

Supplement to Personal and Professional
Life of Jack Casazza

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Introduction

Since completing my Personal and Professional History in January of 2010 discussion about it with other have jogged my memory about a number of other activities and events that I wish I had included. They also suggested I add more details about how things were done and the roles of various people in my life. Rather than revise the original document it seemed preferable to cover additional material in a supplement. I have indicated dates for the various events.

Foreign Activities (1964 – 2007)

In the early 1960s I became increasingly interested in the electric power systems of other countries as the AIEE was discussing a merger with the IRE, which was an international organization. I joined CIGRE and began reading the annual reports of the CEGB from England. The 1962 CEGB annual report was of particular interest because it mentioned their work with a new system for maintaining reliability in operating power supply systems called “security assessor.” I arranged to visit them in 1964 on my way to the CIGRE meeting in Paris.

With the AIEE becoming the Power Society of the IEEE visits to other countries by IEEE member helped increase their interest in the IEEE activities. At the suggestion of the IEEE History Center I prepared a summary of my international activities (See Attachment 1). This is on file at the IEEE History Center along with the attachments mentioned in it.

I also prepared a history of the U.S. National Committee of CIGRE summarizing United States participation in international activities from 1921 to the present. The United States participants in these various CIGRE activities and in other international activities were almost exclusively IEEE members and help make the electric power activities of the IEEE international.

Key People In My Life

In addition to those with whom I worked with, there are a number of other key people who either influenced me or played important roles in determining my life course.

Eric Gross (1943–1980):

The earliest was Eric Gross. I met Eric when the Navy sent me to Cornell in 1943. His influence in the electrical engineering department enabled me to receive full credit for my courses at Cooper Union. He introduced me to books describing the functioning of a great deal of electric equipment and some of the real life problems of electric power systems. In 1945 I contacted him about what I should do when I left the Navy. He suggested that I work for a few years in a power system, decide what area I would be most interested in and want to specialize in, and then go back to graduate school.

Erin also influenced my career when he proposed me as the Chairman of the Technical Committee of the US National Committee of CIGRE. He provided valuable advice to me and my wife during several CIGRE meetings in Paris. He counseled me not to leave Public Service at one point in my career when I was considering other jobs, telling me some good things were about to happen for me at Public Service.

Perhaps the most important effect he had on my life was helping me to understand the importance of the technology being developed in other countries and other systems, and the problems that occur in real power systems, since he had spent his earlier life in one.

Charles Concordia (1950-1985):

I was selected by Public Service to attend the GE Power Systems engineering course in 1950-1951. The instructor in one of the courses was Charles Concordia. I quickly noted the brilliant and creative mind of Charles. Frequently sitting at the same table with him at lunch

discussing the differing phase impedances on transmission and distribution circuits that did not have an equilateral triangular spacing of the phases.

In the 1960s I had frequent discussions with him, particularly about the New York and PJM blackouts and several CIGRE papers that I had written that were presented in Paris. We continued our activities and contacts after our retirements, focusing more and more on changes in the electric power engineering profession with which we were both quite unhappy. He was particularly concerned with the decline of the technical competence in important government positions, and the decline of engineering input in government decisions, as I was. (See letter in Attachment 4).

Joseph Swidler (1960-1997):

I got to know Joseph Swidler in the 1960s, when he was Chairman of the Federal Power Commission, in connection with the blackout investigations and the National Power Survey which he directed. The National Power Survey was particularly important to the development of USA systems and lead to increased cooperation and huge benefits to the American public. About 1970s he left the Federal Power Commission (FPC) and became Chairman of the New York Public Service Commission.

In 1977 I decided to leave Public Service because of changes being made. Ed Snyder, former PSEG CEO, told me that the PSEG board was de-emphasizing technology competence and was focusing on obtaining the necessary rate increases. While Joe was a lawyer, I felt he had a high regard for engineers. I contacted him and he went with me and asked if I would be interested in a position heading up the technical activities for the New York State Public Service Commission. I told him I would like to think about this.

After reviewing the effects on my family and discussing the offer with a few of my friends, I decided to turn him down. A key factor in this decision was the possibility of buying the RA Ransom Company in Washington where I would run a business as I wanted to run it with very little red tape or outside oversight.

After coming to Washington and founding CSA, I contacted Joe who had left the New York Commission and had founded a law firm of Swidler and Berlin in Washington. I suggested the possibility of CSA working jointly with Swidler and Berlin for a group of utilities and opposing some of the proposed changes being considered by the Federal Government. He agreed they should be opposed, but said he had to discuss his activities with his law partners, since that was called for by his business agreement. The partners refused to give permission for him to participate in such an activity.

I continued to meet with Joe from time to time for lunch at which we discussed Federal Government proposed changes in the electric power industry structure. Joe felt they would be harmful to the country, but said he was powerless to stop them.

He also gave us free advice in our contract dispute with FERC, in which our bid for a major assignment to investigate the economics of the California power pool was selected as the winning bid, but the Chief Economist of FERC had decided we were not qualified because we were not economists. Joe said that FERC had violated government competitive bidding procedures. We asked how this could be corrected. He said it would take years and probably not get us suitable compensation for our efforts. He suggested an alternate approach. Watch for actions by FERC that could be criticized. We did so and found FERC's environmental impact statement contracted statements being made publicly by the Chairman of FERC, Martha Hesse, about the savings in generation costs that would result from proposed FERC actions. At a public

meeting I cited the contradictions between the various FERC positions. This was particularly embarrassing for FERC --- the Chief Economist at FERC resigned within three days and Chairman Martha Hesse resigned in a few months. Joe felt we had done a service to the country with our actions.

Joe spent the last few years of his life writing his memoirs. After his death I was given a copy of them and still have them in my files. The University of Tennessee has published a brief edited version of them which I don't feel shows Joe's importance and role in the history of the United States power industry. The copy of the complete memoirs I have I think is particularly valuable, and I'm not quite sure who would be interested in it.

Copies of letters from Joe over the years are included in Attachment 4.

Ted Nagle (1964-1985):

Ted Nagle worked for the American Electric Power Company (AEP) that had offices in New York while I worked for Public Service in Newark. Ted lived in Hohokus, New Jersey, while I worked for the PSEG and lived in Hasbrouck Heights a few miles away. I first got to know Ted by coordinating travel arrangements to go to meetings of groups of which we were both members. The Edison Electric Institute (EEI) System Planning Committee, CIGRE, and NERC meetings. We began to coordinate our work for a number of these activities. The NERC activities were chaired by Ted while I chaired the CIGRE activities. From time to time Ted would call me and suggest a meeting at his home to review a draft report being prepared for a forthcoming committee meeting. Our wives got to know each other and occasional all four of us would go to dinner together. We also toured Venice together in 1978. I always considered Ted's advice as very valuable.

I also got to know many of the AEP key people through my contacts with Ted. (See letter from Pete White, AEP Chairman in Attachment 4)

Bill Gould (1964- 1980):

Bill was Chairman of the Southern California Edison Company and President of the US National Committee of CIGRE when I first met him in 1970. When I became Chairman of the Technical Committee of CIGRE I had contacts with him rather frequently to discuss activities and decisions I was making. I also met him from time to time at EPRI Executive Committee Meetings of which we were both members.

Bill was a Mormon Bishop and a kind, patient person who helped me considerably. When my son John became diagnosed with lymphoma he told me to pray, explaining that his wife had been diagnosed with inoperable cancer a few years ago with a few months to live, but prayers helped, and she was now in good health. Bill stayed in constant touch with me during my son's several years of treatment and kept telling me he was praying for us.

Network Analysis Ideas (1950s)

For much of my life I have been involved in the analysis of the flow of electricity in electric power networks. Quite early in my career I began to see ways that the power network analysis methods and techniques could be used for analyzing other types of networks.

In the 1950s an analysis of gas flow networks was made using the Public Service D.C. network analyzers. This involved recognizing that line resistance had to be changed as flows changed because of the non-linear characteristics of the gas flow equations. (A gas flow network analyser was subsequently purchased).

In the 1960s an area of application was to money flow networks where money sources could be represented by generators and passage of money through various paths and

organizations represented as transmissions impedances that collected fees and interest (transmission losses). Expenditures for such purposes as salaries, fuel, equipment, etc. could be represented by loads.

Traffic flow analysis also became of interest in the 1960s where equations such as Kirchoff's laws seemed applicable; traffic should divide over alternate paths so the flow (current) over each path would require the same time (voltage drop). A problem with the traffic simulation was finding the electrical equivalent of road intersections where flows merged.

These initial ideas were discussed from time to time and occasionally lead to work by others.

Loss Reduction at PSEG (1950 – 1970)

On electric power systems there is a difference between the electric energy a company produces with its net generation plus its net purchases from other companies and the electric energy metered for its sales to its customers in a given time period. This difference is the "losses" of the system. There are two types of losses: "commercial losses" consisting of energy used by customers that is stolen by bypassing their meters or causing incorrect (lower) readings; and "system losses" consisting of energy consumed by heating " I^2R " of transmission and distribution wires and core (hysteresis) losses in transformers.

The annual losses in the PSEG system in the 1950s were about 13%. Estimates of the commercial losses were just a few percent, so the system losses were about 10%. This meant that 10% of all the net energy produced by the company was being used by the PSEG system in its operation. These losses were supplied in addition to all sales to consumers by generators operating at the highest incremental production costs in every hour.

Steps to reduce these losses were taken over a number of years. This included increasing distribution system voltage from 4 kv to 13 kv, increasing transmission voltages from 138kv to 230 kv and 500 kv, providing reactive power locally and improving voltage controls. As a result, annual system losses were reduced to about 7% in the 1970s. This was a savings of more than 3% in total annual energy production costs for the system.

Role of Electricite de France In My Career (1960 – 2000):

The employees of Electric de France (EDF) played a significant role in several aspects of my life. Their friendship was a great help in a number of important activities. On a number of occasions I was able to contact friends in EDF requesting information or arrangements to visit certain facilities, and my requests were always met.

My initial contacts with EDF started at the 1964 CIGRE meeting in Paris and grew with my increasing participation in various subcommittee and task force activities in the following 40 years. Several times I requested permission to visit the EDF National Dispatch Center and regional dispatch centers. Private meetings with appropriate EDF personnel to discuss special subjects were always granted.

A particular example was a request I received from the U.S. Government for information as soon as possible about the blackout of all of France in 1976. The U.S. Engineering staff in Paris was unable to obtain any information and there was deep concern in the White House that sabotage may have been involved. There was worry that a major portion of the United States might also be shut down. Knowing of my friends in EDF, I was contacted by a United States government official asking if I could go to France and in a short time obtain the facts about the cause of the blackout. I asked for time to contact my EDF friends to determine what I could do.

(EDF was aware of my activities after the PJM blackout in 1964 for which I had provided with any information they desired.)

After calling about a half dozen friends I was informed that they were willing to meet with me and answer my questions, but only on one condition. I was not to provide my report on the blackout causes (or discuss it) to anyone in the U.S. Government, or anyone else, until EDF reviewed and approved it. I agreed to these conditions. I was then granted a U.S. government purchase order to proceed. (This convinced me that I could be successful in a consulting company, signed the agreement to buy the R.A. Ransom Company, and left for Paris two days later.)

I had sent a list of questions to them in advance and they had arranged a series of meetings with the appropriate EDF personnel, several each day, for almost four days until I had all the information I needed. Each day I went back to my hotel room, went to sleep at 9:00 p.m., set my alarm to awake at 3:00 a.m., and wrote portions of my report until 6:00 a.m. When I awoke I had breakfast and went to the next day's meetings at the EDF offices at 8:00 a.m.

At the end of the four days I had a draft of my report in long hand in English that I gave to my EDF contacts who were to translate it into French and obtain the necessary EDF approvals. While this was being done I was taken to visit a number of EDF generating stations, substations, and dispatch centers. I then returned to the United States to await the needed French approval and have my long-hand report typed in English.

One day I visited my dentist. While the dentist was working on me, his nurse came in and said, "There is a phone call from Paris for Mr. Casazza." The dentist let me out of the chair to take the call. It was from the President of EDF who congratulated me for an excellent report and said they wanted only one change. I had discussed in my report the ongoing labor problems

in EDF and my conclusion that they played no role in the blackout. He asked that all discussion of the labor problems be removed. I agreed. And the formal report was sent to the U.S. Government.

