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**TAFT BROOME:** Line engineers. A line engineer is what you and I would call a practicing engineer. That term is used in distinction to management, who are people who were, at one time, line engineers for the most part. When I say management, I'm saying engineering management. OK.

And as you recall from the Challenger case, when this vice president took off his engineering hat and put on his management hat and changed the decision, there are different points of view and different professional responsibilities that line engineers have as opposed to engineering managers. And engineering managers have the greater authority, but there is definitely a difference in job requirement and, for this class, contract, and point of view. So the professional societies are largely line engineers. However, the leaderships of these professional societies ARE largely managers.

So the NSPE came along. They were young engineers. They were almost all line engineers. They were idealistic. And they wanted engineering to do all of the right things, even if it meant some bad things for their client or employer. And they set the mold with this code of ethics.

And in the '60s-- the late '60s-- when we had all of the social movements that led to the creation of the STS and then engineering ethics, that movement was sympathetic to the NSPE code, not to the ASE and the others. So eventually they all came as close to NSPE as they could get. So you'll find this difference between management and line engineer in the University, if you observe the faculty and administration, then the likenesses and the differences are going to be very much the same between line engineers and managers.

There's this book-- there were some books that were very scathing on the academy that came out in the '60s. One was called *The Professor Scam*, and there were a bunch of others. And one of them had, on the cover, that what are we talking about here when we say administration versus faculty. Thus was written for the general public. They're all the same.

**AUDIENCE:** In the eyes of the general public, you mean?

**TAFT BROOME:** That's what this person was trying to create it as a general public, and he had good reasons. He said, they're all the same so far as we're concerned. They all got PhDs. They were all faculty members, at least at one time.

What are you talking about? A college president can't get a presidency without having a full professorship in one of the academic departments at all places that I know of. So from the outside, what are you-- we're splitting hairs. And someone can say the same thing about engineering, the profession, that we're splitting hairs when you talk about engineering management versus engineers. And there is a gray area in the university, where it's hard for everybody to decide whether the department chairs or managers or faculty. It varies from institution the institution from time to time from Department to Department.

But there's this real gray area that's hard to deal with. And at many institutions a department chair has to be reviewed by the faculty every so often. If the review is bad, you're out. The department chair has to be reviewed by the dean every day. So the department chair is sort of an in-between case. And I'm certain that in all the places that I have worked-- not many, but-- we're talking about NASA, Nuclear Regulatory Commission, and the US Army Corps of Engineers, there is a position of responsibility that I liken to department chair. It's kind of hard to decide where they fit.

So the other important thing is to remember that I did say that the sentiments of the late '60s that brought STS, and thus engineering ethics into being, were on the side of NSPE and the line engineers. Because that's where you get mainly the whistle blowers from and all of that. Things could change. Things had changed, but that's where we are.

And the importance of NSPE is that most of the codes, I think it's fair to say, the lion's share of the codes, that are out that are enforced today use the NSP code as a starting point.

**AUDIENCE:** It's interesting we have this discussion. I actually found an article [INAUDIBLE], and one of the things you said in terms of the goals for code of ethics for the AAES is to get engineers involved and take an active role in [INAUDIBLE].

**TAFT BROOME:** Yeah.

**AUDIENCE:** It's interesting [INAUDIBLE] think about it until now, there really is a division between engineering management and line engineers.

**TAFT BROOME:** Yes.

**AUDIENCE:** And that both interests seem to be production and creative.

**TAFT BROOME:** That's right. That's right. That's right. And I don't know what word is best to describe the relationship between the two. It varies from, place to place, but you need to be aware that there is a line. And if you want to be vice president for engineering, you're going to have to go up through the management line, and you're going to have to deal with these people-- people that you were a part of. And they're going to have to deal with.

Also-- oh, there's another subtlety. And that is that once you decide to go the management root, it's very difficult to come back, because you lose those skills. A person who is not a professional is going to find what I'm about to say impossible to believe. You do not have to know more or even as much as the people know that you manage in order to manage them well.

And a good place to learn it is in the army. Second Lieutenant is 22 years old. Sergeant, 40 years old. Second Lieutenant doesn't know 1/10 of what the Sergeant knows, but the Lieutenant is not supposed to. The Lieutenant is supposed to know when the job is done right, and when it's wrong, and when to pass the order down from a high-- interface that unit with the higher unit.

But the Sergeant's supposed to do all this other stuff. And the Lieutenant tells the Sergeant what to do, and the Sergeant get the [INAUDIBLE]. Tell them what to do and do all of that. So you have to learn and appreciate that. Engineering is set up the same way, that you don't as much about putting steel and concrete as the steel workers do.

**AUDIENCE:** Right. The manager can't possibly know all of the fundamentals of all of it.

**TAFT BROOME:** Even If you did know--

**AUDIENCE:** [INAUDIBLE].

**TAFT BROOME:** Right. Even if you did know, even if you were a steel worker and now a manager, a couple of years down the line you're going to lose your competence even. Things are going to change, [INAUDIBLE]. So that's another thing you have to deal with. So let's see if we can't interrogate this code. How is it organized? Does it have a preamble? Does it have sections?

**AUDIENCE:** The NSPE seems to be the most compartmentalized.

**TAFT BROOME:** All right.

**AUDIENCE:** It has four distinct sections.

**TAFT BROOME:** What are they?

**AUDIENCE:** Preamble, which that's what engineering is as a profession, the fundamental canons. Which are pretty much repeated in all of the other codes, except maybe [INAUDIBLE].

**TAFT BROOME:** Yes. So there's fundamental canons, preamble fundamental canons, which are brief. Then the rules of practice are divided up according to each fundamental canon. And then professional obligations.

