

STATEMENT OF
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(beginning June 1, 2004)
and
EXECUTIVE DIRECTOR
THE INSTITUTE FOR ENGINEERING EDUCATION
AT SOUTHERN METHODIST UNIVERISTY
BEFORE THE
COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON LABOR-HHS-EDUCATION
U.S. HOUSE OF REPRESENTATIVES
REGARDING
FEDERAL FUNDING REQUEST FOR
TEXAS ENGINEERING AND TECHNICAL CONSORTIUM (TETC)

MARCH 23, 2004

Thank you very much Representative Sessions for your generous introduction. All of us in Texas appreciate the hard work you do for the country. Your commitment to maintaining America's strength, both in terms of our economic and national security, is critical and we applaud you for your efforts.

Mr. Chairman and Members of the Subcommittee, I am very grateful to be able to offer testimony on the importance of maintaining our global economic leadership position through a wise and sustained investment in engineering education. And, I want to share with you the early success of a program called the Texas Engineering and Technical Consortium that has emerged as a national model for increasing the technical capabilities of our workforce.

As you know, engineering and technology is an important engine of our national economy. The innovations created by our working engineers have fueled the information revolution, increased our national security, brought more efficient health care, and created a larger food supply to the world.

Our remarkable engineering successes have been the product of our talented and highly skilled technical workforce. Unfortunately, recent national trends don't bode well for increasing the number of homegrown high-tech workers. A 2003 national survey¹ showed that the level of interest in engineering majors by college bound high school seniors has declined by 37% over the last twelve years. Sadly, this is a uniquely American phenomenon; much of the rest of world understands how important an engineering and technical workforce will be to their long-term economic health. Within the decade, some predict that India and China together could graduate nearly one million engineers per year, a number twenty times greater than the production of engineers here in the U.S.

The recently released Hart-Rudman report for the U.S. Commission on the National Security/21st Century says

"The harsh fact is that the U.S. need for the highest quality human capital in science, mathematics, and engineering is not being met."²

Why is this important to both Texas and the nation?

Engineering and technology have been drivers of the Texas and national economy for nearly one hundred years. With the discovery of oil at Spindletop by Austrian born engineer Francis Lucas to the kick-start of the high tech industry by Jack Kilby's invention of the integrated circuit in Dallas, Texas engineers have had a profound and historic impact for both our state's and nation's economy. And today, Texas is a major hub for engineering innovation - employing nearly half a million high tech and engineering workers, with annual wages of \$36 billion, while exporting \$29 billion in goods and services.

Yet today, this important and large industry is being replenished by only 4,500 new college graduates in engineering and computer scientists each year. This reality will impact all of us. For example, over the next decade, the Joint Strike Fighter program based at Lockheed Martin in Ft. Worth, expects to hire twice as many engineers each year than the entire state produces. This workforce imbalance is bad for Texas and bad for our nation. Our only hope for maintaining global leadership in engineering innovation

¹ "Maintaining a Strong Engineering Workforce," ACT Policy Report, authors R. Noeth, T. Cruce, and M. Harmston, 2003.

² Road Map for National Security: Imperative for Change, The Phase III Report of the US Commission on the National Security/21st Century, pp. 30, February 15, 2001.

is to invest today in the education of the best, most diverse, population of engineers in the world.

A Call to Action: Continue investing in successful programs like the Texas Engineering and Technical Consortium

Fortunately, I am happy to report that the Texas Engineering and Technical Consortium, which you supported in last year's budget at \$3 million, is beginning to pay real dividends. This innovative effort, aimed at doubling the number of engineers and computer scientists graduating from our universities, is already having a significant impact.

In fact, The Infinity Project, one program funded by TETC that I direct, is having a profound effect on national engineering education at the high school level – a key barrier to college success. This award winning engineering curricula has increased high school students' interest in engineering by 40-fold in schools that offer the program. And there are other great examples as well.

The wise investments of the state and federal government, along with high-technology companies of Advanced Micro Devices (AMD), Applied Materials, Hewlett-Packard, Intel, International SEMATECH, Lockheed Martin, Motorola, National Instruments, National Semiconductor, Sabre, and Texas Instruments is changing how Texas universities identify, recruit, educate, and mentor tomorrow's engineers. Through these efforts, TETC is establishing a national model for other states to follow as they address their own workforce needs.

But I am here to tell you that our work has really just begun. As a nation, we have struggled for decades to attract a diverse set of well-prepared students to the exciting world of engineering, math, and science. Permanent solutions to this problem have been elusive – and further still, programs that have shown promise often don't get the sustained funding necessary to have a real impact.

Therefore, on behalf of the 34 Texas universities and industry leaders participating in TETC, I ask that you continue investing in the Texas Engineering and Technical Consortium.

The program is sound and successful. I ask you to help make our progress sustainable.

Conclusion

I want to thank Chairman Regula, Members of the Subcommittee and Rep. Sessions once again for inviting me to testify on this important issue. On behalf of all of us across this nation who care deeply about the economic health of our country, I appreciate your interest in improving the quantity, quality, and diversity of America's technical workforce. With that, I am happy to answer any questions you may have.

Geoffrey C. Orsak, Ph.D.

Geoffrey C. Orsak is one of this nation's key leaders in engineering education and its impact on economic development and global competitiveness.

In his current role as Executive Director of the federally funded Institute for Engineering Education at SMU, he has founded and created a number of nationally recognized programs, including The Infinity Project and *Visioneering*, that today reach millions of students across our country with innovative engineering curricula and educational experiences. He also serves as Associate Dean for Research and Development and Professor of Electrical Engineering in the School of Engineering at SMU.

Beginning June 1, 2004, Dr. Orsak will assume his new position as Dean of Engineering for the SMU School of Engineering.

An expert in communications and signal processing, he has been the lead researcher on more than 25 projects funded by federal, state, and local grants totaling more than \$7 million. Dr. Orsak just recently completed service on a National Academy of Engineering blue ribbon panel evaluating the Marine Corps' science and technology programs and has in the past served as a DoD Science and Engineering Advisor through his participation on the Defense Science Study Group, a program sponsored by the Institute for Defense Analyses that introduces outstanding scientists and engineers to challenges facing national security.

Dr. Orsak serves on a number of international, national, and state boards including the IEEE Educational Activities Board, the Executive Committee of the Texas Engineering and Technical Consortium, Advisory Committee of the Technology Leadership Academy at the Texas Association of School Administrators, Advisory Committee of the Technology Business Council of the Greater Dallas Chamber of Commerce, Advisory Committee of Texas State Board of Educator Certification, Advisory Committee of the DFW Semiconductor Executive Committee, and on the Dallas Assembly.

Dr. Orsak received his B.S.E.E., M.E.E., and Ph.D. degrees in Electrical and Computer Engineering from Rice University.

Federal Funding Disclosure Statement

Geoffrey C. Orsak is serving as Principal Investigator on the following active federal grants.

Dept. of Education	Establishing Engineering Education in Early College and High School 2/04 – 12/06, \$550,000
Dept. of Education	Establishing The Institute for Engineering Education at SMU 5/1/02 – 9/30/03, \$800,000 (With S. Szygenda)
NSF	Rewarding Achievement and Promoting Success: Strategic Support to Foster Tomorrow's Diverse Engineers, 10/03 – 9/07, \$385,000 (With B. Willis)