

STATE OF NEW YORK PUBLIC SERVICE COMMISSION

CASES 26529 & 26559—Common Record Hearings on the Health and Safety of 765 kV Transmission Lines.

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Amicus Curiae Reply Brief
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*This reply brief generally employs the chapter and section headings of the RG&E initial brief. A separate response to the Niagra Mohawk and PASNY brief was not necessary because their arguments were dealt with in the Amicus Curiae Brief of Andrew A. Marino.

Introduction

A. Issues in Perspective

Counsel for RG&E argue that the issues raised in the health and safety hearings are not

new. Counsel are in error.

In the present hearing, the Commission is called upon to consider questions of law and science which have never before been raised in the history of mankind. Operating in the marketplace, our great and powerful electric utility corporations provide services crucial to the well-being of society. The industry, however, evolved and matured in the absence of laboratory study of the biological impact of the electromagnetic environment created by its high voltage transmission lines. About 1970, scientists began performing laboratory experiments in which animals were chronically exposed to an electromagnetic environment similar to that created by high voltage transmission lines. By 1972, positive effects were reported in about six such studies; by 1974, approximately 10 reports had appeared. Thereafter, the number of reports of biological effects of extremely low frequency (ELF) radiation has increased dramatically. It was, therefore, inevitable that the interests of the utility industry would clash with the new, emergent knowledge. Such a clash occurred in New York, before the Public Service Commission, and subsequently in California, before the Energy Resources Conservation and Development Commission. Both Commissions are called upon to evaluate the arguments of the utility industry and the quality of the biological research. The scope and depth of the New York hearing is unparalleled even by comparison to the California proceeding, and the burden of responsibility on the New York Commission is correspondingly greater. The issues raised in New York by: (1) the applicants' assertion that the electromagnetic environment of the proposed transmission is not hazardous; (2) the quality of the biological literature which is antagonistic to their position; (3) studies from the Soviet Union; (4) the Helliwell Phenomenon; (5) the role of synergism; and (6) the biological effects of subthreshold induced currents—have never been previously raised, considered or litigated in any fair or meaningful way before any administrative or judicial forum in the free world. Thus the issues before the Commission are both novel and momentous. The Commission's decision will profoundly affect American society. The Federal Government, which presently has guideline authority, but no regulatory authority, with respect to high voltage transmission line induced biological effects, has followed the common record hearing from its inception. The Royal Commission on electric power planning for the Province of Ontario, the California Energy Resources Conservation and Development Commission, and the Minnesota Environmental Quality Council have all shown keen interest in common record hearings. Numerous trade publications reflect the great concern of the industry for the outcome of the New York hearings.

Thus the common record hearings have no historical parallel as is clearly recognized by the industry in general, and by all state and federal authorities who have related responsibilities, notwithstanding counsel for RG&E's argument that the common record hearing is just another transmission line hearing.

B. Evaluation of Probable Adverse Environmental Impacts

Counsel for RG&E argue that certification by the Commission must be based on probable environmental impact. They are in error.

“The Commission may not grant a certificate...unless it shall find and determine...the probable environmental impact.” (Public Service Law Section 126). The law, phrased in the negative, makes a determination of the probable environmental impact one of the minimum conditions of certification. The Commission has been given broad discretionary powers. “The Commission shall render a decision upon the record of either granting or denying the application as filed or granting it upon such terms, conditions, limitations or modifications of the construction or operation of the facility as the Commission may deem appropriate.” (Public Service Law Section 126(1)). Thus, the Commission may condition or deny certification on any basis that does not constitute abuse of discretion; in particular, the Commission may condition or deny certification on the basis of environmental impacts which may not be probable, but which nevertheless pose an unwarranted, unnecessary and a new risk of hazard to the people of New York.

In any case, the applicants’ interpretation of the statute is mooted because the scientific evidence establishes that the occurrence of biological effects in humans is a probable environmental impact resulting from chronic exposure to the lines.

Chapter I—Operating Experience with 700–800 kV Transmission Lines

A. Existing 700 kV Systems

The utility operating experience argument, which had been advanced by counsel for RG&E on pages 12, 14, 15, 16, 17, 22 and 24–28 of applicant’s brief, is illogical, irrelevant, and self-serving.