I had become the principal owner of a consulting firm in Washington, D.C.,

Engineer's Role in the Energy Crisis (1974 – 1978)

In 1977 my daughter was a student at Seton Hall University. I went one day to pick her up, arriving about an hour early. For some time I had been deeply concerned about the role of the engineering profession in solving some of the major problems of the United States and the world – energy, food, water, pollution, et cetera. Sitting in my car I began to write, in a pad I had with me, my personal philosophy and beliefs just poured out as fast as I could write. This led to publication in 1978 in a widely circulated magazine, *Public Utilities Fortnightly* (PUF), of an article “The Engineers Role in the Energy Crisis.” (See Attachment 2).

This PUF article was complimented by my 1991 speech at the Cooper Union titled “Technical Competence, Engineering Leadership and Electric Power” (See Attachment 3, plus comments by Joe Swidler in Attachment 4.)

Government Competence (1960 – 2003)

I was involved in a number of activities and discussions dealing with our national energy policies. One of the most important is the role of our Federal Government. Perhaps my key concern was the lack of technical competence at the higher levels of the government bureaucracy where lawyers and economists dominated, most of whom had little or no knowledge about how power systems actually worked.

This was demonstrated by the lack of skill in analyzing reliability problems, such as blackouts. I was retained to analyze the 1976 blackout of France. The USA investigation of the

blackout of the mid-west in 2003 was limited by instructions to investigate only the specific technical failures that occurred. This meant no investigation of what lead up to these failures, including the role of past government policy and regulations.

Almost two years later a USA/Canadian Task Force was assembled, of which I was a member, that concluded government policy was a definite contributor to causing the blackout. Publishing this report as withheld by the US government until after additional legislation has been passed by Congress.

I have written a number of books which provide additional information of the problem and government incompetence. The most recent was, "Forgotten Roots" which was published both in English and an abbreviated form in Japanese. Attached is a letter from Japan that comments on the reception of the Japanese version, which was much better than the United States sales. (See Attacment 4.)

Past history reveals two activities in which the Federal Government met national needs successfully. The performance of a "National Power Survey" and a cost/benefit analysis of the FPC. The National Power Survey was conducted under the joint leadership of the Federal Power Commission (FPC, predecessor of FERC) Chairman Joseph Swidler and Philip Sporn, Chairman of the American Electric Power Co. (AEP) who lead the efforts of a number of knowledgeable individuals from various power systems. The resulting recommendations led to the addition of major interregional transmission lines. Estimated annual savings were \$12 billion, with actual savings by 1988 of \$20 billion. The key to the success of this effort was the technical and economic competence of the engineers from the power systems who worked cooperatively with those from the FPC.

The cost benefit study of the FPC was performed in 1970 by the Sloan School of MIT. Its success was facilitated through the cooperation of individuals in the various power systems who provided the costs for their compliance with the various FPC filings and procedures. This, coupled with the government's costs, provided an indication of the total cost of regulation. The study indicates areas where these costs needed benefits. A Copy of this report is in my home files)

Copies of Letters/Awards/Publicity/Pictures of Key Events

During my lifetime I received many letters, some awards, occasional publicity, and attended events of which pictures were taken. Some of these remain and the original copies are in a number of notebooks filed with the notebooks containing copies of my published articles and papers.

I have included in Attachment 4 copies of the ones I consider most important for one reason or another. Included are letters and notes from or to:

High US Government officials including:

Chief of Staff to the President of the USA

The President's Science Advisor

The head of NASA

The geologist who walked on the moon

Jimmy Carter

Barak Obama

Individuals who are mentioned in my original history or this supplement including:

Joseph Swidler

Edwin Snyder

Robert Hooke

Peter White (President of AEP)

Barney Capehart (Professor at Univ. of Florida)

Charles Concordia

Prof. Sekine (Japan)

Publishers from the Catholic Church who published articles with which I disagreed because they stressed saving of woodlands and animal life rather than human life.

Jack Casazza

January 30, 201

ATTACHMENTS

Attachment 1 –International Activity Summary

Attachment 2 –PUF Article “Engineer’s Role in the Energy Crisis”

Attachment 3 –Cooper Union talk “Technical Competence, Engineering Leadership and Electric Power”

Attachment 4 –Copies of letters

Some International Activities
In The Electric Power Area
As the IEEE Became an
International Organization

By
Jack Casazza
August 2010

Objective

I became a member of the American Institute of Electrical Engineers (AIEE) in 1946 after leaving service in the U.S. Navy. In 1964 the AIEE merged with the IRE to become the IEEE, an international organization.

As I dispose of my professional files it became apparent to me that many of the international activities in which I, and other former AIEE members, were involved played an important role in the IEEE becoming an international electric power professional organization, and its subsequent international growth. (Present predictions indicate a majority of IEEE membership may come from outside the United States in the future). These past activities, and those of many others, provided a strong impetus for globalization of the IEEE in electric power. Most from the United States who were involved were IEEE members who presented information based on IEEE activities to those from other countries, and brought back to the United States information about technologies and systems in other countries.

As a result, I thought it might be helpful to those responsible for the history of the electric power profession in the IEEE to furnish a summary of the international activities in which I was involved. In those international efforts I also accumulated copies of presentations, reports, documents, and material that were

presented and discussed at meetings in other countries. In addition, these meetings over a number of days provided the opportunity for friendly discussions about how things worked in the United States, including the functioning of the IEEE. They also resulted in articles in foreign publications. Discussions with the IEEE History Center lead to the decision to send this material to them since it would provide “museum” exhibits of possible value. Such materials have been labelled as “specific Attachments”, packaged individually and sent to the History Center separately.

CIGRE

My first visit to a foreign country was in 1964 when I went to the CIGRE meeting in Paris. The meeting dealt with high voltage electric power systems, lasted 10 days, and was attended by about 1,500 power engineers from about 50 countries. Almost all attending from the United States were IEEE members. I was fascinated by the presentations and discussions that took place. There was considerable interest in technical developments and experience in the United States. Enroute to Paris I stopped for two days to meet with the engineers of the GEGB in London and learned of this work with a “security assessor” in operating their bulk power system that formed the basis for development of similar systems

in the United States. I formed many friendships at these meetings, a few of which continue to the present.

My participation in CIGRE continued, with attendance until 1998 at future meetings in Paris that occurred every two even years with the exception of two meetings because of family illnesses. I presented about a half dozen papers and many discussions. (See “My Personal and Professional Life, Attachments A and B” of which the History Center has list of specific presentations). After some of these trips I spent a few days in Italy meeting in Milan and Rome with ENEL personnel to exchange information on developments relating to common problems.

CIGRE also has one week meetings in odd years covering specific committee activities. I went to most meetings dealing with system planning, delivering papers, and participating in discussions, including the following:

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|------|----------------------|
| 1987 | Dakar, Senegal |
| 1989 | Florence, Italy |
| 1991 | Melbourne, Australia |
| 1995 | Tokyo, Japan |
| 1997 | Tours, France |

At both the even year meetings in Paris and the odd year meetings those attending were delegates of their countries and were often accompanied by their wives. Many friendships developed among the wives leading to increased coordination of technical activities.

USA-USSR Technology Exchange Program

As a result of the “Kitchen Debate” between Nixon and Nikola Khrushchev, a program was established for technical cooperation between the United States and the USSR. Three areas were covered, agriculture, space, and energy. The last group had a number of subgroups; one dealt with planning and operating electric power systems. I was involved with this subgroup. Its first meeting was in Russia in 1975.

Subjects to be discussed were agreed to in advance and a representatives from each nation prepared technical papers summarizing procedures used in each nation and results. Copies of the papers presented are in a separate Attachment I.

Discussions took place in Moscow for the first few days and then were relocated to Leningrad and finally Volgograd. Visits to various power plants, substations, and dispatch centers were made at each location. Books describing some of their facilities as well as their cities were provided and are included in separate Attachment II. (Note: This material was a gift of Professor Venicov, winner of the Lenin Prize, a most prestigious award in the USSR.) Delegates from each country ate lunch together and sometimes dinners at which many subjects were discussed informally.

While in Leningrad the cooperative efforts between the United States and the USSR had reached a significant stage in cooperation in space with the linking

up of the Apollo (USA) and Soyuz (USSR) space ships. Considerable publicity was also given in the Russian media to the cooperation ongoing in other areas.

Separate Attachment III is a copy of a Russian newspaper discussing cooperation in the electric power area with English translation. I was also asked to do an interview for Russian national television discussing our cooperative electric power efforts. (It was presented with English sound and Russian subtitles). Many other efforts were made by the Russians to publicize the cooperation developing.

Separate Attachment IV is a special cigarette package that was widely sold.

The Russian delegates were from two areas: universities and electric power systems. Cooperation was excellent, with discussions free and open. The Russians provided copies (in Russian) of the text books they used in their education of electric power engineers. These are included in separate Attachment V.

Information about their system, including a map showing existing and some planned facilities were provided. This is separate Attachment VI.

A second cooperative meeting was held next in the United States with the Russian delegates visiting several regions of the country and meeting many United States electric power engineers, most of whom were IEEE members. While these cooperative efforts were terminated with developments that caused confrontations in other areas, they established many contacts between the USSR and the United States IEEE members that led to future friendships.

Visits to Other Nations

While CIGRE and the United States/USSR cooperation efforts provided the many contacts, there were other international activities at which I presented lectures or became involved, as follows:

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| 1974 | Chaired the session on hydrogen at World Energy Conference in Detroit |
| 1977 | Presented a paper on energy storage at the World Electro Technical Conference in Moscow |
| 1978 | Prepared a report for the U.S. government on the blackout of all of France with the cooperation of the EDF engineering staff |
| 1980 | Direction of a study of possible cooperation between the United States and Mexico in the development of electric power systems and the exchanges of electric power at the border |
| 1981 | Lecturing in Venezuela at the International Congress on electric power systems |
| 1985/'87 | Various lectures on power pooling in Venezuela |
| 1990 | Presented lecture in Puerto Rico on electric power systems and government policies |
| 1990 | Presented paper on electric power transmission at meeting of IEE in London |
| 1991/'92 | Participation in discussions on electric power policies in Melbourne, Adelaide and Tasmania, Australia, including two radio interviews |
| 1991 | Lectures on economics of electric power systems at the University and to power system engineers in Budapest |
| 1993/'95 | Presentation on electric power policy and participation in discussions in Berlin, Germany |
| 1993 | Presentation of paper on electric power policy at UNIPEDE meeting in Tunisia |
| 1994/'97 | Lectures in Costa Rica on electric power policy in 1994 and as part of an IEEE meeting in 1997 |
| 1994 | Meeting with ENEL in Rome, Italy to discuss common problems |
| 1995 | Lectures on electric power systems, economics and policies in Slovenia, Budapest, Hungary, and Bucharest, Romania |

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| 1995/'96 | Lectures in Rio de Janeiro and Belo Horizonte, Brazil |
| 1996 | Participation in discussion of electric power policy in Buenos Aires, Argentina and assistance in drafting legislation |
| 1996 | Presentations on International power exchange practices and system planning in Minsk, Belorussia |
| 1997 | Attendance at meeting of European commission for electric power policy for Europe, Brussels, Belgium |
| 2000 | Lectures on electric power in Accra and Kumasi, Ghana as part of an IEEE group |
| 2000 | Copenhagen, Denmark lecture at University on electric power policy |
| 2001 | Several lectures at Sharif University in Tehran as part of an IEEE group. This was a 10-day trip that included trips to Isfahan and Shiraz to discuss Iranian history and technology. Jack Casazza met with the Board of Directors of the Iranian National Power System and was interviewed on Iranian TV. The Iranian Students presented as a gift a copy of the writings (in English) of Fazlollah Reza, a famous Iranian electric power engineer (Separate Attachment VII). |
| 2004/'07 | Presentations in El Salvador on electric power systems, planning, operating, and national policies. |

These international contacts lead to considerable interest in the IEEE electric power activities and subsequent participation in IEEE activities.