**TAFT BROOME:** OK.

**AUDIENCE:** And there's a lot of them.

**TAFT BROOME:** Well, the preamble-- let's read the preamble and then let's go through the canons. There are how many-- six and seven of them?

**AUDIENCE:** Six.

**TAFT BROOME:** Six. Let's go through the canons, and then let's pick out any of the other parts that we want to talk about. So somebody read the preamble, please.

**AUDIENCE:** Engineering is an1 important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

**TAFT BROOME:** OK. So there's a statement of what the profession is. It's subject to debate, but that's the statement that is authorized by this organization. All right. Do we have any problems with that statement? Yeah, we got problems with the statement.

Do we think that-- when I say we have problems, you comment any way you want. But I really want to know if you think that there's anything about that statement that should not be in a professional organization's preamble up to its code of ethics. Have they deceived anybody about the greatness of engineering?

**AUDIENCE:** Well, what strikes me when I read this is, wow, this is not something that all engineers either believe or are given the opportunity to believe, because it's not a definition [INAUDIBLE].

**TAFT BROOME:** Right.

**AUDIENCE:** That doesn't answer your question of whether or not [INAUDIBLE]. but--

**TAFT BROOME:** Well, it does.

**AUDIENCE:** Does their statement of what engineering is require that all engineers believe it?

**TAFT BROOME:** Oh, OK. I'm sorry. Is it rubbing up against this pen I think?

**AUDIENCE:** It's going like this.

**TAFT BROOME:** Oh.

[LAUGHTER]

OK. Thank you.

**AUDIENCE:** This actually makes me think of [INAUDIBLE]

**TAFT BROOME:** Yes.

**AUDIENCE:** In the army they give you a code, and they give you, you know, something, and it's almost like a moral reward. And so even if this isn't necessarily true, I think it probably belongs, because if you're entering this profession, it might be good to think about these ideals that maybe--

**TAFT BROOME:** Yeah.

**AUDIENCE:** --try to aspire to--

**AUDIENCE:** Yeah, I think the [INAUDIBLE].

**TAFT BROOME:** If there's anything wrong with it, it might be too idealistic and that it's all right to shoot after as a goal. Yeah, that's good. I think that's a good way to think about it. As to whether or not all the engineers buy into it, well, the question is, what is their decision-making method? I don't think that they use a plebiscite, where you go out and take the majority of everybody.

No, they get a committee.

**AUDIENCE:** Right. I mean, it's just that when you're a college engineering student, no one ever-- at the two universities that I've been at--

**TAFT BROOME:** Yeah.

**AUDIENCE:** No one says, [INAUDIBLE] engineers.

**TAFT BROOME:** Right.

**AUDIENCE:** Engineering has [INAUDIBLE].

[LAUGHTER]

And you're expected to [INAUDIBLE]. Now, I wish they would do that.

**TAFT BROOME:** Yes.

**AUDIENCE:** I wish that we would talk a lot more--

**TAFT BROOME:** Yes.

**AUDIENCE:** [INAUDIBLE] engineering [INAUDIBLE]. So anyway, I would be interested to know when professional engineers adopt this ideal about his profession. I don't know that most people who [INAUDIBLE] when I was in college. Maybe they have now, [INAUDIBLE]. I wonder what [INAUDIBLE].

[INTERPOSING VOICES]

Or is it-- I mean, for the people who wrote this happened.

**TAFT BROOME:** Well, there's another way to think about it. They've got it published. And if you don't like it, you don't have to join NSPE. Now, that's another way to think about it. It doesn't mean that you agree with it. But if you still want to join NSPE, you have to take responsibility for that statement some way or another. You did it with your eyes open-- it's published.

**AUDIENCE:** It's a really demanding statement--

**TAFT BROOME:** Yeah.

**AUDIENCE:** I think, to say that our [INAUDIBLE] are honesty, impartiality, fairness, and equity [INAUDIBLE]. Those are-- none of us ever live to all those things. I mean, humans fail. So--

**TAFT BROOME:** Well, the price you pay for that-- or not "the" price, but "a" price that you pay for that-- is if you go to court, the judge is going to take that position literally.

**AUDIENCE:** Yeah. Right. Yeah. [INAUDIBLE].

**TAFT BROOME:** The judge is going to say, here it is. It's published. I got a copy of it. Everybody's got a copy of it. Over here, I see where your application you asked to be a member. Nobody came down and said, you've got to be one or else we'll fire you. Nobody said that.

You've paid your dues every year for the last 10 years. You had time to change your mind after you got experience. But no, you kept your mouth shut. You've got to pay the price. You've got to live up to that.

So that's another way to think about this whole thing.

**AUDIENCE:** This is something that people can decide to subscribe to.

**TAFT BROOME:** Yeah, they decide to subscribe to it. And so, therefore, if they come before, let's say, a community group or a high school, a PTA, and they say, well, what do you stand for? What is engineering? Then you look like a liar if you don't say something like this, because you belong. You asked to belong-- free country, you don't have to belong.

All right. So there is the goal. Now, the fundamental canons are more or less-- the preamble is the end, and the fundamental canons are the means laid out in general terms. And we get specifics later. And the idea with the specifics is that when we review the code and decide to make changes or make additions, if we've done things right the preamble and the fundamental canons remain the same. We only change the rest of it-- the details.

In other words, there are something that's about our organization, one would say, who is a member, that has lasting value. And the preamble and the fundamental canons, if you're doing things right, have lasting value. And the details about how you carry it out may change from time to time. And another way to think about it is that the fundamental canons lay down your strategy, and the rules of practice and the last part are your tactics.

