

Creating the IEEE Code of Ethics

The history behind the process...

By Emerson W. Pugh



Abstract

In 1912 the AIEE adopted its first code of ethics. It was called the “Code of Principles of Professional Conduct.” Following the 1963 merger of AIEE and IRE that formed IEEE, a new code of ethics was adopted in 1974 and revised in 1979 and again in 1987. In 1990 the IEEE Board of Directors voted to adopt a shorter code, with content and wording more appropriate for a worldwide membership.

Prior to the early 1900s, ethics were viewed as a personal matter and therefore not a responsibility of engineering societies. Among those seeking a change in this point of view was Schuyler S. Wheeler, president of the American Institute of Electrical Engineers (AIEE).

In 1906 he gave his presidential address on the subject of “Engineering Honor.” It was so enthusiastically received by the members that a committee (consisting of Schuyler P. Wheeler, H. W. Buck, and Charles P. Steinmetz) was established to begin work on creating an AIEE code of ethics.

Principles of Professional Conduct

It was not until six years later, in 1912, that a code of ethics was finally adopted. It was called the “Code of Principles of Professional Conduct” and was published in the December 1912 issue of the *Transactions of the American Institute of Electrical Engineers*. [See Figure 1]

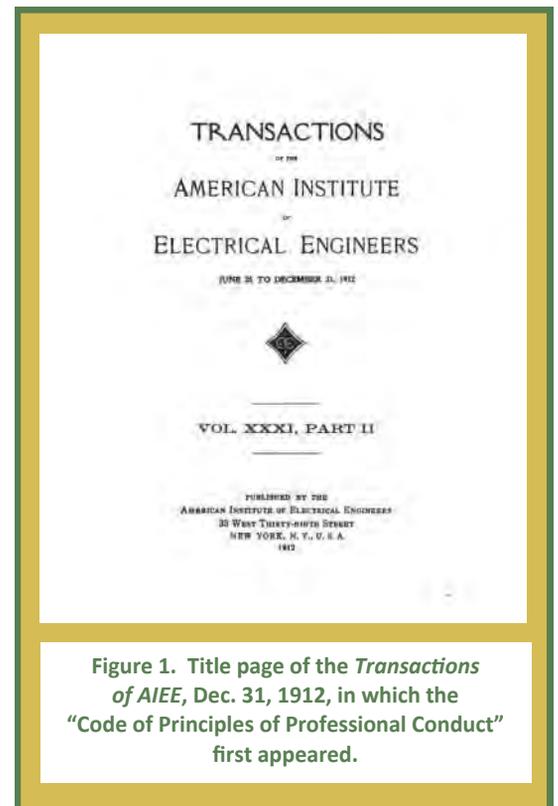


Figure 1. Title page of the *Transactions of AIEE*, Dec. 31, 1912, in which the “Code of Principles of Professional Conduct” first appeared.

It was a long document that filled three pages of the Transactions. The wording was quite specific and reflected the fact that many AIEE members were self-employed. Major topics of the Code were “General Principles,” “The Engineer’s Relations to Client or Employer,” “Ownership of Engineering Records and Data,” “The Engineer’s Relations to the Public,” and “The Engineer’s Relations to the Engineering Fraternity.” Associated with these five major topics were a total of 22 specific canons.

This “Code of Principles of Professional Conduct” provided ethical guidance for AIEE members until 1963 when AIEE and IRE (Institute of Radio Engineers) merged to form the IEEE (Institute of Electrical and Electronics Engineers).

In that same year, the Engineers Council for Professional Development (which had been founded in 1932 by seven engineering societies, including AIEE) revised and updated its “Canons of Ethics of Engineers,” and it asked its constituent societies to adopt them. Many engineering societies did adopt them.

IEEE Seeks Its Own Code

The IEEE chose to develop its own code of ethics. As an interim measure, it endorsed the three Fundamental Principles of Professional Engineering Ethics, which were stated in the Canons of the Engineers Council of Professional Development as follows: “The Engineer . . . (1) Will be honest and impartial, and will serve with devotion his employer, his clients, and the public; (2) Will strive to increase the competence and prestige of the engineering profession; and (3) Will use his knowledge and skill for the advancement of human welfare.”