List of Separate Attached Material

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|-----------------------|---|
| Attachment I | United States/USSR papers presented in Russia in 1975 |
| Attachment II | Books describing Russian electric power facilities and systems (a gift of Professor Venicov) |
| Attachment III | Russian Newspaper discussion cooperation in electric power area with English translation |
| Attachment IV | Package of Russian cigarettes celebrating the Apollo/Soyuz link up |
| Attachment V | Russian electric power engineering text books |
| Attachment VI | Map of Russian electric power system and plans in 1975 |
| Attachment VII | Book with writings of Fazlollah Reza, a famous Iranian electric power engineer with some English translations |

The Engineer's Role in the Energy Crisis

By JOHN A. CASAZZA

NEVER has mankind needed new technology more than at present. What is the engineer's role in meeting that need? The value of engineers does not seem to be appreciated in solving our energy problems. Government and corporate positions are filled by persons who are not technically trained. As a result, the opinions of engineers too often fail to find their way into the decision-making process. What is the cause of this phenomenon? Are the engineers at fault? Have they failed to change as society's needs have changed? Or have the new forces which have come into play failed to recognize the role of engineers? What will be society's future problems? How can engineers help to solve them? Let us explore these questions.

Needed — Basic Philosophy

The bedrock foundation supporting the use of any



John A. Casazza is vice president of Stone & Webster Management Consultants, Inc. From 1974 to 1977 he was vice president (planning and research) at the Public Service Gas and Electric Company where he began his career in 1946 and served in numerous capacities. His executive duties have included responsibility for forecasting, development of expansion plans, economic and financial evaluations, research and development, and merger studies. **Mr. Casazza** graduated from Cornell University with a BEE degree and is a professional engineer.

profession's technical skills and knowledge is its philosophy and beliefs. Have our engineers and

The author depicts with evident dismay the phenomenon of engineering talent being "ground up in the eddy currents" of regulatory paperwork and bureaucratic hearings — which he sees as serving little useful purpose. The general public cannot afford two competing management systems for every large public utility system, which is what we have now, he says — a management authorized by the owners, and regulators who are fast usurping the role intended for the former. The article provides a thoughtful description of the rightful role of the engineer in a free society. The ideas expressed are those of the author and are not necessarily endorsed by any organization with which he is now, or has in the past been, associated.

managers ever tried to outline our professional "axioms"? While they have prepared codes of ethics and statements covering conflicts of interests, these have been concerned mostly with the conduct of day-to-day activities — not their obligations to society. How do they justify their professional existence? How do they justify their share of society's goods, services, and wealth?

I would like to suggest the following "twelve professional beliefs and precepts" for use in our engineering and managerial decisions:

- 1) The welfare of future generations is of vital con-
- PUBLIC UTILITIES FORTNIGHTLY—FEBRUARY 16, 1978

cern and must be protected, even at some expense to the welfare of our current generation.

2) People are fundamentally good and wise. The public is concerned about its future and, given the proper information, will react over a period of time with wisdom and justice.

3) The resources of this earth — natural, human, and capital — are limited and must be both conserved and used wisely, recognizing their great value to humanity.

4) The world's three major problems relate to food, energy, and land use, the solutions to which are closely coupled.

5) The benefits that technology has produced from the earth's natural resources are not widely realized. A peaceful mechanism to accomplish some redistribution must be found.

6) The technical and social systems that are most in harmony with the systems of God and nature are the best, recognizing that the welfare of human beings ranks higher than the welfare of lower creatures, and health before the visual amenities.

7) Our energy systems have great inertia, requiring evolutionary solutions to our problems which can be retrofitted into our existing systems and organizations while these are kept working.

8) Total system long-range incremental costs and benefits, including social costs, should be evaluated in making *strategic* decisions, without the distortions of man-made pricing policies, rules, and regulations on these economics.

9) We in the professions, both in business and in government, are the custodians of the public welfare and must provide the conduits and mechanisms through which the public's funds (customer's, stockholder's, and taxpayer's) are directed for their maximum benefit.

10) In a democracy, people vote in two ways: at the ballot box and with their dollars. Their choices in the use of their money can be far more important in determining our national future than their selections at the ballot box.

11) The optimum size process, plant, governmental unit, or business organization is one in which the benefits of the economy of scale are balanced by the benefits of the motivation and pride of those who will be responsible for its success. People must be able to see, understand, and be proud of their contribution to their community, their associates, and mankind.

12) Any form of energy conversion and distribution involves risks to human beings. These risks must be evaluated against the risks of not making the energy conversion and distribution. The overall welfare of all humanity, not of any one area or region, should govern.

Problems of Society

Increasing Lead Times

A major difficulty in achieving solutions to our energy

problems is the trend toward rapidly increasing lead times; i.e., the time between a decision to embark on a certain project and its completion. The significant lead-time increases result mainly from decisions on engineering matters being taken over by others who do not have the knowledge of the engineer. While engineers need to recognize the importance of having public input into the decision-making process, they need to oppose vigorously the assumption that engineers are not capable of evaluating the overall public welfare.

Regulation versus Management

Utilities are subject to a great deal of regulation, some of which borders on the takeover of management responsibilities. While regulation is necessary and justified, it is very important that the regulators not confuse their regulating responsibilities with the management of these organizations. Conversely, those in management need to recognize that good management works for what is best for the consumer — not just the stockholder — in the long run.

The amount of engineering talent presently being ground up uselessly in the eddy currents of regulatory paperwork and bureaucratic hearings is exceedingly damaging to both society and the engineering profession. The general public cannot afford the two competing management systems we are moving rapidly towards; namely, the duly authorized management and the regulators who feel they cannot fulfill their role or ambitions without actually participating in the company management.

Government Planning versus Private Enterprise

The major issue is the role of government planning versus the role of private enterprise; i.e., the conflict between political control and ownership. Some look at it as socialism versus capitalism. There are those who argue that in order to optimize from a long-term national basis, it is necessary for government to make the key decisions. Those who feel this way look at our energy crisis as a national emergency for which we need a military approach — some form of martial law to dictate what various enterprises and individuals should do to provide for our national welfare.

In deciding who should make the key decisions in our country, we need to recognize that people are people. The leader of a consumer movement or an advocate of citizen's rights can become just as ruthless a demagogue in the pursuit of his ambitions as the executive of a large company or a government official.

Freedom is the ability to decide for ourselves the things that affect each of us. We recognize, however, that for the benefit of the majority we have to give up certain freedoms and have done so when in our overall interest. The key issue is how much of this freedom should be given up in the energy area in order to achieve the benefits that we all want.

The conflicts between the rights and prerogatives of

various government groups in our country have been harmful. There is strong competition between the government of the community, of the state, of the region, and of the nation, and between the departments of each of these, for the power to make decisions that affect their respective areas. These conflicts have played a large part in the continually increasing lead times that we have been experiencing.

Role of the University

In this management-government situation, the role of the university should continue to increase. However, there is strong temptation on the part of some university people to adapt an anti-industry stance, designed to curry favor with government and so-called "consumer" groups. The irresponsible statements to the media of some university people are a major concern to industry and costly to the public. I believe an approach that could increase the constructive role of the university tremendously would be an impartial attitude toward the problems of society in the energy area. This role could be filled by having the universities serve along with the professional societies as a source for accurate and unbiased information. Such an approach would fill an aching void in our society.

Distribution of Limited Resources

Capitalism has been the most efficient producer of goods in the history of social and governmental systems on this earth. However, it has shown some weaknesses in the equitable distribution of resources when they are limited. A major challenge to private enterprise in the future is to improve the distribution of increasingly scarce resources while continuing to maintain its historically high degree of productivity. If private enterprise is not able to improve markedly its ability to conserve and optimize the distribution of scarce resources, the shift to government control of more and more activities will continue to accelerate.

Need for Results Now

A major problem confronting us is the problem of producing results "now." Government officials who regulate industry, the executives who work for industry, the stockholders, and the customers of industry want results now. Many do not willingly accept solutions which will penalize them now, even though they may provide more than compensating benefits later.

For example, the average age of stockholders in a typical utility is around sixty-five years. These stockholders do not want current dividends curtailed so that the company will be in a better position to provide for its customers twenty years from now. The people in elected government positions are not inclined to put great stress on programs that will bring improvement two administrations down the road. Executives are con-

cerned about the record and performance of the company while they are in charge. This results in the solving of 20-year problems with a four-year perspective. In spite of the obvious difficulties, private enterprise has to achieve a mechanism for long-term optimization if it is to survive.

Growth in Pension Funds

Another significant development that will play an increasing role in the future is the very significant increase in the percentage of our national capital that will come from pension funds. We have seen this recently in the case of New York city.

Presently, pension funds provide one-third of our nation's equity capital. By 1990 they will provide two-thirds of the equity, plus major portions of the debt capital. What will be the impact of this change? How much control will be exercised by the workingman? By labor leaders? By banking institutions? It is vital that control be by those responsive to the overall, long-range welfare of our society.

Energy, Food, Water, Land Use, and the Environment

We have too many partisans arguing for partial solutions to complex and interrelated problems. There is a strong coupling between mankind's need for energy, food, water, land use, and a good environment. Approximately 85 per cent of our fertilizer is produced from natural gas. Cooling towers used to keep down water temperature at power plants can consume considerable amounts of water, which will be needed in the future to increase our potable water supply. Water is also needed for hydroelectric generation. The impact of the recent droughts in California on food supply, drinking water, and energy supply illustrates this dramatically.

Need for Price Signals

A nation in which private enterprise is to continue to make its benefits available to the people must also have a pricing system whereby the proper price signals are given to the public so it will choose the optimum energy courses of action in the long run. This can be done only if pricing reflects long-term total system incremental costs. Essentially, pricing should be in proportion to replacement costs. This can be achieved in the private enterprise economy through enlightened government regulation.

"Man-made" versus "True" Economics

The "true" economics of energy are frequently camouflaged by man-made rules and regulations. We use taxes, subsidies, and political considerations as prime factors in establishing prices. A good example is

provided by the utility commissions throughout the country, which often establish prices for various types of services based on political considerations; i.e., the impact on the next election. They have not generally been concerned with giving the general public the proper price signals.

We need to recognize that we cannot make long-term strategic decisions based on the arbitrary "man-made" component of our costs, such as subsidies and taxes. We need to recognize that these man-made inputs can change with changes in administrations, changes in individuals, and changes in the public mood.

Incremental versus Average Costs

In economic evaluations and decisions we need to use true incremental costs, recognizing the future costs to obtain additional coal supplies, additional oil supplies, additional uranium, or solar collector devices, etc. We also need to recognize that we are in a new era. Not only is our society capital-limited for the first time in the lives of most of us, but we are in a period where incremental costs are higher than average costs.

In the past, as our nation grew and built new facilities, our incremental costs for the output from the new facilities were lower than our average costs, causing an overall lowering of prices when the new facilities were "rolled into" the economics. This is no longer true, not only for our electric systems, but also for our gas systems, oil systems, nuclear fuel systems, transportation systems, land development costs, city development costs, and throughout our whole economy. As a result, most businesses are not accumulating sufficient capital to replace existing plants and equipment when they are no longer useful.

Role of the Professions

In recent years there has been a significant increase in the number of technical decisions being made by lawyers, politicians, and accountants. Engineers have stood aside and watched these other professional groups assume many responsibilities and duties which they are best qualified to meet. The Congress of the United States has had the General Accounting Office investigate such things as the safety aspects of liquefied natural gas tanks and the need for additional electrical interconnections, and engineers have not objected. Hearings in progress in many areas of the country comparing technical alternatives are run by technically untrained individuals, with final decisions being made by lawyers.

The typical approach in hearings to decide highly technical questions is similar to the approach used in criminal and civil proceedings; namely, to discredit the opposing side's witnesses, attack their credentials, and try to trap them into contradictions. The hearings have not been getting at the basic issues involved, the basic reasons for the differences in technical testimony, not because they do not wish to do so, but because they do not know how! It is discouraging to sit at these hearings and, for example, hear the question: "What is a

logarithm?" and then hear an hour of cross-examination on logarithms. Such procedures are extremely wasteful of the public's money and, more importantly, of our professional talents.