It all fits, right? Remember the basketball metaphor? Did we do that in this class? Yeah, we did it. The big guys can go for-- yeah. So the strategy for achieving this goal is laid down in your six fundamental canons, and your tactics are laid down in the rest of it.

Now, let's go through these canons. There's only six of them. Let's go through them one by one. Because as you said, we're going to find them elsewhere. What's the first one say?

**AUDIENCE:** Engineers [INAUDIBLE] professional [INAUDIBLE] hold paramount to the safety [INAUDIBLE].

**TAFT BROOME:** Now, whatever you do in this life, put an asterisk beside that statement. Because that is the fundamental point of controversy over engineering ethics in the 20th century. It is number one. I do not stand alone when using that superlative. It is the most debated, highest debated, issue, and the NSPE was the first one to come out early and say that responsibility for the public is more important than responsibility for the client and the employer. They were the first to jump out and say that.

And you can see that if an organization is controlled by managers, they were going to have problems with that statement. And a typical response from a management point of view is that there are competing interests that an engineer has to satisfy. One is the public, one is the client, and the other one's the employee.

And NSPE comes right out and uses this word paramount. OK. And by the way, Aarne Vesilind's last book-- latest-- he's got a new one I just heard. But let's say it this way, his latest book is entitled *Hold Paramount*.

So that means that now you have what is called a super principle, that principle, number one, is more overriding over the next five. And certainly the one I was in with the AAES, when I was in one with the AAES, I was very much aware of what the other ones were doing, because we would call each other-- all of that kind of stuff. I had to go out and give all of these speeches on behalf of my committee. And we all had the same problem.

And we worked, the AAES, when we get to it-- I just have a burning issue to say this right now-- we worked on that the thing for must have been about five years. And I was on the committee the last maybe three years of it, and I was chair of it the last two years of it. And we did not get a code of ethics until we passed this paramount rule. And then we had one.

The committee was not willing to submit anything--

**AUDIENCE:** [INAUDIBLE]?

**TAFT BROOME:** Well, until we resolved the issue among ourselves. It was fought that hard. And I'll tell you what happened. I'll tell you what happened there. This is open, I'll call it that.

There was a guy who was a manager named Bill Middleton. He was on the committee. And he was a very thoughtful person, and he was very strong on the side of balancing-- that's the term-- balancing competing interests for a long time. And then, I don't know who said-- it wasn't me-- but somebody said something in there that worked on his heart. I don't know what it was.

But he got on the train going back home to Philadelphia and he wrote up what he thought should be our fundamental canons. And he put a paramountcy rule in there. I don't think he used the word paramount, but he made it more paramount. And he sent it back to me, and said got it to him on the train.

When I got it, I put it in the code. And I called the president of the organization and said, we finished the code. I said, I have to tell you, I don't have the vote in writing. He said, we've been waiting on this thing for six years.

He said, will you take responsibility for it? I said, I will. I sent it up there and we had it. Nobody objected once it went in, because it came out of this man's heart. He found some correlation between what was in his unconscious and his conscience. And I said, when that thing comes out, everybody's going to buy it or a person who doesn't buy it is not going to fight against it.

**AUDIENCE:** So was the argument for not having a [INAUDIBLE] that you don't balance competing interests?

**TAFT BROOME:** Right.

**AUDIENCE:** So that was the basic idea.

**TAFT BROOME:** Yes. And it hurts business. And people argue. OK. And then you get into this whole thing about gray areas and complexity. And most of the issues weren't great and they weren't complex. But they really wanted a profession in which every member felt a deep sense of loyalty to whoever was putting the paycheck on the table. And if--

**AUDIENCE:** People who were advocating from not having paramountcy clause wanted that.

**TAFT BROOME:** Right. Right. Thought that you could not-- that the profession would break down because people would not be loyal to the ones they worked for. They saw themselves as serving the public, but not necessarily.

**TAFT BROOME:** Right. There was this question as to whether or not should serve the public, or whether it was somebody else's problem to serve the public, or whether you just needed to "balance," quote, unquote, these competing interests. And my position on there when it came to the word balance is you've got to have a rule for what establishes a balance.

And what is that rule? Nobody could give me the rule, because that goes back to a paramountcy. Something's got to be paramount. So if you use that word rule, what do you mean by balance? What constitutes a balance? Well, that confuse the issue for everybody enough for us to start thinking about the paramountcy rule.

**AUDIENCE:** While we're talking about the paramountcy clause, can we look at the alternative that the IEEE has?

**TAFT BROOME:** Yeah.

**AUDIENCE:** Because they don't use the paramount.

**TAFT BROOME:** Right.

**AUDIENCE:** Their first canon says to accept responsibility in making engineering decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public and the environment.

**TAFT BROOME:** Right.

**AUDIENCE:** So is that an alternative that you all were considering at AAES, something like that?

**TAFT BROOME:** No. The IEEE, well, let's say a few things about the IEEE. First of all, what they had to say back in those days was very important, because they were the largest engineering professional organization. And secondly, they were the largest partly because in those days the electrical engineering departments in colleges were the largest. Most of the students were in, most of the jobs were in, electrical engineering.

Now, that's shifted to computer science I believe-- computer engineering and computer science. But electrical was the biggest one. And lastly, IEEE was an international organization. It wasn't the Americans.

**AUDIENCE:** That's true.

**TAFT BROOME:** So they had to be concerned about international concerns. And all of that weighed in with them. So it looked for awhile as though IEEE was going to-- control is not the right word, dominate is the right word-- dominate everybody else. And it didn't work. So IEEE has stood by what they wrote all of these years, and they are just separate from the rest.

