only epidemiological reports available to medical science demonstrating effects of low-level long-term exposures to chemicals and/or radiation (Tr. 1342, Q. 23, 29-42; Tr. 1836, Q. 14, and Dr. Pandit's direct testimony Q. 15).

Therefore, in order to make a discussion based on the best available research, the Board has no choice but to draw his conclusions from the relatively higher dosage and shorter timed animal/cellular experiments

because those studies represent the state of the art in cancer research on cumulative and/or synergistic health effects. (E 47, 48, 49)

The Board's refusal to consider the best available research on the grounds that it does not represent a mathematical certainty is unreasonable; only synergism research on human guinea pigs sealed in a controlled environment for a lifetime would seem to satisfy the Board's requirement for relevance. (E 47) Indeed, application of this Board's standard for medical evidence of cause and effect would admit of no relationship between cigarette smoking and lung cancer.

The conservative approach to public health hazards always assumes that demonstrated risks at high doseages exist to some extent also at lower doseages. The U.S. Food and Drug Administration routinely applies this assumption. The B.E.I.R. Committee, whose findings are the basis of present NRC design objectives, invented the linear-linear hypothesis for low doseage radiation risk estimates.

So it is not true that no adequate basis exists for extrapolation from high doseage to low doseage effects in regulatory practice. (FF 109, E 48, 49, 50, Tr. 2025) But the greater significance of the Board's error in its findings 108, 109, 110, and 110 is that it is not logical to expect a simple linear relationship between radiation dose alone and multiplicative health effects dependent on enteraction with chemicals and timing of exposures. (FF 106).

The Board's apparent expectation of such a simple relationship and insistance on interpolation among multiple factors when the only known factor is radiation dose deny the complex nature of synergistic and/or cumulative biological responses. These complex responses are often optimized only in

one dose range and disappear at higher or lower doses; they are sometimes more apparent in fractionated doses; they are often dependent on the sequence of and intervals between exposures to chemical and radiation doses; and the biological responses vary qualitatively over time and doseages.

The Board not only fails to recognize the state of the art in synergism research today, but also fails to comprehend the basic scientific methodology applicable to low-level long-term epidemiological studies. Though the Board insists on a level of certainty which is neither possible nor necessary in order to make a decision, Joint Intervenors have presented a prima facea case that synergistic and cumulative health effects can result from routine operation of Waterford 3. The burden of ruling out the possibility of such effects lies with the Applicant. (E 46-50) Rather than studying the implications and applications of all pertinent materials, the Board sought continually to limit Joint Intervenors' evidence and testimony to the narrowest possible scope so as to exclude documents unfavorable to Staff's and Applicant's position (E 72, 74, 10 C.F.R. 2.740 (a) (b), 2.743 (a) (h) (i), 2.760 (a)) The Board apparently chooses to base its decision not upon allowable radiation doses cited in 10 C.F.R. 50, but upon Applicant's own estimated doses. (FF 99, 100, 102) Since, in actual operation of the plant, no action would be taken by the NRC should actual doses to the public more closely approximate allowable levels than Applicant's estimated levels, the operating license hearing is the appropriate point - the only point, in fact - at which to determine the impact of the total dose or radiation from all pathways on the synergistic and/or cumulative health effects of populations in South Louisiana. (10 C.F.R. 50, App. I, E 38)

(4) MAKING FINDINGS OF FACT WHICH ARE FALSE AND UNSUPPORTED BY ANY EVIDENCE (E 51, 56)

Other unsupported or false Findings of Fact made by the Board are discussed in other categories. Exceptions 51 and 56 are grouped together because they are so patently false. Dr. Branagan estimated that certain individuals could be exposed to 23 millirems annually or 27% above the so-called "natural" background (which includes man-made radiation). 27% of background is hardly a small percentage. (Tr. 879, 880, FF 109) Similarly, the Board's finding that Staff and Applicant's projections concerning estimated emissions agreed within narrow limits is not supported by Dr. Branagan's pre-filed testimony. (Tr. 773-775, E 56) The alleged agreement between Staff and LP&L witnesses concerning estimated emissions and effects therefrom is derived solely from Staff's suspicious eleventh hour changes. Once again, the Board permitted Staff attorneys to profit from their misconduct. (Tr. 787)

(5) APPLICATION OF A DOUBLE STANDARD IN EVIDENTIARY RULINGS

The Board consistently applied a double standard in evidentiary matters in favor of LP&L and the NRC staff. The Board excluded admissable evidence offered by Joint Intervenors while allowing LP&L's staff witnesses to testify beyond their area of expertise, and allowed the NRC staff to knowingly present false testimony.

