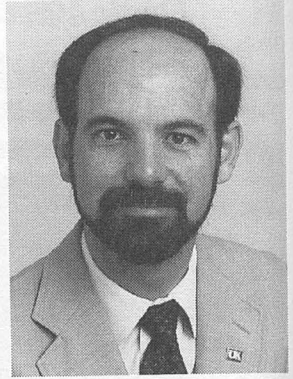


Dr. Thomas W. Lester has served as dean of the University of Kentucky Engineering College since July 1990. He came to UK from Louisiana State University where he was professor and chairman of the Department of Mechanical Engineering. Dr. Lester also was professor of nuclear engineering at Kansas State University.

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OPENING GENERAL SESSION Monday, October 2, 1995

Dr. Thomas W. Lester, Dean
UK College of Engineering

WELCOME AND REMARKS

I want to congratulate Calvin Grayson and Secretary Kelly for coming up with the theme for the conference this year. Let me tell you why I think this is important to you as participants in this conference. Many of you have seen the movie *Apollo 13*. If you have not, I encourage you to do so. *Apollo 13* happened in April 1970. I remember it well because I was finishing my bachelor's degree in mechanical engineering at Purdue University. If you saw the movie, you noticed they were using a peculiar-looking instrument to convert data from the command module computer to the lunar module computer that handled the trajectory for the mission to the moon and back. They were using slide rules. That was because Hewlett Packard had not come out with the first hand-held calculator, the HP 35, until the fall of 1970 or the spring of 1971. That gives you an idea of how crude the technology was when we went to the moon. In fact, the Apollo command module had less computing power than the average automobile on the road today.

Another thing happened in 1971 that was to be a harbinger of what is driving change. Intel came out with a microprocessor chip that performed, at that time, the remarkable number of 60,000 operations per second. The most current Pentium chip that Intel is marketing will produce something in the order of 219 million operations per second. Compare that to 60,000 operations per second just 25 years ago. Word has it that Intel has already developed a chip that will outrun the

current Pentium by a factor of three. They are waiting to market it, quite frankly, because they are trying to wring as much profit from the Pentium as they possibly can.

We have gone from the HP 35 calculator that had one storage register to a compact disc that is comparable to a whole library. The compact disc will handle 330,000 pages of information—that is a stack of papers fifty feet high. But, that is not where we are stopping. Compact discs are already being developed that have twenty times that capacity. Those may be on the market by the turn of the century. This means that your desktop, personal computer with a compact disc can have an information base that is equivalent to all the information that is currently in the Lexington Public Library.

We are faced with a situation where, as engineers or professionals in the transportation field, we are going to have the power and information at our desktop to do work on behalf of the transportation community that would have boggled the minds of the most farsighted engineers or scientists as near back as 25 years ago.

What does all of this have to do with transportation? A lot of this technology is already seeping into the transportation field. Witness what is going on with Advantage I-75, which is arguably the most successful and highly visible demonstration project in the United States in terms of turning Intelligent Transportation Systems into a reality. We already have intelligent systems in cars in terms of air bags—and those are going to become even more intelligent. An article I read over the weekend stated that within four years, air bags are going to be able to detect whether or not the occupant is belted in place and, thereby, will be able to manage the force of the deploying air bag. Air-bag systems will be able to detect whether it is an adult or child sitting in the seat, and can effectively change the magnitude of deployment force and direction of deployment. It will be able to detect whether you have a rear-facing or a front-facing child-restraint seat and thereby change the way it deploys or whether it is even deployed in the event of an accident.

We are working on tires that contain on-line systems that will be able to give you a continuous readout on your dashboard of the pressure in all four tires. Michelin will market, on the 1996 Lincoln Continental, a tire that is a "run-flat" spare that can run at highway speeds with zero air pressure for fifty miles. The technology is advancing very, very quickly in the transportation sector, and it is going to be a challenge for all of us to maintain our professional competency and our professional ability to keep up.

Actually, your situation is not too different from many manufacturers. If Secretary Kelly wanted to do a benchmarking with world-class organizations, he would find out right now that Motorola and other world-class companies demand that their engineers spend five percent of their time during the year in professional development. That is one day out of twenty. However, Motorola foresees a time by the turn of the

century when engineers from Motorola will have to spend 20 percent of their time on professional development. That is one day out of every week. The reason they will have to do that is because if we want to retain engineering jobs in this country, we have to be so much more productive than anyone else in the world. With the information revolution and the Internet, we can export engineering jobs just like we can export manufacturing jobs. I would say that it is not too farfetched to say in the transportation arena that we could export many of the engineering jobs in this state to the third-world countries because engineers in the third world countries will work for ten cents on the dollar compared to engineers here.

The bottom line is that we are going to have to retain a tremendous competitive advantage in our engineering work force in this country if we are going to retain engineering jobs. And, I think this also incorporates the transportation arena. That is why I can't think of a more appropriate theme for this year's conference than the one you have chosen. I think there are tremendous challenges facing all of you.

I am tremendously proud of the job that the Kentucky Transportation Center, the graduates of the College of Engineering, and the Transportation Cabinet have done with this state. I think you are up to the challenge of maintaining your competency in changing times. We, at the University of Kentucky, view one of our principle missions as a land-grant college to help you retain that competency. We have a new chancellor who will be working with the President of the University. Our new chancellor has chaired the Technology Transfer Commission of the National Association of State Universities and Land Grant Colleges. She is very, very interested in the role of the Center and what it is doing for the state. I think that you will see an enhanced effort by the University of Kentucky in the years ahead to assist those of you in the profession to serve the people of this state in the best possible fashion. I wish all of you great success in this conference and in the upcoming year professionally as you continue to serve the citizens of the Commonwealth. Thank you.