**AUDIENCE:** Yeah, it just seems like there's so much more gray area for what their first canon is. To accept responsibility in make decisions consistent with the public safety us so different than saying, hold paramount.

**TAFT BROOME:** Right.

**AUDIENCE:** What exactly does it mean to accept responsibility? Does that mean you could still make a bad decision and accept responsibility for it?

**TAFT BROOME:** Yeah. Well, there's one thing that is good about it that I take a lesson from. And that is that it presupposes that you can do engineering and not have to sacrifice your employer or client to do the right thing-- that they're always compatible. Now, the lesson that I take from that is that, well, I don't believe that they're always compatible. But what I do believe is that competency is almost always compatible.

I mean, if you're really good at what you do, you should be able to do it and do the right thing. Now, what I'm really after in that argument, to be quite honest and specific about it, is I am less concerned as to whether or not you can do both than I am concerned that to do one or the other is definitely incompetent. It builds into the culture that you're real smart if you can kill all of the enemy, and their babies, and their dogs, and everything, and say that, well, I had to do it.



Confidently you say, well, I'm just going to kill the soldiers, the ones that are armed. And not we're not going to hit the civilians. And I will be as effective as you are with that murder of everybody. So it builds in a culture-- going back to culture again-- what I call a bad culture.

So I think that we have the lay of the land. The IEEE is really trying to say something that I don't think everybody can believe, and that is that you can always do these things the right way. I think that it's the right-- in other words, here's what I would say-- now, emphasize I'm taking this stand. Now, you can take your stance, but I can justify my stance. I would take that statement and put it in the preamble as an ideal that we shoot for.

**AUDIENCE:** The whole canon are the idea that it is always possible to have done--

**TAFT BROOME:** The whole idea. I would take the canon out, I would put it up there as a first draft, and then I'd work on it until it all came out and made sense. OK. Can we go back to NSPE?

Hi, Tony. We're doing the NSPE code. What's the second canon? Are we done with the first?

**AUDIENCE:** Actually, I have a question. We've talked about or read about what welfare means.

**TAFT BROOME:** Yeah.

**AUDIENCE:** But how do the people who subscribe to this code of ethics-- how are they sure that they know what welfare means?

**TAFT BROOME:** That was a hotly debated word.

[LAUGHTER]

**AUDIENCE:** That's a word we really only use in normal conversation to talk about government programs.

**TAFT BROOME:** Right. Well, that was-- I was in a meeting when some engineers, three of them from the same state, got up and walked out of the meeting. Said if you can't find a substitute for that weird welfare, we're not going to even participate. Don't count us in it. They got up and walked out-- never came back. Because it had too many political connotations.

Now, the political connotation was that the government is-- I mean, this was the connotation that was applied to the word welfare in these discussions. The connotation was that the government is giving money to somebody not to work, and they can live just as well as I am, and I am working.

**AUDIENCE:** Right.

**TAFT BROOME:** Now, that was the nightmare in the American psyche that was built into the movements in the middle and late '60s. And the movement said that welfare was for people who either did not get their civil rights and therefore needed subsistence, or that you really don't want to have a country wherein people are suffering and have every reason to rise up against the country. I mean, no matter what your failure in life may be, you don't want your child to starve. And you will become a communist-- all of these other things.

So Branch Davidian, all of these groups that break out, are people who are sore about failure. And you don't want a country, particularly one-- that's what the argument went-- as profitable and as rich as ours to have that problem. So those were the two sides of it.

When they got it into these debates, frankly, I'll tell you, I just don't know why the people who use the word welfare were not going to yield on that point. I tried some other words. I couldn't find it. I didn't see where welfare was a necessary word.

**AUDIENCE:** And it is a loaded word.

**TAFT BROOME:** It was loaded.

**AUDIENCE:** You can say, let's just use the dictionary denotation of welfare--

**TAFT BROOME:** Yes.

**AUDIENCE:** Which is like, well being.

**TAFT BROOME:** Yeah.

**AUDIENCE:** More than that. But the fact of the matter is, most people think of the connotation of [INAUDIBLE].

**TAFT BROOME:** And the people who were dissatisfied with it at the time are still dissatisfied. They don't like that word. The good news is, the time has passed and we've got a whole generation out here, really doesn't know what that, doesn't feel those--

**AUDIENCE:** Doesn't have that negative connotation.

**TAFT BROOME:** They are happy to say, well, we'll look in the dictionary, OK. So the good news is, it no longer seems to me to make a difference. But it was loaded. And like I said, I like the word welfare, but I could find a substitute.

If that makes you mad, I'll find another one that means the same thing. And if that makes you mad, then I see there's no way for us to come to any conclusion. But I was willing to find a substitute. But the people who laid on that word welfare, bang their--

**AUDIENCE:** They just thought it was the only word that captured it.

**TAFT BROOME:** That's right. And they were going to do it. And it won, if you want to put it in terms of winning and losing. So yeah, that's a good term.

It was a loaded term in those days, loaded. But it came out. OK, where else are we now?

**AUDIENCE:** We're on number two now.

**TAFT BROOME:** Somebody read number two.

**AUDIENCE:** [? Kristen, ?] do you have a longer version? I have, performed services only in areas of incompetence.

**AUDIENCE:** That's what actually--

**TAFT BROOME:** Now, that was a contested one.

**AUDIENCE:** Yeah, I was wondering. That one, I thought a lot about that one also.

**TAFT BROOME:** Yes.

**AUDIENCE:** That was contested, really?

**TAFT BROOME:** Yes, hotly contested.

**AUDIENCE:** That you shouldn't constrain engineers to perform only in their competence?

**TAFT BROOME:** That's right. I'll tell you why. There was one guy, I can't remember his name or what organization he represented because in the AAES, everybody was a representative of one of the member organizations.