Let us assume, *arguendo*, that no complaints have ever been made to any electric utility companies concerning the operation of their high voltage transmission lines. Assume further, that no complaints have ever been made to any other public or private organization, group, or governmental entity. Finally, assume that not even one person living or working near high voltage transmission lines has ever, even in his or her most private thoughts, contemplated the possibility that such periodic exposure to high voltage transmission line fields could have any biological effect. It may be justifiably concluded from the aforesaid assumptions that exposure to the fields of high voltage transmission lines does not produce, nor is even suspected of producing, biological effects which are gross, immediate, obvious and acute. It would be irrational to conclude that there could not be a causal link between the fields and biological effects in exposed subjects, because there exists a myriad of biological effects which are neither gross, immediate, obvious, or acute. The relationship between biological effects and exposure to electric and magnetic fields might properly be explored in laboratory experimentation, or controlled epidemiological studies; the absence of complaints, however, is an altogether inadequate substitute.

Counsel for RG&E have seriously misunderstood the basic purpose of the common record hearing. It has been assumed by all witnesses from the beginning that exposure to the fields of high voltage transmission lines does not cause gross, immediate, acute and obvious biological effects in exposed subjects. The common record hearing was instituted to explore the nature and extent of all other biological effects which arise from

exposure to high voltage transmission lines. Thus, when counsel advanced the utility operating experience argument, they do not aid the state of analysis in this hearing, because the argument is irrelevant to the issues considered herein.

The utility operating experience argument is self-serving. There has been no thorough examination, on this record or in any other forum, of the efficiency of the process whereby the existence, the number and the nature of complaints to utilities about gross biological effects becomes generally known. With these factors in mind, the dearth of documented instances of gross, immediate, obvious and acute biological effects in subjects exposed to existing high voltage transmission lines does not appear to be a prudent basis upon which to conclude that such effects have not occurred.

B. Exposure to Operating 700 kV Lines

Counsel for RG&E cite two Soviet studies, and studies by Kouwenhoven, Hodges and the New York State Agricultural Resources Commission to support a contention that exposure to 700 kV transmission lines does not produce “readily observable” biological effects. The reports cited, however, support a conclusion opposite to that reached by counsel.

It is conceded that both Soviet studies reported readily observable biological effects in human subjects exposed to high voltage transmission lines as compared to control subjects. Neither the Hodges nor Kouwenhoven studies employed controls, and thus they had no basis upon which to decide what constituted an “effect”; a fortiori, they had no basis upon which to find “readily observable” effects. In the Agricultural Resources Commission Survey, two dairy men reported that milk production had increased following construction of a high voltage transmission line, and two reported that there had been no change. Additionally, 11 crop farmers reported that they were satisfied with their crop yield, but 7 farmers reported dissatisfaction with the crop yield. Of the 9 farmers who grazed animals under the high voltage transmission line, 3 farmers reported that the line affected the pattern of grazing. Thus, the Agricultural Resources Commission Report described readily observable biological effects on crop yield, animal grazing pattern and milk yield. It follows, therefore, that in all studies in which such an observation was possible, readily observable biological effects were produced by exposure to the fields of high voltage transmission lines.

Electric Fields

On pages 60–86 of their brief, counsel for RG&E argue that scientific theory, properly understood, proves that the proposed transmission lines will not cause biological effects in exposed subjects; and also, that the experimental, scientific literature which tends to establish the opposite conclusion may be explained away as incompetently produced or irrelevant. Each of counsel’s arguments are in error.

At pages 60–68, counsel for RG&E advanced the biophysical calculations argument, citing the testimony of their witnesses Carstensen and Schwan. The testimony of both witnesses has been discussed at length (AAM-76-106, 138–144)*. The argument fails

because of its inherent arbitrariness. The calculations presented by Carstensen in Exhibits NNN and D-4 were rigged, ab initio, to produce small numbers, which later might be argued to be negligible. In contrast, Marino's Exhibit G-5, which, of course, applies to ELF frequencies in general and 60 hertz in particular, shows that there are many valid mathematical models which yield a vast range of numerical values, depending upon the assumptions one chooses to make. It should be noted that Marino's exhibit, but not Carstensen's exhibits, is being published in the peer reviewed scientific literature.