The System Approach

Coupling between Systems

In deciding on energy strategy and tactics, engineers need to look at the overall "system." We cannot continue to optimize our electric systems, water systems, and transportation systems separately. We need to consider food and land-use requirements in order to find optimum solutions from overall viewpoints. In deciding how to use our coal we need to evaluate carefully its use for the production of liquid and gaseous fuels, its use for the production of electricity, and its need as a petrochemical feedstock by future generations.

Inertia of Energy Systems

In examining the future of any new energy source, engineers need to consider fully the "inertia" of our energy systems. What will the capital requirements be to retrofit new technology into existing buildings, homes, and factories? Answers to the optimum use for new technology cannot be obtained by looking at their cost alone. We need to look at their impact on our total resources — natural, capital, and human — with particular emphasis on our ability to use them in existing structures.

Standards of Risk

We all recognize that uncertainties in the reliability of our future energy supplies are increasing. It will require more of our resources and cost more to provide "insurance" for these uncertainties in the future. We have to determine and agree on acceptable standards for future occasional shortages in all energy supply systems. This will increase the use of probability techniques for analyzing our uncertainties and system characteristics to decide how much redundancy is needed, and what quantity of reserves is justified.

Rewards for Provisions for Contingencies

In order to provide needed motivation, we must devise systems whereby those who have contributed a portion of their current income and wealth to provide for future contingencies are not forced, without adequate compensation, to give these benefits to others who have not so provided. At the present time there is little incentive for utility companies to provide for potential uncertainties and shortages. When we have an unexpected gas shortage, those who have provided adequate gas supply and adequate gas storage are forced to share it with those who have not. Ditto for oil shortages.

While recognizing the importance of the welfare of the overall region or nation during times of shortages, a mechanism must be developed for compensating those who, at their own expense, have provided the reserves that are used by the entire region in these emergencies. It is essential that those who use the reserves of others pay more than their costs. This is necessary because there will be many occasions when costs are incurred to provide reserves which are not used. In the long run, such a pricing arrangement should lead to much greater incentives for private enterprise, by its own free choice, to provide for uncertainties in the future.

Possible Solutions

In conclusion, I would like to provide a few specific suggestions for solution of our energy problems:

Global perspective. We need to recognize the international and interregional interdependence that exists. The mentality of self-sufficiency is no longer tenable. Our world problem is not so much the shortage of resources, but the inadequacy of the system that manages and distributes them.

Pricing in proportion to incremental costs. The proper price signals must be given to the general public. In general, prices should be *proportional* to long-range incremental costs, including depreciation charges based on replacement costs.

Increase energy efficiency at utilization points. Significantly increased attention should be placed on improving energy efficiency at utilization points. Significant additional capital expenditures are justified to improve efficiencies, to reduce losses, and to use heat that is presently wasted.

Technical jury of peers. The professional societies should establish panels from which juries of peers may be selected by the courts and regulatory agencies for

reviewing and making decisions on complex technical matters. We need to work vigorously to set up new democratic processes in which peers are used as judges for complex technical issues. Only those with the technical expertise required can render the fair and impartial evaluations on such issues. Certified public accountants should judge accounting questions; lawyers, legal questions; engineers and scientists, technical questions; and economists, economic questions. In cases where disagreements extend across several of the professions, a panel including the proper expertise from each profession should be involved in the assessment procedure.

Industry, government, and university consortiums. The adversary positions frequently taken between industry, government, and universities are not in the public interest. We must attempt to develop improved working arrangements between the three principal branches of our society so they may work together in areas in which they have common objectives.

Use existing organizations. The organizations that presently exist in our society provide effective teams for use in solving our problems. Whenever possible, we should try to make use of our existing institutional arrangements rather than establish new ones which can only function by robbing the existing organizations and institutions of their manpower. Our skilled human resources are scarce and we can usually make the best use of them by not destroying the organizations in which they presently perform.

Improve communications. We in the professions and management must become personally and regularly involved in communicating with the public. Personal appearances before religious and youth groups will be particularly valuable. We should work with the media representatives, and in many more cases we should work for newspapers, magazines, and television on a part-time basis.

State's Solar Program Called Unimpressive

A \$100,000 program of Governor Edmund Brown's administration in California to install solar systems in some state-owned buildings and provide job training in the process has had unimpressive results, the *Sacramento Bee* reports.

None of the six installed solar systems was working and only one-third of the project's trainees had obtained jobs in the solar field, the *Bee* found in late December, 1977.

The solar heating system installed at the governor's apartment building across the street from the state capitol had to be shut down because of technical flaws, as did the others. A variety of wires, vents, pipes, and insulation were incorrectly installed, causing months of delay and faulty operation.

The project's former director, Jo Ann Trujillo, who was no longer in state service, contended that Brown administration officials were more interested in gaining attention than in schooling jobless men and women in solar techniques.

The 12-month project, financed by federal job funds funneled through the governor's office, ended last September.

But the state architect, Sim Van der Ryn, who supervised the project, said it was not a failure. "We were trying to push too fast," he said. And he added: "We put solar on the map."

**Technical Competence, Engineering Leadership and
Electric Power**

Presentation by J.A. Casazza
Life Fellow Institute of Electrical and Electronic Engineers
Chairman of the Board
Casazza, Schultz, and Associates

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Technical Competence, Engineering Leadership and Electric Power

by J. A. Casazza

Societal Needs

For quite a number of years, I closely followed some of the work being done by the Center for the Study of Democratic Institutions in Santa Barbara, California.¹ This was an elite group of good minds from many professions and many different occupations ranging from college professors to a former TV talk show host. One of their assignments was to place themselves in the position of the founding fathers of our country and to write a constitution that would be equally good for the next 200 years. I became quite interested in their work and followed their successive drafts.

One key conclusion they reached was that our government structure had to be modified to recognize that our society had become a highly technical one. The founding fathers had written a constitution with great flexibility but with its roots in the agricultural economy and society of its times. Our constitution provides very little in the way of mechanisms for technical planning and the resolution of technical policy questions. They proposed that the new constitution include a fourth department to complement the existing legislative, executive, and judicial departments,--- a planning department which would establish the necessary technical policies. While such a drastic change in our government is obviously not feasible, I think we need to recognize that they identified a key weakness in our system of government.

Anti-Engineering Biases

Four hundred years ago in Italy, Galileo was appointed to the chair of mathematics at the University of Padua. Through his technical and scientific work, he concluded that the earth ^{circled the sun.} was round.

The authorities of his day deemed that this technical information was inappropriate to their objectives and they forced him to recant. Is this much different from the situation on the Challenger space mission where engineers reported that there were risks involved in the mission because of problems with the "O ring" in cold weather? The NASA administrators paid little attention to this technical information. They did not even take the time to find out if these technical claims were valid or whether the risks were significant. The net result was that seven fine young astronauts died.

This anti-technical bias is continuing in connection with the development of electric power policy. Those with the technical knowledge and expertise in these systems, their costs, and their economics are not only being ignored, but are being suppressed. Many in our government have a strong bias against engineers. They show their bias in almost everything they do. Sometimes the biases are flagrantly obvious. Sometimes they are subtle. Recently, at a large public meeting, a high-ranking state government official offered the put down "You can't be an engineer because I don't see a plastic holder and colored pencils in your shirt pocket." All engineers should resent this sort of stereotyping.

Most of my career has been spent developing electric power systems and policies. In the last five years, I have seen this anti-technical bias rise to the point where I felt action must be taken to correct it. While I have tried to take vigorous action when the opportunities were available to me, I realized that I was dealing with a long-term problem for which long term corrective action was needed.

Some discussion of the way this anti-engineering bias is shown should be mentioned. All lawyers know that if you can select the jury and the judge, you will get the verdict you want. At federal hearings in Washington, both legislative and regulatory, the government staff involved in making the selections of those to testify have shown distinct biases against engineers. They prefer groups that profess to represent the public interest but in truth represent a privileged class whose main goal is to perpetuate their own existence. The White House Selection Commission for selecting Congressional Fellows in

1990 had five lawyers and one engineer. The scarcity of engineering appointments to key government positions is astounding. A lawyer was appointed to head up the development of energy strategy in the Department of Energy.

The selections made for key engineering advisory panels and boards in the Federal Government frequently have non-engineers as members. I can see the need for some cross-representation between the professions on advisory panels, and I do not object to having a lawyer or two or an economist or two on an engineering advisory board. I do ask for reciprocity. Why aren't engineers appointed to the various legal and economic advisory panels? Why aren't engineers sitting on the president's economic council? Why aren't engineers involved in reviewing nominations for the Supreme Court Justices? Why do lawyers confine to lawyers alone procedural questions related to their profession, yet participate, and in many cases dominate, the decisions on technical questions?

TV, newspapers, and magazines distort stories and totally misrepresent technical reports. Some excellent examples are the reports which were given to the American public about the health effects of EMF fields as reported in the recent U.S.C. study. Editors adjust and change letters for publication to remove key technical material under the guise that the readers will not consider it important. Even the IEEE press has technical editors who considerably alter and change the contents of material prepared by engineers, thus destroying its integrity.

In 1989 the Federal Energy Regulatory Commission issued an order² barring all engineers from making an evaluation of a trial of a new approach for the interchange of electric energy and use of electric transmission systems. These are areas in which engineers have worked for generations.³ The FERC did this under the guise that the key issues were economic and the only ones who could work on economic issues were economists! These biases against engineers are not significantly different from those that exist against blacks, women, and Hispanics, etc. in our society.

Possible Corrective Steps

Democracy will only work and the national interest will only be served if we achieve the necessary technical input and technical participation in setting our national and local policies. The purpose of this symposium is to explore ways to achieve this. The hope is that these efforts will be multiplied through wide distribution of the video tapes of the presentations and discussion.

I believe there are two groups we must target: Engineers in current practice and those who are being trained in our educational institutions. I would like to suggest some possible steps for consideration:

1. We need to work to change the present procedures. Engineers need to take an aggressive stance and speak out against such biases, even at personal expense and risk. As stated in the United Kingdom by Sir Monty Finneston, past Chairman of the Engineering Council and past Chairman of British Steel, "People like ourselves who advance civilization and its future cannot isolate ourselves from what is made from our professional efforts."⁴

In a speech to the USA National Academy of Engineers President Bush's Chief of Staff, John Sununu, stated⁵: ". . .it is now clear to virtually everyone that science and technology, engineering, are all very critical parts of developing policy and implementing policy at the national and international level. . .I stress this because what I am concerned about is that as a profession, engineers have been negligent in one very significant aspect. . .in their direct participation in the policy-making, policy-shaping, and policy-implementing process. . .And yet the fact is that we have been reluctant to get in and mix it up with the lawyers and others in the process. We have not just the right to do so, we have the responsibility to do so-. . . . And so

my plea today is that as a profession we understand our obligation. That as a profession, we communicate the need for that kind of participation. And on top of that, to suggest to you that not to be involved is really to miss something that is fun, that is worth-while, satisfying, gratifying, and back to the original premise, something that is absolutely necessary."

These statements provide an acknowledgement of the task. They do not provide the guts and energy necessary to proceed as they suggest. This can only come from individuals with the motivation and integrity to stand up and speak for what is right for this country; not just for what is right for a particular company, or industry, or profession (including the engineering profession). We must support the few who are speaking out. The entire profession, including our universities and our professional societies, should give them full backing when they do so.

2. We must encourage many more engineers to recognize their responsibilities and to speak out.

A recent example of the problem is provided by a recent IEEE publication. It had an article on ways to calculate the RMS value of a particular wave shape and an article on electric power policy. Six hundred and ninety-two letters to the editor were received on the RMS calculation article. None were received on the electric power policy article.

Our greatest problem is that engineers love their work. I once worked for a fine engineer who lived to build power plants, whether they were needed or not. Our universities have produced a generation of engineers who are in love with computers! These fine minds must somehow be helped to see their societal responsibilities too.

John Pope, President-Elect of the IEEE Power Society, is here on the program today to talk to you about the role of the professional society. My experience after forty years of working with

the IEEE is that it is very difficult to get engineers involved in anything outside of their narrow technical areas. This situation is being changed by the IEEE. The IEE in Britain also is moving in the direction of redirecting the focus of engineers.