It was not until December 1974 that a new volunteer-developed “IEEE Code of Ethics for Engineers” was approved by the IEEE Board of Directors, under the leadership of IEEE President John Guarrera. In early 1975 it was added to the IEEE Policy and Procedures Manual and also publicized in the *IEEE Spectrum* issue of February 1975. [See Figure 2]

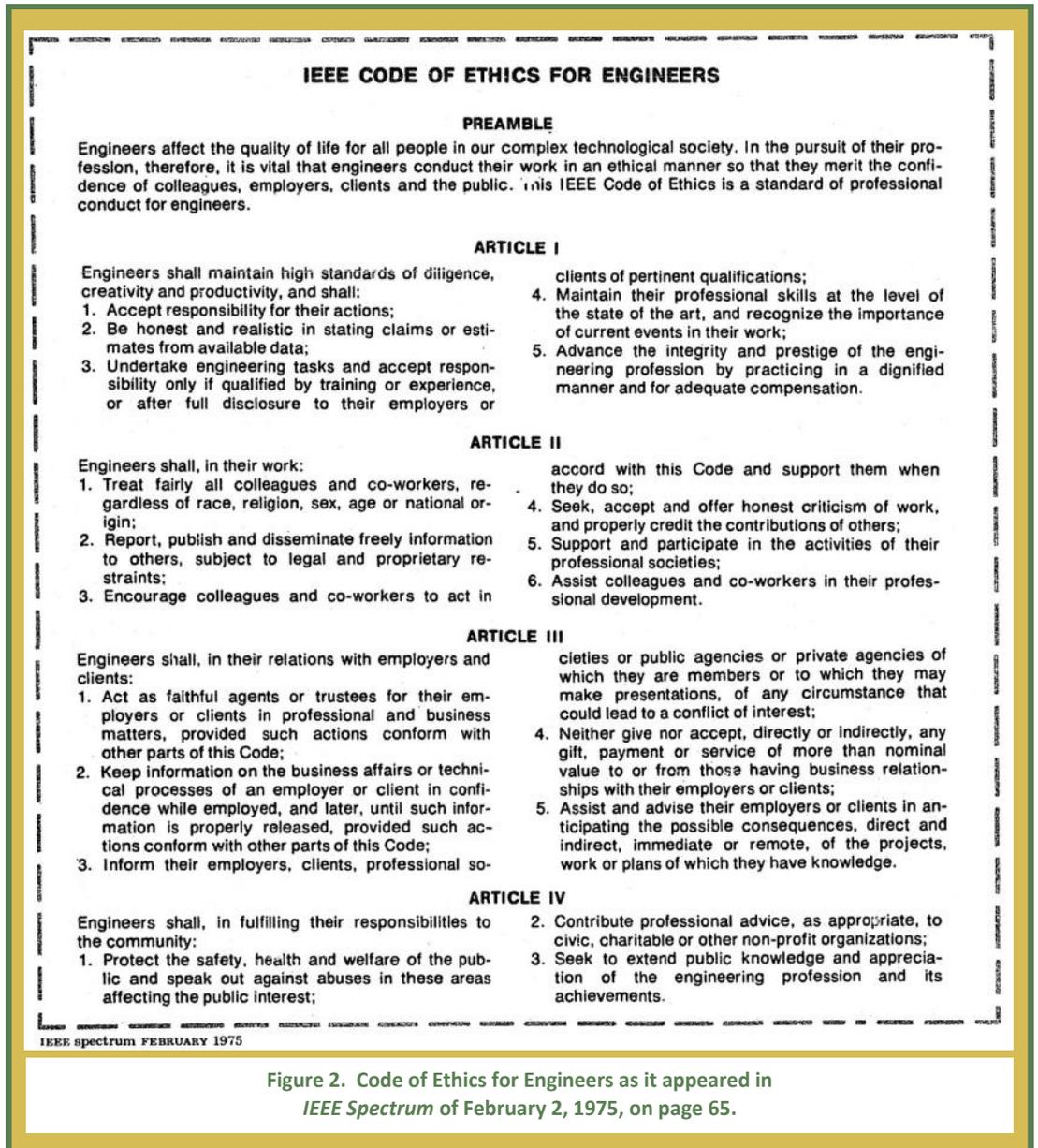


Figure 2. Code of Ethics for Engineers as it appeared in *IEEE Spectrum* of February 2, 1975, on page 65.