In their prefiled testimony, applicants' witnesses Schwan, Carstensen, Michaelson and Miller each urged that there existed a corpus of experimental scientific reports which showed that the proposed transmission lines would not cause biological effects in exposed subjects. Marino pointed out that the applicants' reliance on the experimental literature was illogical (Marino 12321-123Z7).^{*} Counsel for RG&E now apparently agree with Marino; at pp. 68–83 they attack the reports which describe ELF field induced biological effects but they do not advance affirmatively the scientific reports originally cited by their witnesses. Thus the issue presented to the Commission is whether all the reports of biological effects of ELF fields cited by Marino are unreliable as claimed by counsel for RG&E. It can be seen that counsel have dug themselves a deep hole; they have framed their case so that either an entire area of scientific inquiry is populated with incompetence, or their client's position is erroneous. Counsel urged the Commission to disregard the experimental scientific literature, but their plea must be denied because it is wholly baseless, self-serving, and at variance with reality.

Chapter IV— Magnetic Fields

At pp. 86–95 of their preliminary brief, counsel for RG&E argue that: 1. the magnetic field of the proposed transmission lines is not new or unique, 2. scientific theory predicts that the magnetic field will be biologically harmless and 3. the experimental literature supports their view. With respect to each contention, counsel are in error.

The magnetic field surrounding the earth (about 5 gauss) antedates life on earth. All life evolved with the magnetic field present in the environment, quite as real as many other factors, such as the chemical composition of the earth and the atmosphere. The magnetic field of the proposed transmission line is about equal in magnitude and differs fundamentally in frequency from the earth's field. Thus, if the proposed lines were energized, subjects in the vicinity thereof would immediately begin experiencing a dramatically different vector magnetic field (sum of natural and artificial magnetic fields) than was present throughout evolutionary history. "New" and "unique" are relative concepts. If one considers for example people who work in a magnet factory, then relative thereto the aforesaid vector magnetic field could not be considered new or unique. Similarly, if we consider people in intimate, continuous and prolonged contact with some household appliances, then, since a magnetic field also emanates therefrom, the aforesaid vector magnetic field could not be considered as new or unique. If we put aside special cases as exemplified above, it can be seen that the overwhelming majority of subjects that would be exposed to the magnetic field of the proposed transmission line would thereby be exposed to a magnetic environment totally new and unique with

respect to the evolutionary history of life on earth.

Scientific theory in the sense of calculations and equations as referred to by counsel, can be advanced to explain known cause and effect relationships, and, to predict new such relationships. In physics the latter use is common; in biology however, it is almost unknown. Thus to urge that scientific theory does not predict that the magnetic field of the proposed transmission line will cause biological effects is to state a nullity. It is akin to arguing that the potential of a specific chemical to cause cancer is nil, solely because scientific theory does not predict such a relationship. Scientific theory is equally insufficient to establish the absence of a relationship between the magnetic field of the proposed transmission line and biological effects in exposed subjects because such theory is unrelated to the likelihood of occurrence of such effects.

In his direct testimony in 1975, Marino referred to the Beischer study and the Clam Lake observations to support the conclusion that the magnetic field of the proposed transmission line might cause biological effects in exposed subjects. At pages 88–94 of their brief, counsel for RG&E analyze both reports and conclude that no basis exists for such a possibility. Counsel neglect however, to analyze Marino's rebuttal testimony, given in December 1976. On the basis of the information then available, Marino concluded that exposure to the electric and magnetic fields of the proposed transmission lines will probably cause biological effects in exposed subjects (Marino 12327–12773, 12886). The additional studies analyzed by Marino but neglected by counsel in their preliminary brief, are those of Bassett, Persinger, Ehrman, Milburn, Gibson, Ossenkopp, Friedman, Smith, Southern, Graue, and Larkin. These studies, and additional studies, establish that the magnetic field of the proposed transmission line alone would probably cause biological effects in subjects exposed thereto.

Chapter VIII—Synergistic Effects

Counsel for RG&E allege without basis that there is no evidence of synergistic interactions due to high voltage transmission lines, and therefore that concern for such effects should be ignored.

The absence of evidence of the impact of an environmental pollutant on involuntarily exposed individuals is always a matter of grave concern. Counsel concede that there are no controlled laboratory studies of the synergistic potential between the electric and magnetic fields of the 765 kV transmission line or, between the fields taken together and other factors in the environment (AAM 29). Put another way, the biological consequences of the actual exposure conditions which would prevail if the proposed transmission line were energized have not been studied. In the analysis of environmental impacts, it is a basic principle that the agent evaluated must bear some reasonable relationship to that which occurs in the environment. RG&E's position runs afoul of this principle because it asserts the nonexistence of biological effects in the absence of any relevant data. Thus the burden of proof is upon RG&E to demonstrate that there exists reliable experimentation indicating that the specific agents which they propose to expel into the environment (the electric and magnetic fields of the proposed line) are not hazardous. It is legally insufficient for counsel for RG&E to argue that

others have failed to establish that the agent is hazardous.