When Joint Intervenors became aware that Dr. Epstein would be unable to attend the hearings in person, Joint Intervenors moved to introduce Dr. Epstein's testimony via a telephone deposition or by sponsorship through the testimony of Dr. Johnson or Dr. Bross. (E 52, 53) The Board summarily rejected Joint Intervenors' attempt to introduce Dr. Epstein's testimony through Dr. Johnson's or Dr. Bross's testimony without giving Joint Intervenors an opportunity to lay a predicate for the introduction of Dr. Epstein's testimony. (E 52, 53) When offered the opportunity to hear the testimony of the esteemed author of The Politics of Cancer the Board ruled that the logistics of a telephone conversation would be "too impossible" (Tr. 363-365) and that it is important that expert witnesses dealing with "technical" subjects be seen by the Board. The Board's decision is totally contrary to the experience of the Federal Courts which frequently permit telephone depositions. Again, the Board, in its haste to exclude Dr. Epstein's testimony, arbitrarily decided that the logistics would be impossible, foreclosing any discussion of how such a deposition could be arranged.

The Board's decision that technical experts must be seen is totally unsupported by and authority.(E 55) Lay witnesses testifying about facts are generally judged by their credibility and demeanor. Expert witnesses

testify concerning an objective body of knowledge. Their credibility is determined by cross-examination on their knowledge of their subject.

While the Board was quick to strike testimony or evidence proffered by Joint Intervenors, it repealed the rules of evidence for LP&L and Applicant.

Although LP&L's witness, Fabrikant, admitted that he did not have the expertise to criticize Dr. Bross's epidemiological works, (Tr.) and that any panel which relied upon him as their epidemiological expert would be considered a weak panel (Tr.) the Board permitted Fabrikant to testify as an expert concerning epidemiology and to criticize Dr. Bross's epidemiological works, (Tr. , E 42, 43, 44) The Board created a new qualification for an expert witness- osmosis, i.e., Fabrikant could testify as an expert in epidemiology because he has "rubbed shoulders" with epidemiologists on scientific panels. (E 44) Even more arbitrary than the Board's osmosis ruling is its decision that Fabrikant was qualified to testify concerning Dr. Bross's mental impressions and beliefs. (Tr. , E 45)

The Board's evidentiary double standard is further illustrated in the Board's permitting Staff's witness, Dr. Branagan, to materially change his testimony immediately before testifying. (E. 56 - 58, Tr. 763-773, 778) Branagan testified that he noticed some of these changes the night before the hearing, but (Tr. 778) some of these changes were communicated to Staff attorneys, (Tr. 780 - 781) substantially prior to the hearings. Despite Staff attorneys' knowledge that Branagan's sworn prefiled testimony was false (Tr. 780-781, 787) Staff attorneys deliberately furnished this false testimony to the Board and Joint Intervenors. The Board's refusal to strike Branagan's testimony and/or untimely changes which Joint Intervenors were

notified of only when it became apparent that Staff attorneys' attempts to present false testimony had been discovered, further, indicates the Board's bias. (Tr. 763, 780-781, 787, 793) Also noteworthy is the Board's passivity in accepting explanations from Staff witnesses and attorneys in contrast to continued questioning of Joint Intervenors explanations concerning minor procedural matters.

(6) FAILURE TO ADDRESS CONCERNS OR QUESTIONS RAISED BY LIMITED APPEARERS CONCERNING THE FAIRNESS AND COMPETENCE OF THE ASLB, NRC, AND STATE AND LOCAL GOVERNMENT

The Board throughout both evacuation and synergism hearings failed to address concerns or questions raised by limited appearers pursuant to 10 C.F.R. Part 2, App. A, V.(d)(1), 10 C.F.R. 2. 760 (a), and 10 C.F.R. Part 2 App. A, VIII (b). Numerous witnesses testified to their concern about the incompetence or bias of the ASLB, the NRC, and state and local officials. (Tr. 139, 149, 157, 165-169, 179, 187, 194, 196-199, 204, 208, 216, 219-225, 237-238, 255, 265-275, 276-278, 299, 301, 311, 327, 570-575) By consistently adopting a double standard in favor of LP&L and the NRC and in arbitrarily failing to consider unrebutted expert testimony by Joint Intervenors, the Board confirmed the fears of limited appearers that the ASLB, NRC, and state and local officials are unconcerned about the health and safety of the people of South Louisiana. (E 86)