3. We must recognize that there is some justification for the biases against engineers. I have seen many biases during my life. I have even known one individual who felt all people with gray eyes couldn't be trusted. In most cases, I also believe some past justification can often be provided for the bias. Perhaps we engineers need to see why the biases exist against engineers. Here is a good list of possible reasons:

- Their lack of knowledge of acceptable standards of behavior in business and government;
- Their poor understanding of the workings of government (including the increased need to use their analytical capabilities, such as those involved in flow charting, probability and statistical analysis, etc., in analyzing the operation of government.)
- Their lack of ability to educate and influence the general public.
- Their lack of a sense of responsibility, sufficient conviction and a desire to speak out on issues of importance, even at personal sacrifice.
- The narrowness of a typical engineering education.

4. We need to develop ways to get through to and influence the public, the government, and industry decision-makers with the needed technical information. We cannot do this with scholarly approaches. George Will, whom I greatly admire, has said that to get public attention, you must be willing to be sensational. You must learn not to back off from controversy. You must speak out loudly and clearly. We must recognize that the public uses its heart as well as its mind in forming opinions. Ways to alter peoples' perceptions are just as important as presenting technical facts.

5. Engineers must develop significant communication skills. They must be able to express their ideas in writing, and orally. They must understand that there are different audiences for which different techniques must be used. Corporate executives, government officials and the general public will not listen to boring intellectual treatises or review complex computer printouts. They don't have the time and often don't have the training. Engineers have to learn to get the story across quickly and effectively. Decision-makers want to know the answer, what alternatives you have considered, what assumptions you have made, and what the uncertainties are, and they want to know it quickly.

6. Engineering faculties need to provide better examples and leadership. In my contacts with universities and colleges, I have often seen a lack of professional responsibility. Faculty members are too often concerned with their research grants and their personal paychecks. The engineer has to be taught a sense of professional responsibility. How are they going to be taught this responsibility if their professors do not have it? A professional realizes his responsibility to others to get the job done well and to get it done on time. All too often faculty members say "That's not my job," or "That's not my responsibility, someone else is supposed to do it" and walk away and leave things undone.

Some of you are old enough to recall "Red" Blake when he was football coach at West Point. He developed a number of outstanding football teams. Admittedly, he had some fairly good players, but the key to his teaching was that you not only had to meet your responsibilities, but you also had to help others meet theirs. After his players made a block they would always keep looking for other opportunities to help, recover a fumble, make another block or to make a tackle. This is what I mean by professional responsibilities. Winning organizations have this sense of professional responsibility.

Engineers need better training in the management of their activities. Whether they are going to be top executives or not, they have to understand what it takes to get things done. If our engineering schools want to help engineers learn how to manage, they could spend more time in improving the management of their own organizations. I have been involved in making research grants to a number of different universities. I have found very few cases where I felt that the administration of the projects was effective and that the money was used to the maximum efficiency. Often I found sloppy administration and a failure to be "goal-oriented".

7. Engineering curriculum should be revised.⁶ The engineer must be trained in philosophy, history, geography, and politics. In the fall 1990 issue of *The Bent of Tau Beta Pi*, in an excellent article, by Samuel C. Florman states, "I can never forget the words of Eugene Ferguson, a noted historian of technology, who once said if we are ever going to liberalize the training of engineers and elevate their sights, we're going to have to kill off at least one generation of engineering faculty."⁷ Well, I am not here today to propose this as a solution. I do feel, however, that engineering faculties need to have fewer specialists and more generalists, people who are broad-based and see the need for training individuals to meet our society's future technical needs. They need fewer Ph.D.'s and more with "real world" experience. The excessive concentration over the past twenty years on the development of software skills and modeling techniques have set back the engineering profession considerably.

We also need to develop far more "system engineers" who can not only integrate technical systems but also societal systems, who recognize financial and environmental problems. I have participated in an international activity involving 17 nations on how to best influence public opinion in the electric power area.⁸ I would like to read a checklist to you which was developed by Nelson DeFranco, an electrical engineer from Brazil, who is involved in electric

power policy in South America for the World Bank. Here are the skills he thinks are needed by engineers.

1. Be able to identify the decision makers and how they actually arrive at their decisions.
2. Develop a set of alternatives, not concentrate on a rigid single recommendation.
3. Be prepared to respond quickly to changing conditions or a different set of players.
4. Recognize the importance of the various political motivations that are involved.
5. Establish an effective information system so as to be able to assess quickly the impacts of revised plans on the need for financing and on the cost of electricity.
6. Recognize that the funds required for the operation of the existing system and its expansion must be achievable, regardless of whether the system is publicly-owned or under privatization.
7. Develop a full comprehension of the regulatory system and the role it plays as a substitute for market forces in a country. Part of this effort should include participation in discussions of the changes needed in regulating procedures.
8. Involve engineers in the process of establishing tariffs in order to arrive at tariffs that will provide the proper signals to the consumers and provide the necessary funds for the functioning of the utility that will be established.
9. Be able to stress not only short-term consequences but real, long-term consequences of alternative projects, tariff schedules etc.
10. Recognize that attempts might be made to have the electric power system meet social objectives, particularly to help the poor. In these situations, the possibility for having direct government funding for these purposes should be encouraged.

Engineering, Leadership and Electric Power

As some of you know, I have a strong interest in electric power. I, and many others, have been deeply concerned about many policies I have seen proposed for the USA.^{9,10} These policies are being proposed without analyses by individuals lacking an understanding of the technologies involved. They are based on the unreasoned application of political and economic philosophies to a very complex technical system. These individuals do not even know what questions need to be asked about the effects of these policies. They claim that those who raise vital questions "are raising a technical fog so dense that no mortal can penetrate it".¹¹

I will not get into the details, but I will point out what is happening in the United Kingdom where changes were made that are similar to some being proposed in the USA. Excess generating capacity is being installed. Costs of electricity have gone up 20% to 40% in one year.¹² Planning for future electric power requirements has become impossible. There are those in the USA who are trying to get us to follow the same policies. Recently I have seen judges, legislators, regulators, and utility executives make decisions and propose actions which completely ignore technical facts. The most disheartening part of this situation is they don't care to have technical and economic information that might sway them from their political course.

A Request

In closing, I have only one request. Listen to the presentations at this symposium. Try to learn more. I have provided some references for further reading. Whatever your resulting views are, become an activist in helping the engineering profession fulfill its needed role. Become involved in the current debate on our future electric power policy. Help in the development of coordinated technical and institutional solutions. The future welfare of our country depends on it.

I would like to close with a few brief words on why I decided to establish the Peter Cooper Fund for advancing Government competence. I felt a personal obligation to try to:

1. Repay Cooper Union for the outstanding education it gave me.
2. Provide a "seed" which hopefully would grow to improve technical leadership nation wide.
3. Provide a personal example demonstrating what I am preaching.

I have also decided to forego my salary at my company, leaving these funds in the business to support vital unpaid professional activities by our staff. I am finding people will listen when this kind of an example is set.

If any of you in the audience would like to contribute to the Peter Cooper fund, I am sure Dean Baum will be glad to hear from you.

Thank You

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9. JAC talk in Toronto: "What We Can Learn From Others", November 17, 1997
10. Kentucky COOPS Luncheon Talk, 1999
11. JAC lecture CIGRE Colloquim, 2001
12. Tampa Electric Talk (two tapes), December 1, 1999
13. Buffalo IEEE Talk (two tapes), 1999
14. IEEE Talk at NJIT, April 2000
15. Howard University Talk, April 2000
16. Small Customers Talk NARUC Annual Meeting, November 2001, Philadelphia, PA

ATTACHMENT ④

THE WHITE HOUSE
WASHINGTON

January 11, 1990

Dear Mr. Casazza,

I have read with interest your letter concerning the shortage of engineers and technically trained employees in government service.

I wanted to thank you for the generous actions you have taken to alleviate this dearth. Hopefully, your initiative will encourage others to become involved as well.

With all best wishes for 1990,

Sincerely,

A handwritten signature in black ink, appearing to read "John H. Sununu". The signature is fluid and cursive, with a large initial "J" and "S".

John H. Sununu
Chief of Staff

Mr. John A. Casazza
8208 Donset Drive
Springfield, Virginia 22152



(JAMES FLETCHER WAS
HEAD OF NASA)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546



RECEIVED

REPLY TO
ATTN OF:

JUL 24 1974

OFFICE
VICE PRESIDENT
PLANNING AND RESEARCH
JUL 18 1974

Mr. Jack Casazza
General Manager
Planning and Resources
Public Service Gas and Electric
Company
80 Park Place
Newark, N.J. 07101

Dear Mr. Casazza:

On behalf of Dr. James C. Fletcher and myself I wish to thank you for your frank and informative discussion at our July 10, 1974, meeting on the role of fuel cell technology. I also appreciate your willingness to continue to cooperate in the delineation of an appropriate government role in this program area.

The next meeting of our ad hoc fuel cell group will be on July 30, 1974. I believe that this date has been found to be satisfactory with your schedule. As we previously decided, at this meeting I hope that we can review the following items:

1. A draft outline of a program plan for a NASA research and technology effort related to alternative fuel cell system and subsystem concepts (NASA action).
2. A draft or drafts of a letter which would state the case for federal involvement in commercial fuel cell technology (Bob Bell action).
3. Possible individuals who can present the case for federal involvement to appropriate administration officials and are willing to do so (Group action).
4. Steps to be taken to further explore and present the case for a fuel cell program (Group action).

Our action with respect to the first item is progressing well.
I am looking forward to discussing it with you on the 30th.

Sincerely,



Harrison H. Schmitt
Assistant Administrator for
Energy Programs

HARRISON SCHMITT

IS THE
GEOLOGIST

WHO WALKED ON
THE MOON
IN 1972[±]



JIMMY CARTER

February 15, 1994

To John Casazza

Thank you for sending me a copy of The Development of Electric Power Transmission. I look forward to reading it and appreciate your thoughtfulness in remembering me.

With warm best wishes,

Sincerely,

A handwritten signature in cursive script that reads "Jimmy Carter".

Mr. John Casazza
8208 Donset Drive
Springfield, Virginia 22152

JAN 10
March 10, 2009

President-Elect Barack Obama
Office of the President-Elect
Washington, D.C.

Dear President-Elect Obama:

I am 84 years old and have spent my life in the electric power industry working as an engineer, executive, board member and educator. The purpose of this letter is to help in the many vital decisions that must be made in developing our future electric power and energy policies by offering my views. My qualifications are summarized in the attached sheet.

I have been deeply concerned with the lack of technical competence in the United States Government and in the board rooms of our electric power providers. Some of these concerns are summarized below:

- Over the past 20 years decisions about the electric power industry have been dominated by the legal and economic professions. The roles of the engineers and scientists have continually declined. I urge that when considering key appointments to the FERC, DOE, and other government agencies a number of technically qualified individuals who have had experience in the planning, operation and design of our complex electric power systems be selected for leadership positions.
- Our power systems have an aging infrastructure and require considerable reinforcement. A major question is how best to use the facilities and systems that currently exist. Only technically qualified individuals can be given the responsibility for making these policy decisions. Closing existing power plants and building new generating facilities powered by wind, other renewables, and nuclear and the transmission lines needed to support these facilities will cost hundreds of billion dollars.

In addition, the nation has policy questions such as should we electrify our railroads? How should the electric power system be used to reduce our use of petroleum? How can we best solve our climate problems. In this time of deregulated utilities, these decisions rely on market forces.

Market forces are best at creating an opportunity to profit and not the achieving a "public good". Can we trust the health of our nation to market forces? Should we turn back from the emphasis on corporate profits to engage again the obligation for the utility industry to serve the public good? It would also shift the accountability from the market as a means of discipline to the government.

- The growing lack of technical competence has also dominated decisions made in the boardrooms of our major electric power providers and systems. Compensation arrangements for the company officials and executives have heavily stressed the generation of profits. The role of engineers in policy decisions has continually decreased.

