Engineering Ethics

Engineers are often called on to make decisions about complex issues that do not have simple, clear choices. We are expected to make decisions or recommendations using our education, knowledge, and experience, in a way that is in the best interest of the public, our employer, and our profession. Engineers frequently work on projects that involve large financial investments and returns – and sometimes that can lead to decisions being made that are NOT in the best interest of all stakeholders.

This presentation reviews the ethical responsibilities of an engineer by discussing professional ethics and examples from industry where unethical behavior occurred. One of the best formats for discussing ethics comes from the group that administers the professional licensure exams, as well as the requirements for ethical conduct spelled out by Minnesota state law. Although these rules and laws are directed at P.E.'s, they provide guidance for everyone. The ethical codes of various professional engineering societies, including the IEEE, will be addressed. The session will end with any stories on ethical challenges that members of the audience are willing to share. It is arguably through such stories that the best ethics guidance occurs.

Biography of Tom Ferguson, P.E.

Tom Ferguson is an adjunct instructor in the University of Minnesota Duluth's Department of Electrical Engineering, and has been associated with the Department since its inception in the 1980's. Retiring after three decades' experience with engineering and executive management in the electric utility industry, he joined UMD in 2007 as a 3M McKnight Visiting Professor. The appointment significantly expanded the educational focus on conventional and alternative energy within UMD's engineering, freshman honors, and environmental science programs. In addition to developing and teaching new courses in these areas, Tom also developed a proposal for the establishment of a multidisciplinary center for energy on the UMD campus, one result of which was the creation of an energy minor that is available to all engineering majors. He also created several courses in antenna theory and design, and outfitted a well-equipped antennas laboratory. Although he is trying hard to retire, he continues to teach engineering courses to engineering seniors and graduate students.

Tom's professional career began in energy research and development, followed by engineering roles in telecommunications and energy management systems. As the Vice President of Power Delivery and Transmission at Minnesota Power, Tom oversaw professionals engaged in grid planning, engineering, operations, construction, maintenance, and regulatory policy. His career included extensive leadership roles in several regional, national and international power systems organizations, and he served as an advisor on electric grid issues to several U.S. senators. He was one of four utility executives in the state that created the CapX 2020 transmission initiative, an effort that today has resulted in the construction of approximately $2 billion in transmission upgrades. The mix of billions in capital, billions in energy transactions, deregulation of energy markets, and energy politics generated more than a few ethical challenges for Tom personally.

He holds Bachelor's and Master of Science degrees from the University of Minnesota-Twin Cities, graduated from the Carlson School of Management's Minnesota Executive Program, is a registered Professional Engineer, and an active amateur radio operator and experimenter. Tom and his wife Dorothy are lifelong residents of the Duluth area.

For several years, Tom has taught the ethics portion of the preparation course at UMD for the Fundamentals of Engineering exam. To Tom's knowledge, none of his past ethics course enrollees have been accused of unethical activity with Russia; perhaps the ethics presentation has been a factor. However, in the spirit of full disclosure,

Tom has himself talked with Russian radio operators hundreds of times. He hopes this fact will not taint the presentation he is about to deliver.