This “IEEE Code of Ethics for Engineers” had a brief preamble and four articles. The preamble said:

Engineers affect the quality of life for all people in our complex technological society. In the pursuit of their profession, therefore, it is vital that engineers conduct their work in an ethical manner so that they merit the confidence of

colleagues, employers, clients and the public. This IEEE Code of Ethics is a standard of professional conduct for engineers.

The articles that followed had a total of 19 canons that were divided among four areas of ethical concern for engineers: 1) maintaining their own capabilities, 2) behavior at work, 3) relations with employers and clients, and 4) responsibilities to the community.

As IEEE membership grew, many of the newer members were not trained as engineers, and they desired to be properly recognized for their own professional status. In response to this desire, the opening phrase of the first sentence of the Code's preamble was amended in February 1979. In the phrase, "Engineers affect the quality of life for all people," the single word, "Engineers," was replaced with "Engineers, scientists and technologists." The remainder of the Code's preamble and all four of its articles were amended to be consistent with this change.

Impact of a Dissident Member

The next change to the IEEE Code of Ethics was motivated by the activities of a dissident member of IEEE who portrayed himself as the "defender of working engineers," as distinguished from the volunteer leaders of IEEE, whom he characterized as "fat cats." In addition to attacking IEEE policies and activities in his newsletter, he personally attacked several IEEE volunteers in various ways, including writing damaging letters to their employers.

Finding there was nothing in the IEEE Code of Ethics that specifically forbid this type of behavior, the IEEE leadership corrected the omission in November 1987 by adding Article V, which is quoted below:

Members shall, in fulfilling their responsibilities to IEEE, its members, and employees:

1. Make no statement that the member knows to be false or with reckless disregard as to its truth or falsity concerning IEEE or the qualifications, integrity, professional reputation, or employment of another member or employee;
2. Neither injure nor attempt to injure, maliciously or falsely, the professional reputation or employment of another member or employee.

The "defender of working engineers" immediately charged IEEE leadership with taking this action without proper notification of the membership. In February 1988, IEEE President Russell C. Drew appointed an ad hoc committee to examine these charges, and to determine if any IEEE policies or procedures had been violated. The members of this ad hoc committee were Edward Bertnolli (chair), Dennis Bodson, Thomas Grim, and Emerson Pugh. We determined that the process by which the Code of Ethics had been revised in 1987 was legal and in keeping with the rules of IEEE. Nevertheless, we did recommend that all IEEE members be given an opportunity to review and comment on any future changes in the Code of Ethics before the Board voted on them.

Finding My Mission

Through my involvement on President Drew's ad hoc committee, I became interested in the possibility of rewriting the Code to make it shorter, loftier in style, and with content and wording more appropriate for IEEE members throughout the world. I was especially interested in this later goal because IEEE was growing more rapidly outside the United States than inside. By the end of 1987, 20 percent of IEEE's 293,129 members lived outside the United States. Also, I was IEEE President-Elect in 1988, and one of my goals was to increase the rate at which IEEE was becoming a transnational organization in its philosophies and governance as well as in the geographic distribution of its members.

By May 1988 I had written a first draft and had obtained support from the other three members of the ad hoc committee. The draft retained what I believed to be the major concepts of the then-current Code, but it was much shorter and had exactly ten canons. I liked the number ten because people throughout the world have ten fingers, they use a decimal system for counting, and many are accustomed to having a moral code specified by ten commandments.

I circulated this first draft to the members of the Ethics Committee of the IEEE United States Activities Board and to several other individuals. Most comments were supportive, but others expressed concern over the loss of the long-revered IEEE Code of Ethics.

PRESIDENT'S COLUMN

Must we give up ethics to eat?