In many states licenses are required for those whose work affects the public health and welfare, particularly engineers. Certainly many decisions made in the boardroom can have such an effect. Why not develop legislation requiring that a certain percentage of board members have the required technical experience, perhaps a required license?

- Other nations, particularly China, are moving forward far faster than the USA in developing the power systems and the technology that are needed in the future. The Chinese are electrifying 75,000 miles of railroads and installing 1,000-kv AC transmission and a considerable amount of DC transmission. This effort in China is being guided by overall national studies. We need another national power study similar to those that made under Joseph Swidler, Chairman of the Federal power Commission (the predecessor of FERC) in the 1963-1964 period. I have therefore attached a copy of a proposal that I made at Carnegie-Mellon in 2007, suggesting a procedure for a new power survey to develop the technology and systems we need in the future.

I have also recently completed a book which discusses how the engineering profession and the government could cooperate and coordinate for the benefit of all consumers and the nation as a whole. The book has been translated into Japanese and is being used in Japan as a basis for reviewing the role of its engineers in meeting their societal obligations. A copy of this book is enclosed with this letter.

I hope and pray that these comments will reach you or someone who will inform you about them.

Sincerely,

Jack Casazza

IEEE Life Fellow

Cc David J.Hayes, Elgie Holstein, Sue Tierney, Rose McKinney-James

Jack Casazza
CSA
Arlington, Va

File w/
Cooper Union
talk.

Dec. 4, '91
CSA, INC.
DEC - 6 1991
JAC

Dear Jack

I have just read your talk on Engineering leadership, presented yesterday at Cooper Union. It is one of your best, a real corker. Rarely has any engineer, since Galileo, at least, spoken with the passion and erudition of your talk.

You must have received an ovation at Cooper Union. Now comes the tough part, how do we get from here to there? You can't carry the whole load yourself, although you try. Perhaps we can talk about this when we meet again.

Joe

PERSONAL NOTE FROM MR. JOE SWIDLER
(FORMER CHAIRMAN OF THE FEDERAL POWER COMMISSION
(FORMER CHAIRMAN OF THE N.Y. P.S.C.)
(FOUNDER OF SWIDLER & BERLIN LAW FIRM)

SWIDLER & BERLIN

CHARTERED
3000 K STREET, N.W.
SUITE 300
WASHINGTON, D.C. 20007-3841
(202) 944-4300

JOSEPH C. SWIDLER
ATTORNEY-AT-LAW

DIRECT DIAL
(202) 944-4319
TELEX: 701131
TELECOPIER (202) 944-4296

March 30, 1989

Ms. Maureen Quinn
Secretary of the Awards Board
IEEE
Awards Department, 10th Floor
345 East 47th Street
New York, New York 10017-2394

Dear Ms. Quinn:

It is my great pleasure to endorse the nomination of John A. ("Jack") Casazza for the 1990 Herman Halperin Electric Transmission and Distribution Award. I have dealt with scores of outstanding electrical engineers in the course of my career, which included service in TVA and as Chairman of the Federal Power Commission and the New York State Public Service Commission, and there is none for whom I have a higher regard than for Jack Casazza.

What has impressed me most about Jack, because it is close to my heart, is his dedication to the goal of making the best use of the transmission networks for the purpose of optimizing the performance of the generating plants on the grids, and of building additional transmission to the extent of the economic potential to increase these benefits. These were the principal goals of the National Power Survey conducted by the Federal Power Commission during my tenure.

The general public and even many technical people in the industry are not fully aware of the benefits which have resulted from improvement in transmission network performance in the United States since the National Power Survey Report was published in 1964. By finding ways to measure the magnitude of these benefits, Jack Casazza has encouraged both the more effective use of the transmission networks and the construction of network additions. More than to any other man, the electric consumers of this country owe a debt for showing the way to reduce costs and to reduce the need for new generating capacity by using the transmission networks to best effect.

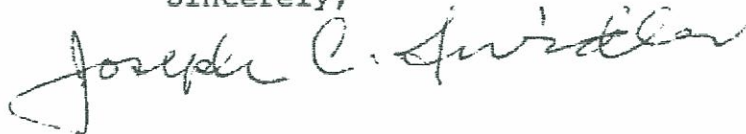
To Jack Casazza, the quality of performance of the electric power industry is not merely a matter of professional interest, but one of deep conviction. Alone, I believe, among all electrical engineers, he has addressed the Federal Energy Regulatory Commission, both in writing and personally, in an effort to ensure that the FERC's proposals for industry reorganization do not fail to take account of the underlying realities of the industry. He has done this as an individual, on his own behalf and not on behalf of any client, and at his own expense. He has done so as an engineer.

The engineering profession has an eloquent and effective spokesman in Jack Casazza. He has striven repeatedly, before the FERC and in industry publications, to emphasize the importance of relying on engineering facts as the foundation of plans for industry reorganization or restructuring.

Jack Casazza's achievements have won wide recognition. He is a member of the Board of Directors of the U.S. Committee of the World Power Conference, and a leading member of the U.S. delegation to CIGRE. His efforts were crucial in helping the NERC to establish a capability for the measurement of actual and potential transmission line performance, and in developing EPRI's capability for on-line determination of the uses of transmission facilities.

I leave it to others to appraise his technical contributions to the industry in the scores of papers he has written and in the seminars and conferences he has addressed. Rather, I have limited this letter to his achievements in the areas of which I have personal knowledge. On this basis alone, I believe the Halperin Award would be an appropriate recognition for the contributions he has made in the planning, use and development of transmission networks, and in advancing the interests of the engineering profession.

Sincerely,

A handwritten signature in cursive script that reads "Joseph C. Swidler". The signature is written in dark ink and is positioned below the word "Sincerely,".

Joseph C. Swidler

JCS:rc

CSA, INC.

DEC 28 1989

SWIDLER & BERLIN

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SUITE 300
WASHINGTON, D.C. 20007-3841
(202) 944-4300

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 RAW
 FILE:
 SEC
 HDL
 MKT
 RES
 JOB
 TOSS

DIRECT DIAL
(202) 944-4319
TELEX: 701131
TELECOPIER (202) 944-4296

JOSEPH C. SWIDLER
ATTORNEY-AT-LAW

December 22, 1989

*AB to check possibility of a magazine article
jac
1/5/89*

Mr. John A. Casazza
President
Casazza, Schultz & Associates, Inc.
Suite 503
1901 North Fort Myer Drive
Arlington, Virginia 22209

Dear Jack:

The testimony on National Energy Strategy which you and Allan presented to DOE on December 13 is one of CSA's best reasoned and most articulate papers, and I congratulate you both. I have a number of suggestions to make, but they do not derogate what I have just said. Rather, the paper is so comprehensive and well-organized as to stimulate thinking about what might possibly be added that would be of help. In this vein, I suggest a few general topics and a number of specific additions. I realize that the testimony has already been filed, but it may serve as a basis for future testimony or papers; and you have asked for comments.

Among the topics which seem to me to invite additional attention:

- o A switch from regulation to competition may be irreversible. The utilities may not possess the same lobbying skills as representatives of private interests. A change from regulation to competition may be accomplished regardless of merits because an NUG industry lobby already exists and is at work. If a transition should take place, much stronger vested interests would be created and it is doubtful that the country would be able to reverse its course.
- o A deterioration in the electric supply situation has already occurred as a result of the introduction of competition on a haphazard basis. The opportunity for above-market returns

option and, above all, on the nation's ability to shape its destiny insofar as power supply is concerned, when the industry is dominated by competitive entities.

- o In the penultimate paragraph on page 6, add something like "It has also reduced the risk of blackmail by fuel suppliers and of labor disturbances so protracted as to threaten reliability."

- o In the last paragraph on page 6, in lieu of the words "storage capacity," insert "industry storage capacity standards".

- o At the end of the last full paragraph on page 7, add:

Moreover, the ability to apply the standard of what is best for the interconnected systems as a whole may yield to protection of IPP plants.

- o In the first full paragraph on page 8, add at the end of the first full sentence, following a comma:

by making competition the norm? Competitors do not cooperate with each other.

- o In the first paragraph under the heading "A Recommendation," change the third line to read:

change should be greeted with caution, because changes will create strong vested interests and may be irreversible.

And insert this new sentence after the third sentence:

They do not cover cycles in fuel costs and availability, nor cycles of prosperity and recession in the U.S. economy.

- o At the end of the first sentence of paragraph #1, following a comma, add:

and do not distinguish between competitive industries and the electric power industry, which does not function on a competitive basis anywhere in the world. England is moving in that direction, but in a carefully planned way and with many misgivings among experts.

Letter to Jack Casazza
December 22, 1989
Page 4

- o The last sentence in the same paragraph should read:

The type of investigation needed must be conducted objectively and judicially, by judges who are not players.
- o On page 10, change question 18 to read as follows:

To what extent is it desirable to increase the amount of competition that exists in the electric power industry while furthering these long-range objectives?
- o Add a 20th question:

How can we insure that responsible companies or agencies will build capacity as needed?

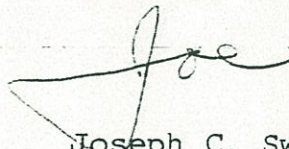
And in the last sentence on the page, after the word guidelines, add:

"-- not plans --"

I hope you will find these comments useful.

A Merry Christmas to you and your family, and a happy, healthy, and prosperous new year.

Regards,



Joseph C. Swidler

JCS:rc

EDWIN H. SNYDER
23 TWOMBLY DRIVE
SUMMIT, NEW JERSEY 07901

1/9/82

Dear Jack:

First of all, I received your "Christmas" letter more than any holiday greeting we received. I think of you often and have been concerned about the success of your consulting firm, about the health of your son, and how your dear Madeline is enjoying your new environment. I am happy that the answers to all of my concerns are just "wonderful". The growth of the Casazza & Panson firm in only four years, your son's physical condition which weighed so heavily on your family is indeed a blessing from above, and the fact that Madeline's holding and quieting you is a gift that only a dear wife can bestow.

You give me undue credit as the originator of our 500 kV system and other system projects, whereas in fact, my part merely was in responding to the imagination and technological abilities of you and your group of planners. I still believe that Public Service was, for many years, in the forefront of planning and implementation of large power systems. I still get a warm feeling

of pride in the achievements that you and your associates brought from idea to fact. It has been a great disappointment to me that later on relationships within the organization changed to the extent that you no longer felt that your aspirations could be fulfilled in Public Service and that you should make the change into the consulting field. The phenomenal increase in your Company's revenues bespeaks clearly the great capability that you brought to the firm.

My 1982 wish for you is that business will continue to grow and prosper, that you and son will remain in good health, and that Virginia and I may have the pleasure of a visit with you and Madeline here or in Washington during the year.

Sincerely
Ed Snyder

EDWIN H. SNYDER
25 TWOMBLY DRIVE
SUMMIT, N. J. 07901

November 10 1974

Dear Jack

I was greatly saddened to learn yesterday that your Mother had passed on several days ago. I know this is a great loss to you and your family because of your deep devotion to her as has been shown clearly in little remarks you have made concerning her in the years I have known you. I hope you are comforted in the knowledge that she lived to see you rise to top level in science and engineering in our Company and also in the electric power industry both here and abroad.

Virginia joins me in expressing our heartfelt sympathy to you and your family in this time of sorrow.

Sincerely,

Ed

P.S. - Regret I haven't had an opportunity to congratulate you on your recent important promotion. The company is indeed fortunate ^{to have} a man of your calibre in this important position. Sincere congratulations and good wishes to you — Ed

American Electric Power
Service Corporation
1 Riverside Plaza
Columbus, OH 43215

CSA, INC.

FEB 22 1990

AEP
AMERICAN
ELECTRIC
POWER

| | |
|-----|-------|
| SAC | SSG |
| AJS | LIL |
| RAW | ABM |
| PJP | NN |
| SRC | File: |
| HDI | MKT |
| LJW | REF |
| EAC | JOB |
| KLS | TOSS |

Mr. John A. Casazza, President
Casazza, Schultz & Associates, Inc.
1901 North Fort Myer Drive
Arlington, VA 22209-1610

February 16, 1990

Dear Jack:

W. S. White, Jr.
Chairman of the Board and
Chief Executive Officer
614 223 1500

Several weeks ago you sent me a copy of your "Testimony on the Relationship of our National Energy Strategy to our Nation's Security and Defense," and I was much interested in reading it. You know, of course, that we agree with you on the fundamentals of the power industry.

