

**Review of *Engineers for Change: Competing Visions of Technology in 1960s America*,  
Matthew Wisnioski**

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As one of the engineers mentioned in Professor's Wisnioski's book as actively advocating change, I have first-hand knowledge concerning many of the topics treated. Rather than discuss the book in its entirety, I will focus on what I am most familiar with, elaborating on, and updating, what the author has presented.

During the sixties and seventies, there were at least three general issues that motivated many engineers to make waves. The first was the Vietnam War, the cold war, and weapons of mass destruction. The second was growing concern over environmental issues, such as air and water pollution, and energy — particularly nuclear energy. The third involved all too many situations where the professional judgments of engineers on matters such as safety were overridden by managers, usually for short-term financial reasons.

My active involvement in this area began when, after about five years at Bell Laboratories, I joined the Columbia University EE (Electrical Engineering) Department faculty in the early sixties. At that time, there were a number of senior professors, in all departments of the SEAS (School of Engineering and Applied Science), who were interested in engineering ethics. Prominent examples were Victor Paschkis, Seymour Melman, and Mario Salvadori. We started an informal seminar to discuss what might be done to educate students in this area.

We decided to create an undergraduate technology and society (T&S) course, which would include an engineering ethics component. I wound up teaching this course, with occasional assistance, including guest lectures, from others (mainly Chemical Engineering professor Elmer Gaden). The course lasted from 1971 to 1981. The EE Department became EECS (Electrical Engineering and Computer Science). When the EECS Department later split and I went with the CS (Computer Science) Department segment, the course morphed into Computers and Society. More about this later. Our efforts to require all undergraduate engineering students to take a T&S course failed. By the mid-eighties, after the other members of our group had all retired or left Columbia, there was a meeting of the SEAS faculty to consider curriculum changes. My resolution to make T&S a required course received no support at all.

The Computers and Society course was last taught (by me) in 1996, after which, due to pressure to cover other courses for our greatly increased department enrollment, I was not permitted to teach it again. It has not been offered since, although a T&S course was taught once, a few years ago, by CS Professor Steven Bellovin. To my knowledge, no courses exist that deal with engineering or scientific ethics offered at Columbia University — other than a course on bioengineering ethics, which is an ABET (Accreditation Board for Engineering and Technology) requirement, for the SEAS undergraduate bioengineering program. All SEAS freshmen currently take a lecture

course, "the art of engineering", which includes one lecture on engineering ethics. CS Professor Gail Kaiser occasionally includes a lecture on an ethics related topic in one of her software courses. My practice was to include a twenty-minute engineering ethics talk at the end of the last lecture for each course that I taught. Many, perhaps most, other universities do a much better job in this area, some making courses with significant engineering ethics content requirements for engineering degrees.

Soon after becoming active in the areas of engineering ethics, and technology-society issues, I began to feel that simply theorizing and teaching students about engineering ethics issues, is not enough. It became clear that engineers who took ethics code provisions seriously were asking for trouble in the workplace. Whereas, with lawyers and physicians, ethics problems arise mainly from improper behavior of practitioners, engineering ethics issues most often concern efforts by engineers to resist pressure from management to cut corners in various ways.

It seemed wrong to encourage present and future engineers to behave in ways that are very likely to get them into trouble without also helping to develop effective mechanisms to defend them when they respond conscientiously. A basic factor is that the great majority of engineers are employees rather than private practitioners. Even those in the ranks of management are subject to the dictates of higher-level managers. These problems arise in universities, in government and in private industry. Individuals in conflict with even relatively small organizations are very likely to be trampled.

The most powerful mechanism for the defense of ethical engineers would be a trade union. But very few engineers ever joined unions, and, at present, the only engineering union I am aware of is the one at Boeing Aircraft. The professional societies that many engineers belong to are also potentially powerful allies of ethical engineers.

As described in *Engineers for Change*, a major effort was made to get the world's largest engineering society, the IEEE (Institute of Electrical and Electronics Engineers) to develop ethics support mechanisms. This started with the CSRE (Committee on Social Responsibility in Engineering) which, after a few years, morphed into the influential IEEE Committee on Social Implications of Technology (CSIT). (Around 1981, CSIT was promoted to become the IEEE Society on Social Implications of Technology [SSIT]).

A good start was made with the BART case (about 1973). CSIT got the IEEE to intervene with an amicus brief that reportedly led to a settlement. The IEEE then formed the Member Conduct Committee (MCC) to enforce its ethics code and to assist engineers whose adherence to the code got them into trouble. Very important support for all this came from Long Island based aero-space engineers such as Victor Zourides, operating via local IEEE entities. Sperry Rand engineer Frank Kotasek was an important CSRE and CSIT leader.