I can't remember what organization. But he put it very articulately and he fought very hard for it. Lost in the end, but he fought very--

His argument was that there are two kinds of engineering organizations, big ones and little ones. So if you got a small company out here, and say, the three of you all get together and say you're going to get incorporated. And you wind up hiring 20 people and you're making good money, all right?

Then something on the job, a fuse busts, and you have to fix that electrical wiring. You don't have the money to be going out to hire an electrical engineer to come in on the spot because you've got your critical pass schedule, you've got to finish this job today. Somebody's got to go to crawl down in there and fix that wire. So the idea was that requiring engineers to perform only in the areas of their competence was going to put the small business engineers out of business.

**AUDIENCE:** Does that happen? Or can small businesses find a way around the [INAUDIBLE].

**TAFT BROOME:** What happened I think in the end was the small business just kept doing what they were doing. And no big cases come up. And the basic attitude that we talked about when I was chair of the committee was that, look, judges and juries are reasonable at some level.

They're going to know that you're not a concrete foreman but you wanted to put just enough concrete in here to put an electrical apparatus that your company makes on top of. And nobody came in here on time. You got to do it.

So somebody said, well, let's go mix the concrete. I did it for my son's dog house. And you throw it in there. Some jury is going to be sympathetic to that.

And just don't let it get out of hand. Don't have a nuclear device and the product you make that goes bad and you try to fix it. Don't go crazy. So I think that what happened with that case was that cooler heads prevailed in the end.

**AUDIENCE:** I think that resolves some issues because at first glance, you equate being competent with being ethical. But that's not really what it's saying. It's saying it's unethical to force you to do something that you're not competent-- Like, it's not unethical to not know how to do something.

**TAFT BROOME:** No.

**AUDIENCE:** So maybe that's the idea that I played with more in my head.

**AUDIENCE:** You thought it was bad.

**AUDIENCE:** At first glance, I think we've had a conversation before about, I think it was Chernobyl we talked about it.

**TAFT BROOME:** Yeah, competency came up in Chernobyl.

**AUDIENCE:** So yeah, it was an important distinction to make. And it just made it clear for me that's what's going to happen, you attempt it, not necessarily that maybe you're not great at it and you tried and failed. Nothing ethically is wrong. There's just you actually tried and you know you're not qualified to do it.

**TAFT BROOME:** Well, that was one of the big issues that I brought to the table as a person who had studied ethics formally. But engineers had very strong sentiments that if you didn't know how to solve a certain kind of problem, you were unethical. And I tried to tell them, no, you got to separate that out. And in the end cooler heads prevailed on that one too.

But there was a basic sentiment among engineers that if there were certain things you didn't know, then you shouldn't be practicing. And it was unethical. And I'll tell you what made their arguments strong, if not entirely compelling. They would make a metaphor with physicians.

OK, so you're sitting up there. Your heart is going bad. You're about to die.

The physician comes in and says, well, I've never studied the heart. But I'm going to cut your heart out today anyway. I mean, part of it-- Now, there's something unethical and competency tied into that.

And then they make the metaphor back to engineering. And engineers start thinking. We have to hold it.

Maybe cooler heads will prevail in these situations. OK, but that was hot. That was a hot issue.

**AUDIENCE:** And if you're under time constraints, like you were saying, pouring the concrete. What are you going to do?

**TAFT BROOME:** Yeah. And we're not pouring concrete for a column that's going to sustain 30 stories of stuff on top. We just stuff a little thing over here. If it cracks, then we'll pay for it.

You try to work that-- Cooler heads prevail in the courtroom sometimes. Take your chances. But I think that underneath the surface, remember, I told you there are certain things operating underneath the surface of discussion that nobody would deny. And sometimes some of it has been written.

One is that engineers always felt and probably still feel that they are not accepted as professionals like doctors and lawyers are. And they're proud of their profession. And mainly, not because of the good things that are here in this preamble, but because actually what you had said, Miss [INAUDIBLE], a couple of classes ago. And that was, they know what it was like to be in school and take hard courses when everybody else could not pass these courses. And we not only had to pass them but do well in them in order to get a degree.

Under the surface in engineering, there is a little bit of bitterness about all of that. I know of one case where there was this professor who had something like 200 or 300 publications, was editor of three journals. Actually, the guy who told me he said it was four journals, and was a consultant.

How can they do all that?

**TAFT BROOME:** You want the answer? It's a term that has two words. It's called graduate students.

[LAUGHTER]

**TAFT BROOME:** Oh, and he's at the top of his profession. He had this one student that got a master's degree under him, just barely got through. And five or six, 10 years later, that particular former student gave a party at his house.

He had gone out and gotten a little business and became successful. And when the professor went to the party, the house was three times as big as the professor's house. He had a Rolls Royce and one of the four parking garages, had four full chimneys, the whole bit. And the story goes on about how this man began to drink and wound up in a home.

**AUDIENCE:** The professor?

**TAFT BROOME:** The professor. That just tore him up. So you get one story out. There was another story that hit the newspapers. I know about this story personally because this particular professor taught me a class in graduate school.

It turns out that this particular-- I won't call a name because in order to call the name, I have to get all my facts right. But the facts are not only on the record in the courts but in the newspapers. This was in AAUP, all kinds of stuff.