Emerson W. Pugh



"I gave up ethics—to eat!" is the title of an article that originally appeared in the December 1957 issue of *Consulting Engineer*. The problem the author faced 30 years ago is no less real today. His solution, regretfully, is still just as common.

The author described how, as head of his own engineering firm, he had been unable to obtain government contracts without bribing public officials. Faced with either giving up his business or giving up his ethical principles, he chose the latter. He hired a "public relations counsel" who made the necessary arrangements for a percentage of each deal.

Those of us who are employed by large organizations are generally not confronted with this problem, but all of us have faced ethical dilemmas during our careers. Indeed, the complexities of the issues and decision processes may be greater for those employed by large organizations, where authority and responsibility are shared with others.

Fundamental to ethical dilemmas is the question: To whom do we owe our allegiance? To ourselves? Our family? An organization? Or to a larger community such as our country or the world? Being ethical generally implies acting in a manner beneficial to the larger rather than to the smaller group. Thus at its limit—and for the IEEE as a transnational organization—ethical behavior must be considered in the context of the world community.

But how are our ethical principles to be established? Can they be applicable worldwide? Who judges our behavior? How can ethics be enforced? Should ethical principles be discarded if they cannot be enforced or if many people violate them?

I do not have good answers for many of these questions. But our members seem to believe they know what ethics are, and that it is sometimes as important to adhere to ethical principles as it is to eat. Furthermore, when the IEEE Code of Ethics was revised in 1987, many individuals and groups expressed a desire to participate in that process. Many also expressed a desire to have a code of ethics with clear, simple wording.

Following up on these desires—and to begin a dialogue on ethics—I have attempted to simplify and clarify the IEEE Code of Ethics. I have done this by making use of suggestions submitted when the code was last revised and by seeking advice from many others. The resulting "simplified" version, printed below, no doubt also reflects some of my own views, which may or may not be held by other IEEE members or their colleagues.

Members who have thoughts on this subject that they wish to share should write to: IEEE President, Code of Ethics, 345 E. 47th Street, New York, N.Y. 10017, U.S.A. I may not be able to respond directly to everyone, but I have asked Edward C. Bertnoll, Vice President—Professional Activities, to establish a committee to review the responses to this column.

If there is enough interest and sense of direction in the correspondence, the committee will take appropriate action. For example, it may modify either the "simplified version" or the present version to provide a basis for further discussion and possible change, or it may conclude that some completely different action is needed. On the other hand, if there is little response, we shall report that to you and take no further action. The present IEEE Code of Ethics is displayed on p.11.

Simplified Code of Ethics

We the members of the IEEE—in recognition of the importance of our technologies to the quality of life throughout the world, and in accepting our obligations to our profession, its members, and the community we serve—agree and covenant:

1. to conduct ourselves in the highest ethical manner;
2. to make engineering decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public;
3. to avoid real or perceived conflicts of interest where possible, and to disclose them to affected parties when they do exist;
4. to help improve public understanding of technology and its proper use;
5. to maintain and improve our technical competency and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
6. to be honest and realistic in stating claims or estimates based on available data;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to neither offer nor accept bribes;
9. to treat fairly all persons regardless of race, religion, sex, age, or national origin, and never to attempt to injure maliciously or falsely the person, property, reputation, or employment of others;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

Figure 3. President's Column from *The Institute* of April 1989.

Some were concerned that the more general wording of the proposed code would make "enforcement" more difficult. The idea that IEEE should enforce its Code of Ethics was quite common at the time, and some even wanted to provide financial help to members who suffered financially by following the Code.

Taking Charge as President

On January 13, 1989, two weeks after becoming IEEE President, I held a meeting to discuss the IEEE Code of Ethics with a group of well-respected IEEE leaders. Based on these discussions, I made a number of minor changes and one major change to the proposed code of ethics.

The major change was to delete a provision that admonished IEEE members "to report, publish, and disseminate information freely to others, subject to legal and proprietary restraints" and replace it with one that admonished IEEE members "to neither offer nor accept bribes." Stephen H. Unger, especially, had urged that a statement against bribery be included, and I had concluded that the admonition to provide information

freely to others "subject to legal and proprietary restraints" would be interpreted so differently in countries throughout the world that it would have little real meaning. In the April 1989 issue of IEEE's newspaper, *The Institute*, I published the proposed IEEE Code of Ethics at the end of my "President's Column." [See Figure 3.]