Chapters IX & X—Helliwell Phenomenon and Global Weather Patterns

Counsel for RG&E and staff concede that the Helliwell Phenomenon exists, but argue that the possible effects thereof on global weather and on the incidence of human skin cancer are both unproven. We agree. All counsel have left unanalyzed however, the most significant aspect of the Helliwell Phenomenon; namely, what is the proper response of the Commission to the uncertainties associated with the evidence thus far adduced concerning the Helliwell Phenomenon?

Prior to Marino's testimony, the Commission was unaware that radiation from high voltage transmission lines affected the dynamics of the magnetosphere. Now that such effects have been unequivocally established on the record, the Commission must move affirmatively to determine the biological consequences. The Commission's responsibility ends only when it determines on the basis of independent scientific opinion, that no credible health hazard is presented.

Chapter XII—Analysis of Dr. Marino's Testimony

A. Dr. Marino's Hypothesis

Marino testified that "In view of the number and diversity of reports, it is probable that some situations involving the transmission line electric field will be associated with biological effects." Counsel for RG&E concede at page 142 of their brief that the aforesaid words have a clear and plain meaning, but counsel alleges that they are too speculative and hypothetical to be relied upon by the Commission. Counsel are in error.

1. "In View of the Number and Diversity of Reports."

Marino has specifically identified for counsel 53 scientific reports which describe biological effects due to ELF fields (Marino 12777). He has analyzed the reports and has pointed frequently to their consistency of results. He has testified to the adequacy of the data and the experimental protocol of each study, including those studies upon which counsel conducted cross-examination. Before any individual report is accepted into the body of established scientific knowledge, the report must be carefully scrutinized to determine the reliability of the experimental design, techniques used, data obtained, and analytical methods used. Marino has performed this function with regard to each of the ELF reports cited to counsel (12777). Thus, the biological literature contains many reports of ELF effects, authored by competent scientists, which are reliable and consistent. Moreover, the reports deal with diverse biological systems, and this factor greatly enhances their reliability. The reports involve the study of man, monkeys, mice, rats, guinea pigs, amoebas, rabbits, slime mold, flat worms, cells, birds, fish, plants, chicks, bees, and dogs. Thus it may be truthfully, accurately, specifically and concisely said that there exists many reports of ELF biological effects on diverse biological systems.

2. "It is Probable."

The phrase means more likely than not (Marino 12798), notwithstanding the confusion evinced by counsel in his brief at pages 124–129.

The relationship between cause and effect is not absolute, but rather is qualified by the conditions of observation. If one finds the same cause and effect relationship under two different conditions of observation, then the confidence in the correctness of the relationship is increased. Thus, if ELF fields cause a biological effect under one set of conditions and a different biological effect under a second set of conditions, one may justifiably conclude that the second observation renders it more likely that the original observation—that is that ELF fields can cause biological effects—is valid, and not merely fortuitous. The first observation similarly provides support for the second observation. Now, let us suppose that both observations occurred following utilization of ELF fields that are identical or similar to those which will emanate from the proposed transmission lines. The prudent scientist may not conclude that the same biological effects seen in the laboratory will occur in subjects exposed to high voltage transmission lines because the conditions of exposure to such lines will necessarily differ from those employed in the laboratory; the prudent scientist must conclude however, given the close parallel between the controlled experimentation and the environmental exposure, that the same or similar biological effects might occur in the exposed subjects. Suppose, further, that there exists three, not just two, independent observations of biological effects following exposure to ELF fields in the laboratory, and that the fields are similar to those which would emanate from the proposed transmission line: the position of a prudent scientist would be the same, except perhaps for a belief that the possibility of an effect in the subjects exposed to the fields of high voltage transmission lines is now somewhat greater, based on the existence of three, not two, independent laboratory observations of ELF biological effects. Clearly as the number of reports increases, the degree of correctness one may associate with the nexus between the fields of the proposed transmission line and biological effects in exposed subjects increases proportionately. One might argue endlessly over the question of the requisite number of studies for each linguistic description (probable, possible, likely, reasonably certain, conceivable, almost certain, far from nil, substantial, material, real, well-founded, etc.). In particular, Marino has expressed the opinion that he 53 cited reports justify the term “probable.” It is recognized however, that reasonable men may differ on linguistic descriptions.