But this professor, turns out he was a very good teacher and had published some textbooks. I'm talking about Springer Verlag, top of the line textbooks, required reading at MIT, Stanford, Berkeley, Princeton, OK? But he did not have any research, none whatsoever, just a teacher. Then it came out that he was a full professor with tenure with a full-time appointment at three different universities simultaneously.

And he had his schedule made out so that at one place he had courses only Monday, Wednesday and Friday in the morning, and other places Monday, Wednesday and Friday in the afternoon, and then the one that was out of town in Pennsylvania, he was in Washington, was in Tuesday, Thursday. And they caught him and they roasted him on a spit. But there was a lot of sympathy for his case. A lot of other factors came in.

He had a daughter that was sick. And his wife was dead. Yeah, about all of these things. But there was one other factor that came in there that really worked on the academic profession very hard and that was, is this what a good teacher has to do in order just to pay bills and stuff?

Maybe we're doing too much to emphasize the research part of it. And so his case has never been forgotten. So underneath the surface, you have all of these currents.

**AUDIENCE:** Was the issue [INAUDIBLE]?

**TAFT BROOME:** The issue was that it was illegal, that you cannot-- The issue was that the president wanted to fire him. And there was a lot of debate on one side or the other as to whether or not a faculty member can have more than one job. And they pointed to this tradition of the one day a week consulting, that there's this understanding that when you take on a faculty position, you've got one day a week to do what you want.

And that usually means consulting or doing something that will enhance your abilities to do teaching and research. You're not going to the beach. But it's up to you to decide. It's that it's just an understanding that has been the case for many, many years.

And it has influence in the courts. Courts say, this is-- They'll get all of these college presidents and people get up and say, yeah, that's just understood. All right, so you're supposed to get that one day, but to go and have two other full-time jobs. And not only that, but when you take a job, there's some kind of form you sign about, are you employed someplace else? So they're talking about conflicts of interest.

And for example, here, I'm on this sabbatical. I'm asked to join the editorial board of this journal. They say, how should we list you, Howard or MIT? Well, I learned a long time ago that if you are on sabbatical from Howard to another institution, that year, you're at the other institution.

When you go back, then you go back on the other one. And the institution where you are on the sabbatical to will have some mean-spirited ideas if you don't give them a recognition and don't give them the prominent recognition. And they don't even like it if they say, MIT/Howard.

So my dean and I understand it. Oh, I tell you what even set him up one day. I published a paper and put down Duke University.

He said, wait, are you going to submit that for a raise? So, yeah, I said, well, it's got Duke University on there. I said yeah, a sabbatical from Howard University and here's my [INAUDIBLE].

So in other words, there are some lower-level issues that are not contested to have legal standing. And this particular one with this professor was on the cusp. What they did in the end was they just, all three universities fired him. But one of them gave him his retirement.

You know the term, skeletons in the closet, where you've got a family and there are little things that everybody knows about, but you don't want everybody else to know about? In the academic profession, he's a skeleton in our closet. We really don't want other people to know about his case.

The only thing about it that I am-- I suffered some bitterness over that. And I made one or two phone calls about it because I was a former student. And I was bitter that there just didn't seem to be interest among students that here is a teacher that quote unquote "just can't make it" in his life.

So anyway, but a whole lot of other issues got involved. And they were nasty. People just want to sweep it under the table.

But I think one thing they've done about that here at MIT is they have a rank called a teaching professor. I know that there's a person in ESD that's has a rank of teaching-- Yeah. No, it's called teaching professor. It's Chris Magee. No, no, he's called, professor of the professional practice of engineering.

**AUDIENCE:** Yeah.

**TAFT BROOME:** But there's another one that is, I think an ESD. Well, you all check that. You all check. But anyway, one way to get around that where at institutions that could afford to do it was to create teaching rank.

So you could have a person, distinguished professor for teaching at some place. And all they have to do is teach. And they can get their raises without submitting grants. But that's as far as they've gone with that kind of thing.

But I'm just trying to say that these things are not secret. You can document all of this. But it still operates below the level of what I call the collective unconscious, the collective consciousness.

Nobody really wants to talk about it. And underneath what they say and do, will be some of that dust. And you have that here with this code. OK, let's sweat it out. Let's finish these six and--

**AUDIENCE:** Number three is issue public statements only in an objective and truthful manner.

**TAFT BROOME:** I'll tell you what that was about. I'll tell you what that was about. All of a sudden, the ordinary engineer became someone that the big news media wanted to interview. And that was terrifying.

I mean, it's terrifying for a university. All of a sudden, some ordinary professor is on *Nightline* or is interviewed by the *New York Times*, stuff like that. And so they really struggled over who could speak for the company when there was a question of nuclear waste or something like that. What can a person say?

And the lawyers got involved in that, free speech. Not that they were defending it. But they were trying to tell the presidents, the CEOs of corporations that you cannot suppress these employees. Because then the employee will take you to court and win big time.

So what can you do? So that issue there was really the cover, ordinary people who now become celebrities. And some of them, let's face it, some of them get drunk with being a celebrity. You know what I mean?

**AUDIENCE:** Right.

**TAFT BROOME:** Look, I mean, let's think about it. The ordinary things, we've all been through this. I've been through it.

When the shuttle Challenger went down, Howard University has a TV station. So they had this call-in program. So they asked me to come in and take the calls.

Just before the calls come in, I'm sitting down and they got a make-up artist, all this. You can let that stuff go to your head. It was easy for me. I just did my job and went back to the Library of Congress.

But some people, stuff goes to their heads. And they start making life miserable for a lot of people unnecessarily. So there was a lot of that underneath the surface, that came to the surface.

What they did was, there's a term, I don't know if it's a term of art, but you're going to get it. And it's called wordsmithing. Everybody knew what we had to do. Everybody agreed what we had to do. It was, what words can we write down here?