The title I gave my "President's Column" was, "Must we give up ethics to eat?" This title was based on an article titled, "I gave up ethics to eat," which had been published in a 1957 issue of the magazine, *Consulting Engineer*. The

magazine article told how the author found he could not get government contracts without bribing government officials. In my column, I pointed out how this thirty-year-old story related to problems still faced by IEEE members and how important it was for IEEE to have a code of ethics that was easy to read and appropriate to IEEE members throughout the world.

I asked readers to compare the proposed simplified IEEE Code of Ethics at the bottom of my President's Column with the then-current Code, which was printed elsewhere in *The Institute*, and I asked them to send me their comments. Readers were also advised that I had "asked Edward C. Bertnolli, Vice President-Professional Activities, to establish a committee to review the responses." Subsequently, Robert Alden, William R. Middleton, William R. Tackaberry, and Stephen H. Unger were appointed to the committee.

Seeking Broad Support

From time to time during 1989, I met with this committee to consider a variety of changes that might make the Code more appealing to all members and also more likely to be approved by the IEEE Board of Directors. Of considerable concern was the strong disapproval of the proposed Code of Ethics by some IEEE volunteers who had spent many years working with the old version. Several of them believed a Code of Ethics should be written in precise legal language so that each provision could be enforced. At least one of them was known to be lobbying members of the Board of Directors to defeat the new Code of Ethics.

Also during my year as IEEE President, I discussed the proposed simplified Code of Ethics with IEEE members wherever I went. I was especially pleased that the provision on bribery was most strongly supported by members in countries where bribery was endemic. Previously, I had been concerned that members in such countries would reject the new Code of Ethics on the grounds that adhering to the provision on bribery was not realistic.

Proposed new Code of Ethics released by ad hoc committee

An *ad hoc* committee charged with simplifying the current version of the IEEE Code of Ethics has drafted a proposed replacement, reprinted below (left) along with the current version (right).

The new version, which the committee submitted to the Board of Directors in November, is now being distributed throughout the IEEE for members' review and comments. Formal discussion and consideration of the Simplified Code of Ethics is scheduled for the Board's August 1990 meeting. Before then, members are urged to read the rewritten code and send their opinions of it, pro or con, to President Carleton A. Bayless, IEEE, 345 E. 47th St., New York, N.Y. 10017.

The new Code is based on a version proposed by 1989 IEEE President Emerson W. Pugh in a President's Column in *THE INSTITUTE* [April 1989, p. 6] that was modified by members' responses to that column and the *ad hoc* committee's revisions. The committee, chaired by then Vice President-Professional Activities Edward C. Bertnolli, consisted of Robert Alden, William Middleton, William Tackaberry, and Steven Unger.

PROPOSED

We, the members of IEEE, in recognition of the importance of our technologies in improving the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to conduct of the highest ethical and professional order.

We further agree and covenant:

1. to make engineering decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to help improve understanding of technology and of its proper use;
4. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
5. to be honest and realistic in stating claims or estimates based on available data;
6. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
7. to neither offer nor accept bribes;
8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
9. to never maliciously or falsely attempt to injure the person, property, reputation, or employment of others;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

PRESENT

Preamble: Engineers, scientists and technologists affect the quality of life for all people in our complex technological society. In the pursuit of their profession, therefore, it is vital that IEEE members conduct their work in an ethical manner so that they merit the confidence of colleagues, employers, clients and the public. This IEEE Code of Ethics represents such a standard of professional conduct for IEEE members in the discharge of their responsibilities to employers, to clients, to the community and to their colleagues in this Institute and other professional societies. In order to protect and enhance the image and reputation of IEEE, its members, and the profession they represent, members must always conduct themselves in a manner reflecting the highest level of ethical conduct, honesty and openness.