3 & 4. “Some Situations Involving Transmission Line Electric Field.”

The whole range of different kinds of interactions are possible between the transmission line fields and people in the environment. They vary from a single brief encounter, to chronic exposure such as occurs for individuals living very close to a transmission line. The lesson of the literature is that “some situations will probably result in biological effects, and other situations will probably not result in biological effects.” (Marino 7200). Unless and until the requisite research is performed however, it is not possible to precisely evaluate the degree of risk associated with specific situations (AAM 24–27). An attempt to do so would, in the absence of sufficiently specialized research, be justifiably subject to criticism as speculation. To refrain from giving opinion concerning very specific conditions of exposure, which are as yet unstudied, is to act prudently.

5, 6 & 7. “Associated with Biological Effects.”

The probable impact of the fields of the proposed transmission line would be to cause alterations in the growth, behavior, or physiology of the exposed subjects (AAM 24–27). At pages 137–142 of their brief, counsel for RG&E argue that knowledge of the physical mechanism involved in the aforesaid effects is a sine qua non to establishment of a causal role of the transmission line fields. Counsel are wrong.

Many agents constituting environmental pollution have come under regulatory control in recent years. It is by far the rule, and not the exception, that the biological mechanism of action of the aforesaid environmental agents is largely unknown. State and federal law condition the scope and degree of regulation on the fact of causality not on the knowledge of the underlying mechanism thereof. Thus knowledge of the mechanism by which ELF fields produce biological effects is clearly unnecessary both legally and logically, to the establishment of the existence of such effects.

Summary

Marino’s testimony that: “In view of the number and diversity of reports, it is probable that some situations involving the transmission line electric field will be associated with biological effects” is as clear, precise, and accurate, as is permitted by a diligently complete analysis of the existing scientific literature. It would be deceptive to say less and imprudent to say more, and counsel’s repeated invitations to move in either direction were therefore rejected justifiably.

B. Dr. Marino’s Recommendations

Pages 144–150 of RG&E’s brief are significant for what they do not state. The applicant professes to analyze Marino’s recommendations to the Commission. Inasmuch as counsel for RG&E has not specifically addressed the recommendations that: (1) a notice of dispute should be sent the citizens of the State, (2) a panel of independent scientific experts should be appointed to evaluate the Helliwell phenomenon, (3) a panel of independent scientific experts should be appointed to obtain the Soviet scientific literature, (4) a panel of independent medical experts should be appointed to evaluate the health hazards of the proposed transmission line, (5) the Commission invite the authors of the scientific literature who have been impugned by applicants’ witnesses to appear and answer the charges, (6) the Commission create an administrative research counsel—it should therefore be presumed by the Commission that RG&E joins in the aforesaid recommendations.

C. Scientific Analytical Abilities

1. Analysis of the Literature

Marino cited 53 studies to support the conclusion that the electric and magnetic field on the proposed transmission line will probably cause a biological effect in exposed subjects (Marino 12777). In 49 instances no controversy was generated; in 4 instances, however (Vasek, Gibson, Knickerbocker, and Milburn), counsel for RG&E believe that

the authors disagree with Marino's description of their research. Counsel are wrong again. Vasek reported slightly enhanced growth of vegetation under the center conductors of high-voltage transmission lines which had been in operation up to 38 years, as compared to vegetation located more distantly. The authors have pointed out the possibility that the enhanced growth may be due to condensation of rain on the center conductors, or, the casting of a shadow by the center conductors. Bearing in mind that the study was conducted in the Mojave Desert, Marino expressed the opinion that the reported effects were most probably due to the electromagnetic environment created by the high-voltage transmission lines (Marino 12859–12870). The authors have expressed no disagreement. Clearly the opinion of counsel that the growth enhancement was due to disruption caused by construction 38 years earlier, is erroneous, because the vegetation examined grew in an area that was undisturbed during construction. Counsel's witnesses have expressed no opinion. Milburn, in a doctoral dissertation, found that some people could learn to perceive a magnetic field very similar to that which would be produced by the proposed transmission line (Marino 12870–12876). As counsel recognized at page 164–165 of their preliminary brief, Milburn has never expressed disagreement with Marino's testimony.