There was, however, strong resistance from management-oriented IEEE people who, not surprisingly, tended to attain high-level positions in the IEEE. After a good start, the

MCC was put in the hands of people hostile to the ethics support concept, and very few cases were processed. Then, in 1995, efforts led by Apple, and later, UC Berkeley, engineer Joe Wujek, working through the US Activities Board (now IEEE USA), and SSIT, resulted in the formation of a new IEEE Ethics Committee (EC), with a mandate to develop methods to support engineers trying to practice their profession ethically.

I was elected to the IEEE Board of Directors (BoD). Along with BoD (and SSIT) member Jerry Engel, who chaired the EC initially, I got the BoD to approve the launching of an ethics hotline to advise engineers with questions about ethical dilemmas, or in need of support because of pressure from employers, and the idea of an ethics support fund. We also got the IEEE ethics code distributed with the annual dues notice, and regular articles on ethics published in the IEEE news publication. A major success was getting another aerospace engineer, Walter Elden, appointed to the MCC. He single handedly revived this body, previously dedicated to inaction.

After we developed procedures acceptable to IEEE attorneys, the ethics hotline was launched. We worked out a plan for an ethics support fund, but here the attorneys blocked our efforts with a series of irrational arguments about imaginary dangers of lawsuits, and tax issues. Then, after the hotline operated successfully for a full year, with no problems for the IEEE, the entire ethics support operation was subjected to a devastating attack by the IEEE Executive Committee, featuring the abrupt termination of the hotline. The timing was probably related to the fact that both Jerry Engel and I were no longer on the BoD.

The principal justification for this was a spurious claim that ethics support activities exposed the IEEE to massive lawsuits. Without hearing arguments from the Ethics Committee (I had just been elected to a second term as chair), the IEEE EXCOM enacted a series of steps that effectively gutted IEEE ethics support efforts. The results are epitomized by the following IEEE bylaw, which is still in effect. "I-305.4. Neither the Ethics and Member Conduct Committee nor any of its members shall solicit or otherwise invite complaints, nor shall they provide advice to individuals." A more detailed account of this grisly episode, entitled "The Assault on IEEE Ethics Support", is accessible at <http://www1.cs.columbia.edu/~unger/articles/assault.html>

Although the IEEE still has an ethics committee, its only visible activity (that I am aware of) consists of student essay contests. The only current significant IEEE ethics support activity is the Carl Barus Award for Outstanding Service in the Public Interest, which is given every few years to engineers who stick their necks out in the course of the ethical practice of engineering. The most recent recipient, Mark Edwards, a civil engineer, fought (successfully) to get something done about lead in the Washington DC water supply. The award is given by SSIT and consists of a plaque and \$5000. The prior awardee was Mike DeKort, an electrical engineer, who called attention to seriously defective equipment made by his employer, Lockheed Martin, for the US Coast Guard. (Accounts of other cases can be found in my book, *Controlling Technology: Ethics and the Responsible Engineer*, 2nd Ed. Wiley, 1994.)

SSIT, apart from administering the Barus Award, is now a conventional scholarly organization. I believe that the last time SSIT played an advocacy role was in 2000, when we sent a letter to the US Attorney General protesting the maltreatment by the Justice Department of engineer Wen Ho Lee. (We were unable to persuade the IEEE President to endorse this act or to bring the matter to the IEEE BoD for endorsement.) SSIT membership is now about 2000. In 1987, the predecessor committee, a militant group, had over 4000 members.

It is possible that some other engineering societies are doing important things regarding ethics support, but I am not aware of any such activity. The National Society of Professional Engineers (NSPE) is the one I would have the most hope for, due to Arthur Schwartz, its General Counsel and Deputy Executive Director. He has, over the years, displayed real concern in this area, although I suspect he has not been able to get the NSPE to go as far as he would like it to.

The sad state of affairs with regard to engineering ethics support is largely due, in my opinion, to what seems to be an occupational reluctance of engineers to unite in their own interest. Apart from not rallying to get their professional society to back them up when they need help in situations involving ethics, American IEEE members have passively permitted IEEE USA to do next to nothing to try to stop the erosion of job opportunities resulting from the export of manufacturing, and the import of engineers under such programs as H-1B. I have heard it said that organizing engineers is like herding cats. This may simply reflect another aspect of the apparent inability of the great majority of Americans to organize themselves politically to defend themselves against the predatory elite that is dominating the country more and more every year.

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