Article I: Members shall maintain high standards of diligence, creativity and productivity, and shall: 1. Accept responsibility for their actions; 2. Be honest and realistic in stating claims or estimates from available data; 3. Undertake technological tasks and accept responsibility only if qualified by training or experience, or after full disclosure to their employers or clients of pertinent qualifications; 4. Maintain their professional skills at the level of the state of the art and recognize the importance of current events in their work; 5. Advance the integrity and prestige of the profession by practicing in a dignified manner and for adequate compensation.

Article II: Members shall, in their work: 1. Treat fairly all colleagues and co-workers, regardless of race, religion, sex, age or national origin; 2. Report, publish and disseminate freely information to others, subject to legal and proprietary restraints; 3. Encourage colleagues and co-workers to act in accord with this Code and support them when they do so; 4. Seek, accept and offer honest criticism of work, and properly credit the contribution of others; 5. Support and participate in the activities of their professional societies; 6. Assist colleagues and co-workers in their professional development.

Article III: Members shall, in their relations with employers and clients: 1. Act as faithful agents or trustees for their employers or clients in professional and business matters, provided such actions conform with other parts of this Code; 2. Keep information on the business affairs or technical processes of an employer or client in confidence while employed, and later, until such information is properly released, provided such actions conform with other parts of this Code; 3. Inform their employers, clients, professional societies or public agencies or private agencies of which they are members or to which they may make presentations, of any circumstances that could lead to a conflict of interest; 4. Neither give nor accept, directly or indirectly, any gift, payment or service of more than nominal value to or from those having business relationships with their employers or clients; 5. Assist and advise their employers or clients in anticipating the possible consequences, direct and indirect, immediate or remote, of the projects, work or plans of which they have knowledge.

Article IV: Members shall, in fulfilling their responsibilities to the community: 1. Protect the safety, health and welfare of the public and speak out against abuses in those areas affecting the public interest; 2. Contribute professional advice, as appropriate, to civic, charitable or other nonprofit organizations; 3. Seek to extend public knowledge and appreciation of the profession and its achievements.

Article V: Members shall, in fulfilling their responsibilities to IEEE, its members, and employees: 1. Make no statement that the member knows to be false or with reckless disregard as to its truth or falsity concerning IEEE or the qualifications, integrity, professional reputation, or employment of another member or employee; 2. Neither injure nor attempt to injure, maliciously or falsely, the professional reputation or employment of another member or employee.

Figure 4. The proposed new Code of Ethics and the old Code of Ethics published side-by-side in *The Institute* in February 1990.

However, these members said bribery was a serious problem that needed strong refutation. They believed that a code of ethics should record what people aspire to do rather than what they may actually do. Clearly they did not believe IEEE could, or should try to, enforce its Code of Ethics – except possibly in regard to internal IEEE matters.

In February 1990 the simplified Code of Ethics was again presented in *The Institute* for comment by all IEEE members. This time it was printed side-by-side with the old Code. The old Code of Ethics had 591 words, whereas the simplified Code had 238. This was a 60 percent reduction in the number of words. [See Figure 4.]

The comments received from members indicated that no significant changes were needed. Nevertheless I continued to work with the committee to achieve the best possible wording throughout the document. In August 1990 the IEEE Board of Directors approved the simplified IEEE Code of Ethics, which became effective on January 1, 1991.

Unlike the old Code of Ethics, this shorter version has been broadly distributed and read throughout the world. For example, it is prominently displayed in the “IEEE Society & Special Interest Memberships & Subscriptions” document that is updated each year.

A Minor Change

The Code of Ethics remained unchanged for 15 years, until 2006 when the word “engineering” was removed from the first canon. This canon had said, in part, that IEEE members were “to accept responsibility in making engineering decisions consistent with the safety, health, and welfare of the public.” With the word “engineering” deleted, they are now admonished, in effect, to “accept responsibility in making decisions (of all types) consistent with the safety, health, and welfare of the public.” [See Figure 5.]

This change was motivated in part by the IEEE Board of Directors approval in February 2004 of a revision to IEEE Bylaw 1-104 that opens membership to professionals who do not see themselves as engineers. Following this change in the Bylaws, the IEEE Ethics and Member Conduct Committee reviewed the IEEE Code of Ethics, consistent with its mandate to promote ethical behavior and to advise the Board of Directors on ethics policy and concerns.