After I finished reading it I was reminded of another problem which our industry will face and that is the question of where we are going to get the equipment we will need when we start building power plants again in this country as we surely will have to in the not too distant future. As you know there are not many manufacturers left in the United States who make the equipment we will need. I am sending along a copy of a paper we prepared that was presented at a National Academy of Engineering meeting in December which I believe illustrates the problem. It is another reason for concern.

Jack, our industry is too vital and our problems too important to the well-being of all of us to be left to the theoretical economists who have no practical knowledge and who have a difficult time agreeing on anything. We should get the facts first before decisions are made, rather than trying to square the facts with the decisions after they have been made.

Best regards.

Sincerely,



WSW p
Enclosure

(PRIOR TO ARAB
OIL BOYCOTT) *for*

John A. Casazza
302 Passaic Avenue
Hansbrouck Heights, N. J. 07601
(201) 288-0788

January 8, 1973

Mr. Robert G. Hooke
Castine
Maine 04421

Dear Bob:

I appreciated very much receiving the thoughts expressed in your November 11, 1972 letter. As a result I have contacted the United Nations trying to obtain information on their activities in the energy area. I did this by writing a letter to the United States Representative in the UN, George Bush.

To my surprise, the US staff at the UN did not seem to know of any energy activities. This does not speak very well for the US staff representatives at the UN, -- to be unaware of world activities in an area of such great importance to the entire globe. |||

Every indication that I see is that western Europe, the United States and Japan, the "have" nations, will soon be competing furiously for the energy resources of the "have nots". The "have nots" sooner or later are going to react with great resentment. It seems to me that the keystone in some of the world's problems lies in the question of energy. Involved are such questions as the wise use of resources, the wise distribution of wealth, and the use of initiative to solve these problems.

I am continuing, through some European contacts and through further correspondence with Ambassador Bush, to see if I can't find out more about what is going on. I am not sure what good the efforts of one individual are in such situations, but I feel better for trying. After all, Public Service provides 1/40th of the energy provided by the utilities in the US, and the US use of energy is 1/3rd of that of the whole world. Perhaps the policies formed in an organization of our size can be of significance in this world-wide problem.

I have not yet had time to read the book you recommended, The Invisible Pyramid by Lauren Easley) but I

am making arrangements to get a copy of it to read now that the Christmas and holiday season and festivities are finished.

I hope all is well with you, Mrs. Hooke, and all the rest of your family.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jack".

JAC:PWE



*File
JAC Personal
- Subways*

John A. Casazza
Vice President
Planning and Research

Public Service Electric and Gas Company 80 Park Place Newark, N.J. 07101 201/622-7000

March 24, 1976

Mrs. Robert G. Hooke
Castine, Maine 04421

Dear Catherine,

After hearing of Bob's death I deliberately wanted to take some time, before writing to you, to reflect on Bob's contributions to me, to PSE&G, to Montclair, New Jersey, and to many others in the world.

As you know, I had the extreme good fortune to work for Bob at a very early stage in my career. During those first impressionable years, he stressed the importance of a community viewpoint in making our decisions. He emphasized the need to examine, not only the technical and cold, hard economic facts of the matter but also the effects on human beings. Frequently, as I proposed a plan to him, he would look out the window and ask: "What will be best for the people out there?"

Bob's philosophy and his approach so impressed a number of us here in PSE&G that we have carried on in later years the Robert Hooke traditions. I still look out the window today and ask some of my younger people: "What will be best for the people out there?" I think Bob would be very happy to know that his philosophy and training are not only being perpetuated but expanded. I think the world is better off because of him.

I know you will pass on to Bob's grandchildren, as they grow older, a true indication of the kind of man their Grandfather was and of the contributions he made so humbly and quietly. His ideas and beliefs will live long after him.

Attached is a modest check to be given in Bob's name to the First Congregational Society (Unitarian).

Sincerely,

JAC:VKM
Attach.



UNIVERSITY OF FLORIDA

College of Engineering
Department of Industrial and Systems Engineering

303 Weil Hall
PO Box 116595
Gainesville, FL 32611-6595
(352) 392-1464
Fax: (352) 392-3537
E-mail: isedept@ise.ufl.edu

October 27, 2006

Mr. John A Jack Casazza
8208 Donset Drive
Springfield, VA 22152

Dear Jack,

As I am nearing the end of my professional career, and I'm starting to write my memoirs, I have been seriously reflecting on the most important events and people in my life. You were certainly one of the people who positively influenced my life in several significant ways, and I want to formally acknowledge this help, and thank you for it.

It has taken me far too many years to fully appreciate what you and a number of others have done to help me achieve the success that I have enjoyed in my personal and professional life. I apologize for not having better recognized your help when it occurred, and I am sorry that I didn't get this letter written earlier. However, I am happy that I'm still able to let you know how much I do appreciate the many things that you did for me. And one of these things stands out far above the others!

We first met in Washington, DC in 1989 -90, the year I was on Sabbatical leave from the University of Florida. I was working at the Department of Energy for John Milhone, who had assigned me to help the Building Systems Division of DOE with their input to President George Bush Senior's National Energy Strategy. You were one of the IEEE Energy Committee Members who was presenting testimony to the Department of Energy regarding recommendations on National Energy Policy from the IEEE. We met after your presentation, and immediately recognized the value of working together on trying to improve the energy policy direction of the US. We met several times and talked about the value of engineers participating in public policy regarding technological issues. Shortly after that you asked the Chairman of the IEEE Energy Committee to invite me to participate on that Committee as an Advisory Member. That action led to me being a Member of the IEEE Energy Committee for the next several years.

I also met with you several times to discuss another project I was working on at the University of Florida, which was to develop a program for the College of Engineering called Leadership in Engineering. The purpose of this program was to establish a

formal training program for engineers that improved their skills to become leaders in business, industry and government. This program would help engineers develop their skills in writing, speaking, interpersonal relations, and sales that would help them succeed faster in reaching leadership positions in their companies and organizations. Too few of our large technological companies in the US had engineers as senior officers and CEOs. You were very supportive of my ideas, and were already trying to have a similar influence on your university, Cooper Union.

Over the next few years, we continued to work together and discuss ideas for both how to get engineers more involved in technological public policy, and how to get engineers better equipped to be leaders in their companies. You also got me involved in several consulting projects that you were doing for utilities, and I helped with analyzing and recommending energy efficiency and DSM activities. This work was at a time in my career when I was not making a very good salary at the University of Florida, so this work was rewarding not only technically, but also financially.

Around 1994, you contacted me and said you would like to nominate me for the status of IEEE Fellow. I was extremely flattered and pleased with this suggestion that I was qualified to join a very elite group of people in IEEE who were recognized by their peers for the high quality and important research and contributions to IEEE and to society. Your status as a Member of the IEEE Energy Committee and as a National IEEE Award Recipient impressed upon me the value you thought I had contributed with my work in the energy and energy policy area. With you as my Nominator, and with the support of five other IEEE Fellows who also supported my nomination, I thought there would be a reasonable chance for success. However, the nomination went through the IEEE Power Engineering Society, where it was not approved. Too much of my work had alienated electric utility representatives who did not appreciate my views of energy efficiency and equipment standards which would slow the need for new large power plants. It looked pretty certain that I would not get the approval of the IEEE PES to become a Fellow in any short period of time.

However, with your help, I was able to get the IEEE Committee on Social Implications of Technology to look at my nomination that you had made. This committee was much more receptive to the work I had done, and the accomplishments I had achieved – particularly my receipt of the American Association of Engineering Societies Palladium Medal in 1988. I was awarded this Medal for my work in helping to create new appliance efficiency standards for the US and for Florida. So this time, my nomination went to the IEEE Committee on Social Implications of Technology for review, and based on the strength of your nomination and support, I received the approval of this IEEE Committee, I succeeded in becoming an IEEE Fellow. For your help in initiating and supporting my nomination as an IEEE Fellow I am eternally grateful. Without your help and support, it is unlikely that I would be an IEEE Fellow today.

I was very fortunate to have met you and worked with you in the energy policy and engineering leadership areas. Your continued work in the energy policy area is an inspiration to me, and to many others. It has taken me a while to fully understand and appreciate the things you really did for me that made my life more successful and more enjoyable. I'm just sorry I did not get this thank you letter written earlier; but I'm glad it is not too late to get this to you.

Thank you, Jack!

Your friend always,

A handwritten signature in black ink, appearing to read "Barney", with a long, sweeping horizontal stroke extending to the right.

Barney L Capehart, PhD
Professor Emeritus
Department of Industrial and Systems Engineering
University of Florida
Gainesville, FL 32611
Capehart@ISE.UFL.EDU

JAN 31 1994

702 BIRD BAY DRIVE WEST • VENICE, FLORIDA 34292 • (813) 488-8252

94/1/25

Mr. J. A. Cosarza - Chmn.
CSA Energy Consultants
Arlington, Virginia

Dear Jack:

A belated thanks for the copy of your book on electric power transmission. Although I have not yet had an opportunity to read it all, I can say that I found it of considerable interest.

I noticed that the book is Vol 2nd of a series. Is this a separate series from the so-called Press books? I assume that (from the series title) it is not only Power. In fact, I see from the back cover that IEEE is very much in the book-publishing business (Incidentally, from the News release you included, I think the IEEE \$400 minimum handling charge would discourage people who want only one book, perhaps the table at the Annual Meetings take care of this.)

For the student particularly, this book should be not only inspiring but also very useful as a list of the varied kinds of problems and situations that he may face if he decides to go into the electric power field.

Finally, as a token I send you a copy of a talk I gave, with the same title as your book but rather different, at the 1976 Tesla Symposium. You may find it of some interest.

Thanks again Charles Concordia

(4/1/94)

19, March 2010

Dear Mr. Casazza:

The undersigned, Mr. Yoshihide Hase has been working for Dr. Sekine in the Study Group, as Secretary General, and on behalf of Dr. Sekine and the whole members of the Study Group, I am writing this report to you in accordance with Dr. Sekine's instruction. First of all, we wish to express our heartfelt gratitude to you for your favor and consideration extended to us over the past two years.

I am very pleased to inform you that we have just sold out almost all of the 4,000 copies of our book. We intended to publish the abridged version of your original book "Forgotten Roots" carefully preserving your essential theme and content as the first Part thereof together with the subsequent three relevant Parts that we believe can amplify your theme for Japanese readers in our own perspective.

We have received enough comments from the readers to feel confident that we can convey them to you as consensus feedback. First of all we must report that many a reader said they had been 'enlightened' by your advocacy and arguments regardless of differences in the social and industrial systems between the two countries.

Your book has no doubt given the Japanese readers a wide spectrum of deep impressions and suggestions; and we are now proud that our intent was successfully fulfilled. Excerpts of the readers' responses are as follows:

1. Book Reviews:

We have so far found three book reviews published as follows:

(1) Monthly "Energy Review" March 2010 Issue

This review was written by Mr. Junnichi Maruyama, editorial writer for the Daily Yomiuri Shimbun that is most read in Japan. He praises the book because it is written in such a way that people outside the electric power industry can understand the complicated issues clearly. He is impressed by your persuasive arguments and also amazed, among other things, by your right prediction of the collapse of the "Profit Now" type economy long before the Lehman failure happened. He concluded his article with his comment that he wishes to read Mr. Casazza's next book.

(2) Monthly "Energy Forum" December 2009 Issue

The commentator begins his introductory essay by referring to your message to the Japanese Readers and the key word "Profit Now". He points out the significance of the book because of your strong argument that the electric

engineers should be committed to social obligations.

(3) "Rakuyu Association Newsletter" January 1, 2010 Issue

This newsletter is circulated within the alumni association of Electric and Electronic Engineering Faculty of Kyoto University and the writer is Dr. Makoto Nagao, ex-President of the University and now General manager of the National Parliamentary Library. He introduces the book Part by Part and comments that it will give the electric engineers a variety of suggestions and targets that they should aimed at. We are encouraged that he picked up our book as his topics for this year.