Gibson, in an experiment performed at the Naval Aerospace Research Institute, purported that 24 hours exposure of human volunteers to one gauss at 45 hertz caused changes in cognitive function (Marino 12885–12892). Gibson has never expressed disagreement with Marino's testimony. On the contrary, Gibson has stated "for the exposure duration and intensity levels of the ELF magnetic field used in these pilot studies, human psychomotor functions appear to be unaffected. Neither of the predominantly psychomotor tests used yielded anything of significance. Both of the predominantly cognitive tests yielded statistically significant results" (Marino 12891.)

Knickerbocker found that the male progeny of mice exposed to an ELF electric field was smaller than those of the controls. (Marino 7178, Michaelson 3727). Applicant's witness Michaelson has testified that "this difference, although statistically significant, was not thought by the authors to be of biological significance" (Michaelson 3727). Knickerbocker's work was sponsored by the American Electric Power Corporation, and was published in 1967. Of the 53 reports cited by Marino to support the conclusion that the electric and magnetic fields of the proposed transmission line will probably cause biological effects, only one published before the Knickerbocker study. Bearing these factors in mind, it was reasonable, in 1967, that Knickerbocker should deemphasize the implications of his results. In 1977 however, it cannot be reasonably argued that Knickerbocker's statistically significant results have to probative value when the issues of health and safety of high voltage transmission lines. Knickerbocker, who presently works in Philadelphia, did not testify in the hearing, and has not expressed disagreement with Marino's testimony.

2. Analysis of Applicant's Testimony

At pages 170–171, counsel argue that a prudent scientist could have guessed applicant's witnesses rebuttal testimony from applicant's cross examination of staff's direct case. Counsel's position must be rejected as unreasonable. At pages 171–175,

counsel argued that Marino improperly cited applicant's witness Carstensen. Counsel's error may be verified by consulting directly the cited portions of the transcript.

3. Consistencies

At pages 175–176, counsel argued that Marino has inconsistently described the relationship between the research of Hamer and Konig. Counsel are in error (See Marino 8897–8927). At pages 176–178, counsel argued that Marino has presented some data which he considered invalid. Counsel are wrong (See Marino 7841–7846). At pages 178–179 counsel argued that Marino's testimony regarding the statistical significances and their relationship to pooled sera has changed during these proceedings. Counsel are wrong again (See Marino 7642–7730, 7802–7840, 12464). At pages 179–180 counsel argued that it is improper for a scientist who has presented data on blood proteins in a specific format, to subsequently change or alter the format of presentation of the data. Counsel are in error (see Exh. B-6, Z-5, E-4).

At pages 180–181 counsel argued that Marino's use of the phrase "narrow range of electric field near 150 volts per centimeter" at transcript page 12463, when referring to experiment 6, is not justified. Inasmuch as the time weighted average range of electric fields to which the rats in experiment 6 were exposed was 150–163 volts per centimeter, not 150–300 volts per centimeter as assumed by counsel, counsel has erred (Exhibit E-4).

At pages 181–183 counsel argued that Marino was unaware of the costs of his experiments, and was lax in his survey of the scientific literature. Counsel are in error (See Marino 12462, 12821–12858). At pages 183–186, counsel argued that Marino improperly withheld data. Counsel are wrong (See Marino 12466, 12852–12858, Exhibit F-4, G-4, H-4, J-4, P-4, Z-5 and B-6).

4. Experimental Design and Analyses

At pages 186–195 of their preliminary brief counsel for RG&E argue that their witness Hess' analysis of Marino's data is more reliable than Marino's analysis. Counsel are wrong (See Marino 12461–12470, 13052–13072).

5. Objectivity

At pages 196–197 of their preliminary brief, counsel for RG&E argue that Marino and Becker used inflammatory language in a letter to Governor Carey. At pages 197–198 counsel argue that Marino used inflammatory language in a letter to the Editor of the Rochester Democrat and Chronicle. At pages 199–203 counsel argued that Marino inaccurately characterized two memoranda by the Minnesota Department of Health. At pages 203–213 counsel argued that Marino inaccurately characterized a letter written to him by LaFrance. In each instance, counsel is wrong.

Letter to Governor Carey

Marino and Becker wrote to Governor Carey concerning the 765 kV power line

presently under construction by the Power Authority (Exhibit J-5). Counsel for RG&E object to the use of the word "imminent" therein, which occurred in the first paragraph. "We are a body of medical research scientists, whose specialty is the study of the effects of electricity on biological systems. We wish to bring to your attention the imminent health hazard posed by construction of a 765,000 volt transmission line by the Power Authority of New York." Marino and Becker believe that "imminent" was properly, correctly, reasonably and precisely employed in the letter (Marino 12507-12520). The contrary opinion of counsel for RG&E is arbitrary, because it is unsupported by evidence.