Not surprisingly, the opportunity to review the document caused some Committee members to think of many things that might be reworded or expanded. Fortunately, however, with the wise guidance of Theodore A. Bickart, the Committee generally focused on the target issue. Ultimately, the Committee recommended that the word, engineering, be deleted in the first canon of the Code. Consistent with the recommendation of President Drew’s ad hoc committee of 1988, IEEE members, worldwide, were notified of this proposed change in the Code of Ethics by the Internet in November 2005 and then in the print edition of the Institute in December. The reaction of the membership was judged to be positive, and the Board of Directors approved the revision in February 2006.

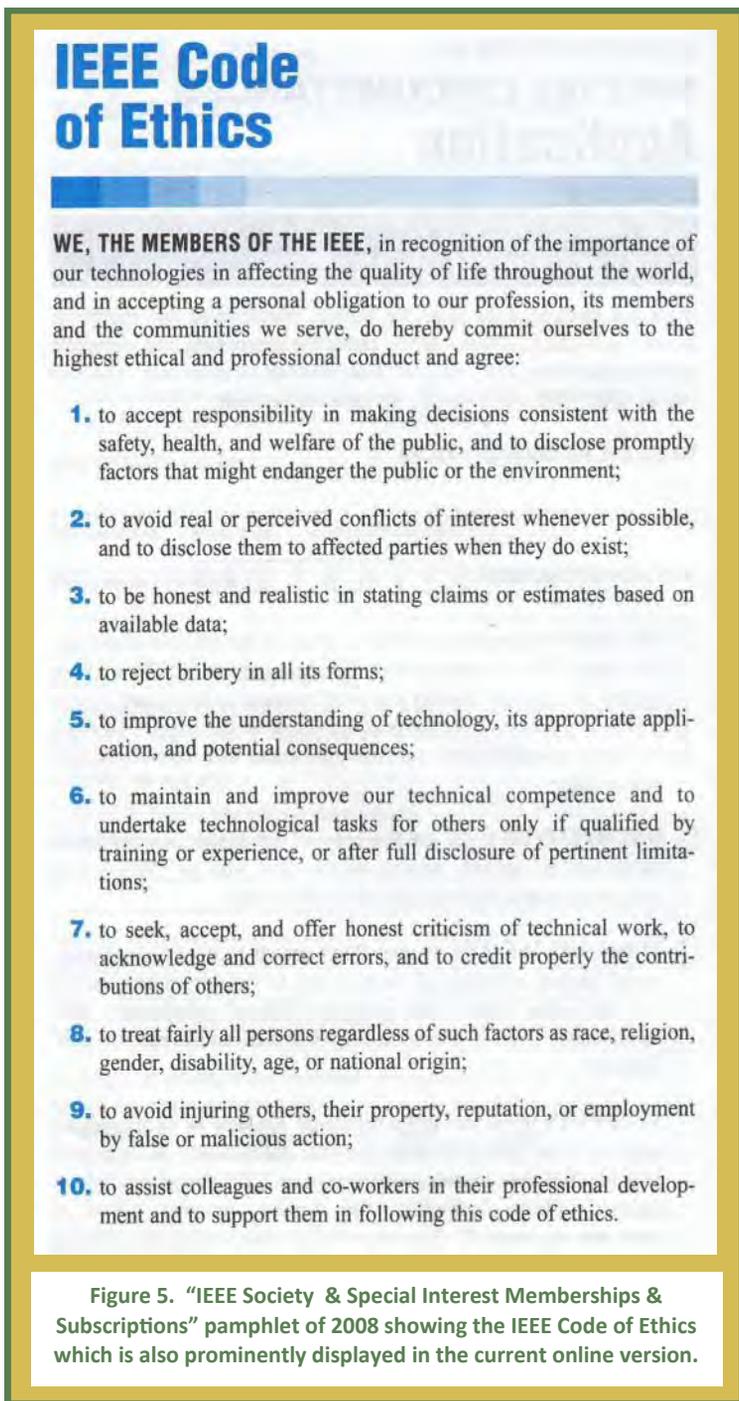


Figure 5. “IEEE Society & Special Interest Memberships & Subscriptions” pamphlet of 2008 showing the IEEE Code of Ethics which is also prominently displayed in the current online version.