2. Readers' comments on the Part I

We compressed your original "Forgotten Roots" from Act 1 to Curtain Call as faithfully as possible and we feel that responses from the readers have confirmed that our intent was successfully attained when we read some of them as follows:

- (1) "It is Mr. Casazza who for the first time in the most sophisticated way taught me the reason for and the background of the events and changes that happened in the electric power industry, manufacturing industry and universities in the U.S.A. during the past 50 years."
- (2) "Since the Lehman Shock, many books and commentators have discussed the evil and damage financial capitalism caused. Mr. Casazza pointed out it eroded the electric industry and the soul of the engineering profession as well. I want to pay deep respect to his clear insight and courageous willpower to assert over the years that neo-liberalism is the culprit of the deteriorating process."
- (3) "I have not known any other book that addresses the engineering profession and its public responsibility so forcibly. I was enlightened by this book on the social mission of the engineer, awareness of his or her role in the society, and importance of education."
- (4) "I was deeply impressed by Mr. Casazza's emotion, indignation and sorrow at the degradation of the society, industry and academics behind his thoughtful words. I can share the same value with him; pride, social awareness, patriotism that the engineer should maintain."

3. Readers' comments on the Part 2, Part 3 and Epilogue:

The Part 2 deals with history of the Japanese power industry over the past 120 years. Since there are scarce opportunities to learn it in a systematic manner, this Part seems to contribute as a good textbook for younger generations. One of remarkable comments is that the electric engineers in Japan as well should have participated in debates and other related processes on the liberalization of the electric industry; the writer of this comment apparently influenced by the Part 1.

The Part 3 discourses upon environmental issues, energy security and engineering education in the Japanese electric industry and universities in the timeframe of up to 2050. Many readers showed keen interest in the engineer's social responsibility and ethics; These opinions reflect correctly your main points as discussed in the Part 1.

The Epilogue addresses a world to come in the latter half of this century; from the low-carbon society to post-carbon society where electricity generated by non-carbon sources and transmitted over the trans-continental networks will play a vital role; This Part is designed to stimulate imagination of the younger generations and induce their interest in participating in the power industry and is in general well received as one that gives hints to young engineers in spite of its bold assumptions.

We once again reiterate our appreciation for your favor and generosity extended to us during the preparation for the publication in Japan. We look forward to an opportunity to read your new book with great interest.

Sincerely Yours,

Yoshihide Hase

Subj: Message of your Christmas Card
Date: 1/24/03 2:11:55 AM Eastern Standard Time
From: y.sekine@mt6.ttcn.ne.jp (Yasuji Sekine)
Reply-to: y.sekine@mt6.ttcn.ne.jp
To: Jackcasazza@aol.com

1/29/03
JAPAN

Dear Mr.Casazza:

I suppose that your wife and your family are doing well. The Christmas card you kindly sent to me was very impressive. Through my experience of participating in the government committee on power industry deregulation, which consists only of non-engineers except myself, I share the same feeling with you. If you agree, I wish to make your opinion widely known to the public, (specially to young engineers) through daily newspapers (in an abridged form) and some technical journals like the "Spectrum" of the IEEJ (Institute of Electrical Engineers of Japan). On that occasion, I think that it would be wise to mention briefly about your professional career and background, particularly in connection with the power industry deregulation in the United States.

I would be extremely happy if I could hear from you about my intention stated above.

Looking forward to hearing from you soon. Sincerely yours, Yasuji Sekine

----- Headers -----

Return-Path: <y.sekine@mt6.ttcn.ne.jp>
Received: from rly-x03.mx.aol.com (rly-x03.mail.aol.com [172.20.83.72]) by air-x03.mail.aol.com (v90.10) with ESMTP id MAILINXL34-0124021155; Fri, 24 Jan 2003 02:11:55 1900
Received: from mt6p.ttcn.ne.jp (mt6.ttcn.ne.jp [210.188.175.75]) by rly-x03.mx.aol.com (v90_r1.1) with ESMTP id MAILRELAYINXL32-0124021117; Fri, 24 Jan 2003 02:11:17 1900
Received: from vc2.ttcn.ne.jp ([211.1.103.129]) by mt6p.ttcn.ne.jp with ESMTP id <20030124071105.YGVS12437.mt6p@vc2.ttcn.ne.jp> for <Jackcasazza@aol.com>; Fri, 24 Jan 2003 16:11:05 +0900
Received: from fvc1-p.ttcn.ne.jp by vc2.ttcn.ne.jp (Scanmail) with ESMTP id 8F8C72EFD7 for <Jackcasazza@aol.com>; Fri, 24 Jan 2003 16:11:04 +0900 (JST)
Received: from [210.188.175.81] by fvc1-p.ttcn.ne.jp with SMTP id <20030124071104.SOZR9658.fvc1-p@[210.188.175.81]> for <Jackcasazza@aol.com>; Fri, 24 Jan 2003 16:11:04 +0900
From: Yasuji Sekine <y.sekine@mt6.ttcn.ne.jp>
Reply-To: y.sekine@mt6.ttcn.ne.jp
To: Jackcasazza@aol.com
Subject: Message of your Christmas Card
Date: Fri, 24 Jan 2003 16:11:04 +0900
MIME-Version: 1.0
Content-Type: text/plain; charset=iso-2022-jp
Content-Transfer-Encoding: 7bit
Message-Id: <20030124071104.SOZR9658.fvc1-p@[210.188.175.81]>

Subject: Sham? Shame!
Date: Mon, 3 Jun 2002 11:03:34 +0900
From: Yasuji Sekine <y.sekine@mx6.ttcn.ne.jp>
To: ameredinst@erols.com

Dear Mr. Casazza:
I am now sitting at my desk to read your book "Sham ? Shame !"
I am currently deeply involved in the work of the Power Market
Deregulation Committee of the Japanese Government. In this
circumstance, your book is extremely stimulating and informative. The
committee gives me a quite unique opportunity to exchange views with
people living and working outside the world I have been familiar with
for many years. It is surprising to see that only one (myself) out of
26 members of this committee is from engineering field.
Though I have not yet finished to read through your book, I wish to
congratulate you on your very remarkable work.
Looking forward to seeing you in the near future (probably in Paris),
With best regards, Sincerely yours, Yasuji Sekine

6/3/2002 7:15 AM

The Cooper Union for the Advancement of Science and Art, established in 1859, is a private institution of higher learning where all students receive full-tuition scholarships. Peter Cooper's legacy supports degree-granting programs in Art, Architecture and Engineering. The historic Great Hall is home to public forums, cultural events, and other community activities. The Cooper Union is located at Cooper Square, New York, New York 10003.

The phone number is (area code 212) 353-4285.
Fax No. 353-4341

Office of the Dean
Albert Nerken School of Engineering

March 13, 1990

Mr. John A. Casazza
President
Casazza, Schultz & Associates, Inc.
1901 North Fort Meyer Drive
Suite 503
Arlington, VA 22209

Dear John:

On behalf of the Cooper Union School of Engineering I would like to thank you for your generous donation of \$2,000. This money will be added to the \$18,000 you donated in 1989 to establish ways for encouraging engineers to become involved in governmental decision making processes.

The generosity of alumni such as you permits Cooper Union to undertake special projects which we could normally not consider.

This gift is really appreciated.

Very truly yours,



Dr. Eleanor Baum
Dean
School of Engineering

CSA, INC.
MAR 19 1990

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| JAC | _____ | SSG | _____ |
| AS | _____ | LIL | _____ |
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| KLS | _____ | TOSS | |

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The historic Great Hall is home to public forums, cultural events, and other community activities. The Cooper Union is located at Cooper Square, New York, New York 10003-7183.

Telephone [212] 353 4285 · Fax [212] 353 4341.

Office of the Dean
Albert Nerken School of Engineering

March 11, 1994

Book Editor
The New Yorker Magazine, Inc.
20 West 43rd Street
New York, NY 10036

Re: The Development of Electric Power Transmission

Dear Editor:

The 1992 Energy Policy Act. The Clean Air Act. New federal regulations. Recent court decisions. What do they have in common? They all impact an industry that has been a century in the making and is now experiencing a decade of momentous change.

The electric power industry is central to the prosperity and character of America as we know it. Enclosed for your review is a book on the development of that industry. I believe that this book is of interest and importance to the general public.

The basis of the book - and of the utility industry - is engineering technology and the building of an electricity delivery system that has been the model for the entire world.

The book chronicles the often turbulent history of the inner workings of the utility industry and the engineering profession. It explores potentially catastrophic events such as regional blackouts, oil embargoes, and environmental developments. Of great importance, it tells us why the coordinated development of our institutions and industries is essential.

The book is drawing attention worldwide because of the changing nature of the utility industry.

I urge you to review The Development of Electric Power Transmission, and publish your reaction.

Very truly yours,



Dr. Eleanor Baum
Dean of Engineering

John A. Casazza
8208 Donset Drive
Springfield, Virginia 22152

Was copy
sent to
per hands
with copy
of the
article

January 4, 1991

Father Ronald Saucchi, M.M.
Executive Editor
Maryknoll Magazine
Maryknoll, NY 10545

Dear Father Saucchi:

For many years I have been an admirer and financial contributor to *Maryknoll*. I believe the work you are doing throughout the world to help the poor is truly Christ's work--perhaps more than any other branch of the Catholic Church.

My reason for writing to you is to offer helpful information concerning your views about energy. The editorial by Father Hummert in the January, 1991 issue of *Maryknoll* is not only very misleading, but also lacks understanding of the relationship between energy and the plight of the poor in this world. Those of us who have been involved with trying to steer our nation's energy policy in the right direction, long ago learned of the need to establish balanced priorities between energy, economic welfare, and environmental policy. We need to fully consider the interrelated problems of food, shelter, health, and energy carefully.

I believe the highest priority should be given to human life and human welfare; this means preservation of clean air and clean water. I rank second factors such as survival of animal and aquatic species. Third would be considerations such as survival of plant species such as natural forests. And fourth would be concerns about visual factors such as undesirable appearance. The importance of human life ranks far above the survival of a forest. Father Hummert's editorial on energy is seriously flawed since it has failed to recognize this. It is particularly unfortunate that he presents his views in an issue of your magazine where you stress the plight of the poor and homeless in Hawaii. These people need energy. It has to be available to them at reasonable cost. The basic question is how can this best be done? Their problems, and the problems of the poor throughout the world, far outweigh survival of a small portion of a virgin forest.

Father Hummert is totally unrealistic when he suggests that this be done with solar power, wind power, etc. Is he aware of how little of mankind's energy supplies can be obtained from these sources? Perhaps less than a few percent of the world's total requirements. Is he aware of the cost and unpredictability of the energy obtained from these sources? Extreme and unrealistic positions such as those taken by Father Hummert are harmful to the poor of this world. I sincerely hope that Father Hummert is not preaching this sort of thing as a part of his mission on education. Misleading information can be worse than no information at all. I would be most happy to sit down with Father Hummert and provide him data, or help in any other way to make the truth available. *Maryknoll* needs to ensure that among all of the good things you do, you do not advocate energy policies which will be very harmful, particularly to the poor.

Page 2
Father Ronald Saucci, M.M.

I have attached an extra copy of this letter in the hopes you can forward it to Father Hummert.

Sincerely,

J.A. Casazza
Life Fellow - Institute of Electrical and Electronic Engineers
Member - Energy Engineering Board National Research Council

cc: Father Hummert

bcc: Jack Richardson

The Cathedral of St. Thomas More
3901 CATHEDRAL LANE
ARLINGTON, VIRGINIA 22203

February 13, 1994

Dear Ms. Casazza,

Thank you for your recent letter and the gift of the book you authored. I was particularly interested to see the sections you mentioned: of people who saw the importance of beliefs and philosophies influencing others for the good.

This fits in so well with the call to holiness for all people. You have recognized something of great importance by seeing the formative actions of the people you described. This is very much needed in our technological society.

I hope all is well with you and your family. I am well, but busy, between graduate studies in Canon Law and my tribunal work and weekend ministry. Be assured of my prayers.
In the Lord,
Fr. Lee Root