And so that particular one turned out for-- I think it's fair to say, for people who are writing codes of ethics, to be a wordsmithing challenge, particularly to get a lawyer in there so that we didn't go over the line. But everybody agreed on the principle.

**AUDIENCE:** But it seems like the underlying aim of that principle is to present the company maybe in a more positive manner. So you can't get an employee and get on the news and say [INAUDIBLE].

**TAFT BROOME:** Right.

**AUDIENCE:** You could maybe like underline. It seems like that's not necessarily-- You could adhere to that and be truthful and maybe say some things that management might not like. And you are being objective and truthful.

**TAFT BROOME:** Right.

**AUDIENCE:** But maybe that is one of the underlying assumptions that management [INAUDIBLE] it puts them in a better light.

**TAFT BROOME:** Right, well definitely that's true. The way big organizations deal with that is not to come out and tell everybody that they have to say things that put the company in the best light. What they do is, you're just not going to make it up to management level unless you really feel that way.

So it becomes an honest-- So if you get a manager up there, the manager is not lying. The manager is the person who was chosen because he or she really feels that way, has that real outlook everybody believes and can portray it as something really something truthful and objective. Somebody who feels differently is just not going to make it along those lines.

And you hope, when I say you, I mean the CEO, hopes that somebody who is not in that line is not being interviewed and know the newspapers, know the structure. They to get one person to say the party line. They want to get another person to say something else. And they play it against each other. And it's hard to deal with.

What happens in the end, I think, is that if you have to do anything like that, and I've learned from experience, is just to say that you are not a spokesman for your corporation. You are an engineer there. And you are speaking from the perspective of an engineer there. And this is my perspective and my outlook and my experience.

But you don't drag-- You don't take credit for saying, well, at my company, we-- Don't make statements like that. Somebody else could do it. But you can't do it. OK, how many more have we got?

**AUDIENCE:** Three.

**TAFT BROOME:** Three? Let's knock them out.

**AUDIENCE:** Number four, acts for each employer or client as faithful agent or trustees.

**TAFT BROOME:** Yes, what is a faithful agent? We got that from the lawyers.

**AUDIENCE:** So in the specifics, under rules of practice, it talks about disclosing known or potential conflicts of interest.

**TAFT BROOME:** Right.

**AUDIENCE:** Not accepting compensation from more than one party for services on the same thing, not soliciting or accepting the financial consideration from outside agents.

**TAFT BROOME:** Right. So those are the particulars on this issue of faithful agency. So when you go to a-- You might go to a contractor and say, I need another wing put on my house. You want to believe that the contractor has your interest in paramount first.

And that the person is not saying, well the real estate agency thinks that the market in this neighborhood will be higher if we don't have a whole lot of extensions put on these homes. I don't know why they would say that. But I'm making up a case.

And so they go to this meeting with the contractors and say, well, look, it's not in our interest having all of these things. So what the contractor does is come back, let's say, and says, well, quotes you the highest prices on everything, try to discourage you from doing it. We don't want that.



The contractors will say, no matter what, the other interests are, I am your agent. And if you want this thing put on, here are the prices. These are the best prices.

And you don't need to have steel put in as a column for a one-story extension of your kitchen. We can do that with a 4 by 4 piece of wood. But you got to get a good piece of wood, hardwood. So this is the kind you get. Save yourself \$2,000 or \$3,000.

So they don't want you playing those kinds of games. They want the client or whoever you're working for-- A good example is with the legal profession. A lot of them believe they're going to be agents for their client.

So I mean, you could be notorious killer. If you're supposed to defend that client, guess what you're supposed to do? Do your best to defend that client. What's next?

**AUDIENCE:** Avoid deceptive acts, which I think ties into it.

**TAFT BROOME:** Yeah,

**AUDIENCE:** [INAUDIBLE]

**TAFT BROOME:** Is that what we would call an easy one? Give us some specifics. What are one or two specifics?

**AUDIENCE:** Engineers should not falsify their qualifications.

[LAUGHTER]

**TAFT BROOME:** Oh.

**AUDIENCE:** Or permit misrepresentation of their associates' qualifications.

**TAFT BROOME:** We had a case at Howard where a faculty member in engineering-- Oh, this was a terrible case for other reasons. If you want to know them, we've got time to go. But what he did was he submitted credentials of 200 publications.

Had them nicely set down. And he came in from another university. And the department gave him full professorship, full professor with tenure.

**AUDIENCE:** Based on his presentation of those 200 publications?

**TAFT BROOME:** Yeah, made 99%. There was some question as to why he never made full any of his previous places. But that is usually answered by the real problem of the real case that maybe he just didn't fit in.

So I can think of some very talented professors that will not fit in at Howard. So we brought the professor down. Well, he did something else that was totally irrelevant to that that everybody wanted to fire him for.

So the department is building up a case against him. So they go back through his resume. What they found out was that almost all of his publications were what you call commentaries.

So you publish an article that comes out. And then many journals will allow a certain period of time, like a year, calendar year, for the rest of us to say, well, I think that the equation 3.2 in her report was incorrect. It left out the square term. You put it the squared term and send it back. And they publish it right along.

He had 200 commentary papers. And we felt deceived. We had made a contract with Mephistopheles. We thought that he should have put in--

Now, I may do commentary papers. But what I put all of the credentials down in for the commentary, I have a square bracket at the end that says commentary paper. Oh, actually what I do in my resume, I think you should look at my resume. I got commentary paper, I think, right up after the title. But I make sure that it's commentary paper.