From one perspective, it is surprising that any change was needed. After all, the Code of Ethics adopted in 1990 had been crafted to apply to members throughout the world – including those who did not consider themselves to be engineers. From another perspective, however, the use of the word, engineering, had been a troubling consideration even in 1990.

As we saw it then, if we failed to insert the word “engineering” it would have suggested that the IEEE Code of Ethics was being applied well beyond IEEE’s normal areas of interest – an unacceptable concept for many. However, using the word, engineering, might have been objectionable to others who did not consider themselves to be engineers.

In the environment of 1990, we ultimately inserted the word “engineering.” A major justification was our belief, that decisions made by scientists, engineers, or technologists, concerning the development or use of IEEE technologies in ways that could affect the “safety, health, and welfare of the public” were, by definition, “engineering” decisions.

By 2006 the environment had changed. No longer did it seem appropriate to limit the Code’s applicability to decisions normally defined as “engineering decisions” when the “safety, health, and welfare of the public” was at issue. When no suitable replacement for the word “engineering” could be found, it was simply deleted.

Worldwide Focus and Personal Commitment

The IEEE Code of Ethics adopted in 1990, and revised in 2006, necessarily has much in common with those of other technical societies, but it is unique in many ways. Perhaps most important, it puts less emphasis on a member’s responsibility to other members and greater emphasis on a member’s responsibility to all people. Indeed, the IEEE Code of Ethics is consistent with IEEE’s stated purpose of “fostering technological innovation and excellence for the benefit of humanity.” This statement is often shortened to the tagline, “IEEE: Advancing Technology for Humanity.”

IEEE members live in many countries, each with its own heritage, culture, and economy. By the end of 2012, 52 percent of IEEE’s 429,085 members were living in countries other than the United States. The decision of the IEEE Board of Directors in 1990 to replace the old IEEE Code of Ethics with one tailored to an international membership is now well justified. Because of where they live or because of personal circumstances, many IEEE members will find it difficult to adhere to all provisions of the IEEE Code of Ethics. Nevertheless, it is a Code to which all members can aspire, and that is a good thing.

The structure, brevity and clarity of the IEEE Code of Ethics are important, but probably the Code’s most obvious unique feature is the opening phrase: “We the members of the IEEE.” Many readers will recognize the similarity of this phrase to the opening phrase of the Constitution of the United States of America, which was adopted in 1787. I chose this opening phrase because it indicates a personal commitment to the IEEE Code of Ethics by each IEEE member.

Acknowledgements

This article is based on an earlier article, with the same title, that I wrote for the Conference Proceedings of the 2009 IEEE Conference on the History of Technical Societies. I am grateful to IEEE for allowing me to reuse so much of that material without change. In writing that article, I expressed my gratitude to Theodore A. Bickart (who chaired the IEEE Ethics and Member conduct Committee in 2006 and 2007) for many helpful discussions, and I also thanked Tamara A. Seeley who (as Tamara A. Walsh in her role as Administrator, Governance, IEEE Ethics Committee Staff Secretary) prepared a report in 2001 and an updated report in 2006 on the History of the IEEE Code of Ethics. Her reports are available through the office of the IEEE Ethics and Member Conduct Committee. I am once again indebted to these individuals for their help, and especially to Theodore A. Bickart who read and commented on this article.

About the Author:

Emerson W. Pugh has a Ph.D. in physics and worked for IBM for 36 years in various capacities, including research scientist, product development manager, and corporate executive. He is the author or coauthor of a college physics text book and four books on the history of IBM and the computer industry. He is a long-time volunteer for IEEE, having served most recently as president of IEEE in 1989, chair of the IEEE History Committee in 1996-1998, and president of the IEEE Foundation in 2000-2005. Currently he is chair of the IEEE STARS Program on the IEEE Global History Network.