Letter to Rochester Democrat and Chronicle

The producers of the CBS television show "60 Minutes" informed Marino and Becker of their intention to explore both sides of the issue of the health hazards of high voltage transmission lines. The producers explained that their intention was not to reach judgments concerning the nature or existence of health hazards, but rather to put forth both sides of the issue before the American public. As an indicia of their competence and fairness, the producers pointed to the high esteem in which the program is held by the general public. The producers thereupon asked Marino and Becker to appear on the program, and both agreed and were interviewed by Mike Wallace. Thereafter, as counsel for RG&E concede, RG&E construed the nature of its employment contract with their witnesses Michaelson and Miller as insufficient to require either witness to submit to an interview. Moreover, as counsel for RG&E concede both Michealson and Miller declined to be interviewed whether as agents or spokesman for RG&E, or, in their own right as individuals who had studied the issues. Michealson and Miller's decision was particularly difficult to understand. Each man had testified in the common record hearings that the proposed transmission would not be hazardous. In every instance their testimony was heard by a very small number of people, and almost no members of the public or press. When therefore, they were presented with an opportunity to explain their position to an impartial interview for the ultimate benefit of 30 to 40 million television viewers, and thereby account for the basis of their views directly to the general public, their refusal to do so seemed inexplicable. Marino thought it propitious to communicate the facts recited above to the Editor of the Rochester Democrat and Chronicle, in the hope that local initiative might induce Miller and Michaelson to come forward and explain their position before a significant number of people as would be presented in the audience of a "60 Minutes" report. The letter was taken from the Editor of the Rochester Democrat and Chronicle, or given by him, to unascertained individuals. The letter was subsequently offered as evidence in the common record hearings by counsel for the Power Authority (Exhibit I-5); the letter was not published in the Rochester Democrat and Chronicle. Counsel for RG&E's concern with Exhibit I-5 is their perception of it as criticism of RG&E based on the fact that no health and safety hearings were held in Rochester. Counsel's concern is unfounded. Even if every health and safety hearing had

been held in Rochester, the letter would still have been sent because its intent was to encourage participation of Michaelson and Miller before a significantly large audience, and to encourage discussion of the merits of their position (Marino 12972–12981). Thus, counsel's concern with regard to Exhibit I-5 is unsupported by evidence, and their argument based thereon is not significant.

Minnesota Department of Health

There is a proposal to build a DC high voltage transmission line to North Dakota and Minnesota. In early September 1976, the Minnesota Department of Health favored construction of the proposed line (Exhibit S-5). Beginning in late September 1976, Becker and Marino received a number of requests for information and comment on Exhibit S-5 from state and federal legislators, farmers, state administrative officials, and other interested citizens. Based partly on the information provided, the Department of Health reversed its position. [State Register (Minnesota) December 27, 1976, Page 960]. The Department is now seeking information outside the Department on the safety and health effects associated with operation of high voltage transmission lines. In January 1977, the Department wrote to Marino and Becker requesting information. In July 1977, Governor Perpich, of Minnesota, announced that consideration was being given to the institution of a "science court" to determine the health and safety issues posed by the proposed construction of the DC high voltage transmission line. Counsel for RG&E, who argue that Marino's characterization of Exhibit S-5 (Marino 13087-13099), is not accurate, are in error (Exhibit S-5). The facts and events surrounding this letter prove his position has no merit.

LaFrance

Late in 1974, Marino was contacted by LaFrance, then working on Electric Power Research Institute Project RP-98, who offered to make a measurement of the electric field inside an exact duplicate of the apparatus used by Marino, employing an experimental electric field meter that was being developed for the Electric Power Research Institute. Counsel concede that the measurements per se are irrelevant to the hearing, but argue that Marino inaccurately characterized them. The record (Marino 8343-8381, Exhibit K-4) proves that counsel's position is wrong.

Chapter XIII—Summary

Counsel for RG&E had not expressed a high regard for Marino. They have been forced into this personal attack because of the weakness of the witnesses positions on the issues. In any event, RG&E's claim that the proposed transmission lines would be safe and not Marino's personality, is the issue in this case.