Now, what I do to give a little bit of credit for myself is that the commentary papers I've written were what they call invited commentators. The editor will send me the copy of the paper and say, look, we need a commentary on it. I'm not sitting there saying, oh, I think this equation 3.2 is wrong. Not that I wouldn't. It just has not happened for me in my career to do that.

So I will put "invited commentary" down there to give it a little more status. There's nothing wrong with that. So that's a deception that, this was an engineer. So I'm looking at it as not just academic profession, but as engineering. This guy deceived us as we were engineering colleagues.

**AUDIENCE:** Another one's that's interesting on here is, engineers shall advise their clients or employers when they believe that a project will not be successful. I thought was interesting one. And it goes back to the managing engineer. But it is the engineer's job to say, this is going to work, [INAUDIBLE].

**TAFT BROOME:** Yeah.

**AUDIENCE:** Is that under the deceptive acts one, do you know? I'm just curious so I can find it.

**TAFT BROOME:** It's also a scary situation to be in, isn't it?

**AUDIENCE:** But I think it's a good one.

**AUDIENCE:** Do you have any more?

**AUDIENCE:** Oh, I see. It's under professional obligation.

**TAFT BROOME:** So read it, please.

**AUDIENCE:** Well, OK, so the sixth canon, well--

**AUDIENCE:** [? Chris, ?] that could be really awful. That's way out of order.

**AUDIENCE:** So we just did the fifth canon which is, avoid deceptive acts. And then the sixth canon is, conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

**TAFT BROOME:** Yeah, I always had an objection to that. I don't have any obligation to enhance the profession.

**AUDIENCE:** You don't think so?

**TAFT BROOME:** No, I don't think so. Certainly no moral obligation.

**AUDIENCE:** It seems like the whole section professional obligation pertains to that canon. And what you just brought up is under professional obligations. So it says, engineers shall advise their clients or employers when they believe a project would not be successful.

**TAFT BROOME:** OK, well, let me mention this. That I stand almost alone in this when it comes to enhancing the profession. I don't believe that I have any obligation. But I have been overruled.

**AUDIENCE:** What's the argument, then?

**TAFT BROOME:** OK, I was thinking of a metaphor. Let me just put the argument down. If a profession is going to be honorable, it has to be honorable without our making it honorable. Well, I shouldn't have to do anything other than the minimum to make it honorable.

Going beyond and saying, I have some respect for the honor of the profession, that's circular. If the profession is honorable, it's got to earn it. I shouldn't have to go around and do something extra to make it honorable. And so it should be honorable because of what it is.

**AUDIENCE:** All the things that came before, following all of those things, should maintain the honor of the profession.

**TAFT BROOME:** Make it honorable, right. I shouldn't have to go outside of that to enhance the honor. Because if you say that engineering is honorable, then I should only have to do engineering and it will be honorable. Then you have deceived me if I have to do more than that to make it honorable. All right, so I stand firm on my position. But I'm the only one out there saying this.

**AUDIENCE:** I guess I think maybe that enhancing the honor and enhancing public reputation, and enhancing it, not just maintaining it, is more something that belongs in a recommendation, a request, letter to colleagues.

**TAFT BROOME:** Yeah.

**AUDIENCE:** Instead of a code of ethics you have to sign.

**TAFT BROOME:** A code of ethics should be the minimum.

**AUDIENCE:** Yeah.

**TAFT BROOME:** And the minimum should be good enough. And anything that I do above the minimum is my business, but not an obligation. All of these words in ethics, duty, obligation, they're talking about minimums. If you go beyond that, that's good. But I don't have to go beyond it.

**AUDIENCE:** But a lot of people feel like it belongs in the fundamental canons.

**TAFT BROOME:** Yes, but I was overruled everywhere. OK we've got two more minutes. I think that you've already picked up that the other codes of ethics do not differ substantially, or if they do, it's mainly by abbreviation of this code.

The AAES code is unique in as much as it stands, it's called model, guide, or code. And it tries to get some kind of coherence among all of the professional societies that belong to the AAES. Individuals don't belong.

**AUDIENCE:** So does that mean that the AAES code does not obligate anyone, like it's just a model?

**TAFT BROOME:** It's just a model. But the reason for it is that engineers were advised by high-level people in Congress that engineering does not have a force in Congress like the AMA has because the AMA can speak for the whole profession. And engineering, you got 10, 12 different organizations saying different things.

So if you believe that engineering should have some force among congressional people, should have a lobbying dimension, then try to make your code as consistent with the AAES model code as you can. And that gets us closer to that. Other than that, you're free to do whatever you want.

OK, so we're going to have a special event coming up Friday for those of us who want to go. I want to go. I'll be there. And give us a little five-minute on Tuesday.

**AUDIENCE:** Do we need to prepare anything for Tuesday?

**TAFT BROOME:** I hadn't thought about it.

**AUDIENCE:** Will you email us if--

**TAFT BROOME:** If I think of something on Sunday night, that'll be too late.

**AUDIENCE:** Is there anything you want us to read?

**TAFT BROOME:** No, actually, unless I get a brilliant idea, and I think my brain is not ready for any brilliant ideas right now. Unless I get a brilliant idea, I'll just close out the discussion with codes of ethics and professionalism.

**AUDIENCE:** Can we talk about just, in general, the basics of ethics because it's nice to just take principles, codes, [INAUDIBLE]. But I think there's probably some arguments that can be made using the example of the professor who, again, violated various aspects of a certain code but didn't really do anything so horrible and so wrong.

**TAFT BROOME:** By all means. Bring it up. Oh, I've got some stuff to say on that.

You know me by now. I got something to say. OK, Thank you.